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AGRICULTURAL GEOGRAPHY:

1) **Johnston:** 'Agricultural geography has been defined as the study of spatial variations in agricultural activity, involving both the description of such variations and attempt explain them.'

2) **Hillman:** 'Agricultural geography as the study of regional variation in agriculture and the factors responsible for them.'

3) **Reed:** 'Agricultural geography deals with the description and explanation of regional differentiation of agricultural characteristics'

4) **Symon:** defines agricultural geography as man's husbandary of the land.

5) **Bernard:** 'defines agricultural geography deals with the description and explaination of regional variations in agricultural and the factors responsible for them'.

* **Objectives of Agricultural Geography:**

(i) To examine the spatial distribution of crops, livestock and other agricultural activities.

(ii) To ascertain the spatial concentration of agricultural phenomena.

(iii) Crop association and crop-livestock combination change in space and time.

(iv) The performance of various crops in a country or region is not uniform.

(v) The cause of existing agricultural backwardness, and then to suggest suitable strategies to enhance productivity.

(vi) In the developed and in some pocket of developing countries, agriculture has achived the status of 'agribusiness'.

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Concept and Techniques of Delimitation of Agricultural Region :

(a) Agricultural Region :

(i) "Agricultural region is an uninterrupted area having some kind of homogeneity with specifically defined outer limit."

(ii) "Any segment or portion of the earth surface possessing a distinctive form of agriculture is an agricultural region."

- **Charactaristics -**
  - i) they have location.
  - ii) they have transitional boundries.
  - iii) they may be either formal or functional.
  - iv) they may be hierarchically arranged.

(b) Delimitation of Agricultural Region :

1) Empirical Technique :

- Empirical technique is largely based on the exprience of the farmers and the observed facts.
- 'Baker' - was the 1st geographer who adopted empirical technique and demarcated the agricultural belt of USA. e.g. Corn Belt, Wheat Belt, Cotton Belt etc.
- This technique gives a generalized picture of the cropping pattern and has the tendancy of overgeneralization.
- The technique has, however, been criticized as it is less objective and relatively less scientific.

2) Single Element Technique :

- This is an arbitrary technique in which the single element of agricultural landscape is taken into consideration.
- In this technique the relative position of different agricultural enterprises is taken in to considerations.

multi-element - weaver, Doi, coppock
Quantitative - Baker, whetalasy, carol
Normative - von Thunen.

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- The demarcation of rice, wheat and bajara regions of India on the basis of 1st ranking crops is an illustration of technique.
- The main weakness of this technique is that it conceals the position & importance of other crops grown in the region.
- It leads to over generalization.

3) **Multi-element or Statistical Technique:**

- This technique is improvment over the empirical and single-element technique of agricultural regionalization.
- In the statistical technique combinations of the closely associated features are taken in to consideration.
- The crop combination and livestock regions as demarcated by Weaver, Doi, and Coppock are the eg. of this methodology.
- The main advantage of multi-element technique is that it is free from biasness and significant to decision making process of the farmers.
- The non-availablity of reliable data, however is not a weakness of multi-element technique.
- This technique with the help of demarcated agricultural region in developed countries.

crop combination / livestock region demarcated

4) **Quantitative-cum-Qualitative Technique:**

- 'For the demarcation of agricultural regions, when the physical, social and economical factors are taken in to consideration, such a technique is known as quantitative-cum-qualitative technique'.
- An agricultural region; generally is an area having homogenetity of crops and livestock.
- This technique applied by Baker, Whittlesey and Carol.
- The 14 factors demarcation of Agricultural Regions:
  - i) Physical (6) - relief, climate, soil, subsoil, water and natural vegetation.
  - ii) Cultural (2) - cultural vegetation and cultural structure.
  - iii) Functional (6) - Rural popln, cultural & technological stage, farming operation, economic & cultural goods and commerce.
- Despite several limitations the qualitative-cum-quantitative

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technique geographers for delimitation of agricultural regions

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5) Normative Technique:
(आदर्श/विधी दायक दृष्टीकोण)

- It is related predicated restrictive condition some precondition in this technique.
- This technique is inherently normative & subjective, Because- baised upon 'predicided restrictive conditions'.
- Von Thunen model (1826) of agricultural location baised upon his exprience.
- A normative technique explain How landuse pattern of surface of uniform fertility? and Transport facility 'von Thunen' assuming the only on market exists.
- The normative relationship assumed in the technique is the desire to "maximum economic rent".

① Harbartson and D. marthone: - यांनीनी प्राकृतिक रचनेच्या आधारावर इंग्लंड व फ्रान्स (UK) (FR) यांचे शेती विभाग (1905) व (1924) मध्ये पाडले.

② Baker: इ.स. 1920 मध्ये अमेरिकेचे 'शेती विभाग' पाडले.

③ Olf Jonasson: युरोप खंडातील शेती-विभाग पाडताना यांनी शेतीक्रियेचे विभाजन आणि शेतकी उत्पादनाची आकारचे व यांच्या संबंधावर विशेष भर दिला.

④ Darvent Whittlesy - इ.स. 1938 मध्ये शेती-विभाग हे प्रचलित असलेल्या शेती क्रियेवर आधारित पाडले. "तेरा शेतीविभागात विभागली केली आहे."

⑤ Weaver - U.S.A mid west agricultural Region.

⑥ Coppack & Doi - आर्थिकी माहिती व पीक कालावधीच्या आधारावर.

⑦ Griffith Taylor - यांनी ऑस्ट्रेलियाचे शेती विभाग पाडले, वातावरण व शेती विभाग यांतील संबंध प्रस्थापित केला.

⑧ मेलो & लाऊडन - ऑस्ट्रेलिया सारख्या असलेल्या टास्मानिया क्षेत्राचे शेती-विभाग पाडले.

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Methodology for Agricultural Regionalization:

- The main advantages of agricultural regionalization lies in the fact that it helps of in the formulation of plans which may go a long way in reducing the regional disparities, and inequalities.
  1. Cropping Patterns
  2. Crop combination, concentration and diversification patterns.
  3. Regional pattern of agricultural productivity.
  4. Degree of commercilization.
  5. Pattern of crop rotation.

1] Cropping Patterns:

"Croppin pattern means the praportion of area under various crops at a point of time."

- It is a dynamic concept as it changes over space and time.
- The cropping patterns of a region are closely influenced by the geoclimatic, sociocultural, economic, historical and political factors.

factors

- Physical enviorment imposes limits of the growth and distribution of plants and animals.
- The role of man in the cultivation of certain crops in a region is also quiet important.

e.g. Rajsthan (Bajra), Brahmputra valley (Rice), Regur region (cotton) etc.

* The 'relative yield index' and 'the relative spread index' for the determination of suitability of crop.

(i) Relative yield Index =

$$R.Y.I. = \frac{\text{Mean yield of the crop in a compunant areal unit}}{\text{Mean yield of total area}} \times 100$$

(ii) Relative spread Index =

$$\frac{\text{Area of the crop expressed as percentage of the total cultivated area in the areal unit}}{\text{Area of the crop expressed as percentage of the}} \times 100$$

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* The area under each crop in a given region may be classified under four categories:
  (i) High yield, high spread.
  (ii) High yield, low spread.
  (iii) Low yield, low spread.
  (iv) Low yield, high spread.

* The suitability of a crop and cropping pattern may be judged on the basis of -
(i) The crop should not accentuate certain diseases as a result of fixed continious rotation.
(ii) The crop should not exhust on some specific plant nutrients from a particular depth of the soil.
(iii) The crop should be fertility building and soil improving.
(iv) The crop should return to cultivator and should provide the farmer employment.

2] Crop Concentration:

- Defn - "crop concentration means the variations in the density of any crop in an area at a given point of time".
- The concentration of a crop in an largely depends on its terrain, temprature, moisture and pedological conditions.
- It has a tendancy to have high concentration in the ideal agroclimatic conditions and the density declines as the geographical conditions become less conducive.

this comes ideal agroclimatic conditions

e.g: cotton has high concentration in black earth (regur) region.

* **Method of Determination of crop concentration:**

i] Depart-ment of Agriculture, Goverment of India:

$$\text{Croppin Intensity} = \frac{\Sigma a_{ij}}{\Sigma a_{io}} \Big/ \frac{n_i}{n_o} \times 100$$

Where,
a_{ij} - area under i^{th} crop and j^{th} year.
a_{io} - area under i^{th} crop and base year.
n_i - net area sow in i^{th} year.

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iii] Location quotient Method - 'Bhatia' (1965):-

Index for the determination of crop concentration = Area of 'x' crop in the componant areal unit / Area of all crop in the componant areal unit. : Area 'x' crop in the entire region / country. / Area of all crops in the entire region / country.

iii] Jasbir Singh method (1976):

$$Ci = \frac{Pae}{Par} \times 100$$

where, Ci = crop concentration index.

Pae = % of crop 'a' to the total harvested area in enumaration unit.

Par = % of area 'a' to total harvested area in entire region.

3] **Crop Combination:** - J.C. Weaver

- 2nd ; Nelson

Def" - "The crops are generally grown in combinations it is rarely that a particular crop occupies a position of total insolation other crops in a given areal unit at a given point of time".

- This technique firstly developed by J.C. Weaver on the basis of 'multicrop pattern'.

"Every farming system several crops are grown in combination and rarely a single crop assume complete dominance".

- for comprehensive and clear understanding of the agricultural mosaic of an agroclimatic region and for the planning and development of its agriculture a systematic study of crop combination is of great significance.

* Methods of delination of crop combination:

① i] Arbitrary choice method -

classify first crop only, first two crop only, PAGE

* first to formulate crop combination method by - 'Nelson'.
* crop combination is calculated on the basis of Ranking of crops in region.

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ii] This method based on statistical approch is more accurate, reliable and scientific as it gives better objective grouping of crops of a region.

② **Weaver methods -**

- The standerd measurment employed as follows:

① monoculture - 100% total harvested land in one crop.
② 2-crop combination - 50% in each of two crops.
③ 3- crop " - 33.33% in each of three crops.
④ 4- crop " - 25% in each of four crops
⑤ 5- crop " - 20% in each of five crops.
⑥ 10- crop " - 10% in each of Ten crops.

- Determination of standerd ~~minimum~~ deviation method:

$$SD = \sqrt{\frac{\Sigma d^2}{n}}$$

where, d = difference betn actual crop of given country.
n = no. of crop in given combination.

③ **Rafiullah Method:** (maximum positive deviation method) -
'A New Approch to the functional classification of town'.

$$d = \sqrt{\frac{\Sigma D^2 p - D^2 n}{N^2}}$$

where, d = is the deviation.
Dp = positive differences
Dn = negative differances
N = number of crops.

- काही आलेख विविध प्रकारचे पीक जास्त प्रमाणात घेतले जाते, तर काही आलेख दोन किंवा तीन पिकांचे उत्पादन जास्त प्रमाणात घेतले जाते. दोलाऱ्या आलेख दोलाऱ्या प्रकारच्या पिकांचे प्राबल्य आहे हे आपणाला पीक रचना (crop combination) पद्धतीवरून ओळखता येते.

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4] Crop Diversification:

- Def^n: "The farmers all over the world, especially in the developing countries, try to grow several crops in their holdings in an agricultural year."
- cultivation of multiple crop in an area to fulfill multiple demand of food.
- Crop diversification is opposite to crop specialization.
- The level of crop diversification depends on geoclimatic, socio-economic conditions and technological development in a region.
- Higher the level of agricultural technology, lesser the degree of diversification.
- Modern concept of Agri. Diversification is - ecological most suitable crop.

* Causes of crop Diversification:

(i) Uncertain weather - e.g. erratic rainfall, soil problem.
(ii) Subsistent farming - only family requirment., traditional grown.
(iii) Crop diversification increases the sustainability of arable land.
(iv) Generate more employment.
(v) Costly inputs - different crops different inputs.

* Measurments of crop diversification:

I] Bhatia:

$$\text{Index of crop diversification} = \frac{\text{Percent of sown area under 'x' crops}}{\text{Number of 'x' crops}}$$

II] Jasbir Singh:

$$\text{Index of C.D} = \frac{\text{\% of harvested area under 'n' crops.}}{\text{Number of 'n' crop.}}$$

III] Gibbs and Martin:

$$\text{Index of C.D.} = 1 - \frac{\Sigma x^2}{\Sigma y^2}$$

x = Area occupied by each crop to total cropped area.

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5] Agricultural Productivity :

* **Defination:**

"The measurment of production and inputs required for the production of that output is known as agricultural productivity"

- In other words, it is an input - output ratio.

* **Measurment of A.P. -**

- In traditional measurment of agricultural productivity accounts the inputs like labour and capital and production is output. Traditional method does not account of social and enviormental costs.
- At present, in the measurment of agricultural productivity the question of sustainablity of soil, health of ecosystem and social acceptiablity have important.

* **Factors affecting on A.P. -**

- Agricultural productivity of a micro or macro region depend on physical, socioeconomic, political, institutional and organizational factors.
- A.P. depends on attitudes of the farmers towords work and their aspirations for better standerd of living.

- The measurment of agricultural productivity helps in knowing the areas that are performing rather less efficiently in comparision to the neighbouring areas.

* **Methods of measurment of Agricultural Productivity :**

Ranking Coefficient method - 'Kendall's

- In this technique the component areal units are ranked according to per hectare yield of crops and the arithmetical average rank called the ranking coefficent for each unit is obtained.
- It is low ranking coefficent, indicating a high agricultural productivity and vice-versa.

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* **Patterns of Agricultural Productivity:**

- The patterns of A.P. of India have been delineated with the help of Kendall's method.

i) **Very High Agricultural Productivity -**

- It is found in upper part of gangentic plain, eastern part of India e. coast of orissa, Tamilnadu, Andhra, w. Bengal & Meghalaya etc.

ii) **High Agricultural Productivity -**

- It found part of Gujrat, satalaj plain, Yamuna - Ganga plain, Karnataka, Tamilnadu, w. Bengal, Bihar & U.P. etc.

iii) **Medium agricultural Productivity -**

- It area covers in state of U.P., Bihar, M.P., Gujrat, Orissa, Tamilnadu, w. Bengal, Karnataka. etc.

iv) **Low & very low Agricultural Productivity -**

- The greater part of central peninsular India, chota nagpur plateau, Udhampur, Himachal, maharashtra, Rajsthan, M.P., Tripura, N. Gujrat, & w. orissa etc.

INDIA: Index of Agricultural Productivity [1990-94] - Kendall's

①	Very High Productivity	- <75
②	High Productivity	- < 90
③	Medium Productivity	- < 105
④	Low Productivity	- < 125
⑤	Very low Productivity	- > 125

* **Measurment of A.P. -**

- factors influencing on Agricultural Productivity:
  Land, Labour, capital, Enterprenership.

1) **Land Productivity -**

$$\text{Land productivity} = \frac{\text{Total agri. product of year}}{\text{Net. sown area of that year.}}$$

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2) **Labour Productivity -**

Labour Productivity = $\frac{\text{Total agri. product of year}}{\text{Total labour force of year.}}$

3) **Capital Productivity -**

capital productivity average = $\frac{\text{Total agri. product of year}}{\text{Total gross cropped fixed capital in dorage in that year}}$

- But, above mention '3' does not have equal weight in finding out the productivity

land-0.50
labour-0.26
capital-0.24

Generally Land, Labour and capital are given 0.50, 0.26 and 0.24 weighted index value.

Agricultural Productivity =	Total Production of year / Total of weight input indices the productivities of the year.

6] **Agricultural Efficiency : 'कृषीक्षमता'**

(1) "Agricultural efficiency is an ratio, betn achivment in terms of production and actual potential of land."

(11) "It means obtaining maximum returns from land under prevailing physical and cultural enviorment with the application of human efforts at the present level of development." "कोणत्याही भागातील भौतिक सांस्कृतिक वातावरण मानवी श्रम व तंत्रज्ञान यांचा वापर करून जमिनीच्या वास्तविक उत्पादनाच्या क्षमतेचा जो परिणाम मिळतो त्याला कृषीक्षमता असे म्हणतात."

* Agricultural efficency depends upon the combined effect of the total factors:

1. **Physical factor -**
soil, topography, terrain and climatic condition.

11. **Socio-economic factor -**
- size of the land holdings, land owenership, type of farming and market condition.

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iii. Techno-organisational factor-

- cropping pattern, irrigation, use of fertilizers & pesticides, and the level of mechanisation.

* Methods of measurment of crop efficiency:

1] Find out efficiency of each crop-

(i) Efficency of Rice = $R_E = \frac{y_r}{Y_r}$

(ii) efficency of wheat = $W_E = \frac{y_w}{Y_w}$

where,
y_r = Yield of distrct.
Y_r = Yield of state.

2] Then Agricultural efficency would be=

$$A_E = \frac{(R_E \times R_c) + (W_E \times W_c) + \cdots + (N_E \times N_c)}{R_c + w_c + \cdots + N_c}$$

where, R_c = Avarage in Rice
R_E = Avarage in wheat

3] Incase of monocultur - (one crop) :

$$A_E = \frac{R_E \times R_c}{R_c}$$

$$I_{ae} = \frac{C_{pe}}{C_{pr}} \times 100$$

where,
I_{ae} = Index value of efficency
C_{pe} = Carrying capacity of popln in unit
C_{pr} = Avarage carrying capacity of entire region.

Agricultural efficiency	Agricultural Productivity
(i) It is defined as interms of surplus value	(ii) Agri. productivity is simple output per unit land area.
(iii) Higher agricultural efficency entails higher productivity.	(iv) Higher productivity may be necessary entails higher efficiency.
(v) efficiency depend on physical, socio-economic, techno-organization factor.	(vi) Productivity depends on land (50%), labour (26%), and capital (24%).
(vii) It conceptional term.	(viii) It is empirical term.

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VON THUNEN'S MODEL:

J.H. Von Thunen (1826).

- Von Thunen's theory was partly based on his studies of the work of economists such as 'Adam smith' and 'Albert Thaer' and partily his on exprience.
- In constructing his model, he used mecklenburg, near Rostock in Germany.

* Aim of the Theory:

- Von Thunen's analysis was to show how and why? agricultural landuse varies with distance from the market.

* He had two basic models-

① **Model I**: The intensity of production of a particular crop decline with distance from the market.

② **Model II**: The type of landuse varies with distance from the market.

* Assumptions:

① At the centre of the agricultural region is a single isolated market town.

② The surface was perfectly flat and featurless with no barrier to movment.

③ Physical resources evenly distributed i.e. fertility of soils, labour.

④ The cost of transportation is directly proportional to the distance. Transport costs were the same everywhere & in every direction.

⑤ There was only one form of transportation, namely horse & cart.

⑥ A single large city served as the sole central urban market.

⑦ All farmers act as aim to maximise their profits & have full knowldge of the needs of the market.

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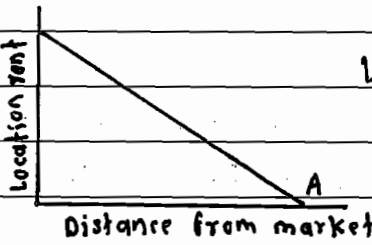
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⑧ An even spatial distribution of population and settlments.

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* Principles :

- The basic principle underlying Von Thunen theory is: Economic rent ; which have worked later called 'Locational rent'.
- where by differents types of landuse produce different net returns per unit area.
- The two other relationship were distance of farms from the market, and the prices recived by the farmers.



$$LR = Y(m-c) - Yfd$$

fig: Location rent & distance from market one crop.

- The price a farmer obtains for any unit of his product is equal to its price at the market minus the cost of transporting it to the market.
- Economic rent: "is defined as the measure of the level of return, that the market at large would expect, a particular piece of land to produce."

② Model I: Intensity Theory -

- The intensity of cultivation decreases away from the city. For the same crop having a similar market price.
- Location rent higher in the near the city than the crops on the farm away.
- The cost of transportation will be less for produce of the farm near the city & hence, a higher locational rent.

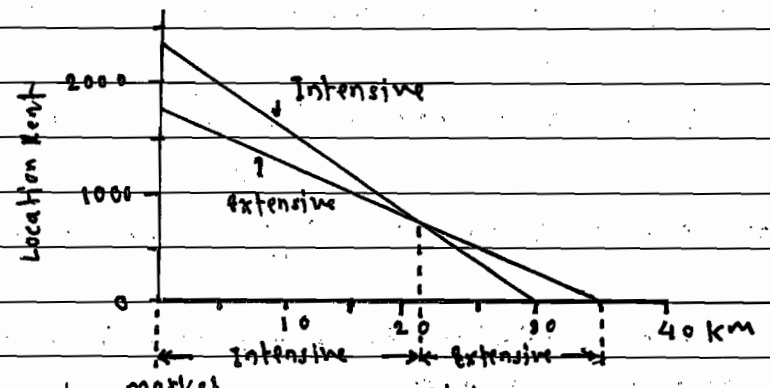


fig: Locational rent varying with distance from the market

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⑥ Model II Crop Theory : Landuse varies with Distance -

- Von Thunen's second model examines the location of several crops in relation to the market.
- The location is determined by :
  i) Its specific market price, depending on the supply and demand relationship for that good.
  ii) its specific transportation rate, which will vary according to the nature of the product - its bulkiness, perishability and general transportability.
  iii) its basic cost of production which is assumed to be constant in space for any one good,
  iv) Its specific yield per unit of land.

- Thus, every product will have a different location rent curve each having a different height and different slope.
- There can be two cases -

1) Case A :

- Two crops, A and B, may have the same production costs and yields but different transport costs per unit & market prices.
- If, A is more costly to transport and it has higher market prices,
  'A' will be grown closer to the market than 'B.'

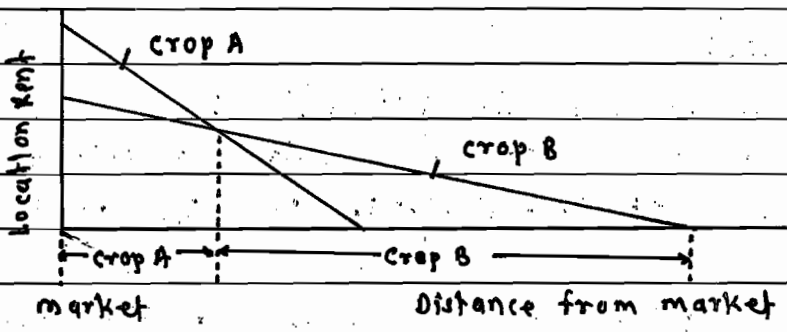


fig : Two crops types, locational rent and distance from market.

- The locational rent for 'A' decreases more rapidly than that of B, because A's higher transport costs.

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2) Case B:

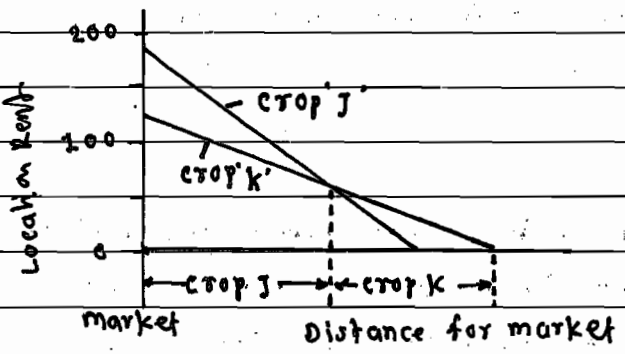
- Two crops 'J' and 'K' may have the same production and transport cost per tonne/km but different market prices and yield per unit of land.

If,

'J' has a higher yield and lower market price than 'K', it will be grown closer to the market than K.

- The location rent of 'J' decreases more rapidly than of 'K' because the higher yield means higher total transport costs.

- The higher yield of 'J' offsets its lower market price so that the revenue recived at the market for 'J' is greater than K.
- Since, production costs are the same, a higher revenue for 'J' means that it has a higher locational rent at the market.



Von Thunen's suggest Agricultural zones:

a) Isolated state:

I. Market Gardening and milk production:

- Fresh milk and vegetables are required constantly in the city. Given their perishibility they had produced close to the market.
- Therefore, the prices had to be higher so that they are profitable for farmers close to the market.

II. Fire wood and lumber production:

- The production of wood, a bulky product in great demand in the city as a fuel.

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- In Thunen's time firewood was needed constantly for fuel, building and other purpose.
- Forestry yielded a higher locational rent since its bulkiness meant relatively larger transport cost.

III. Crop farming without fallow and pasture land :

- The food grain also grown in this third ring intensity of land is more than 4th ring input are more available.
- In this ring the 3rd ring is near to the market and intensity cultivation profit more than 4th & 5th ring.
- The transportation cost lower than outerring.
- six year cropping pattern developed :
  1st & 2nd - Rye, 3rd - Potato, 4th - Barely, 5th - clover (RPB cv), 6th - Vetch.

IV. Crop farming with fallow and pasture land -

- This zone occupied by intensive farming farmers used '9' year crop rotation.
- Crop intensity decreses with increased distance, profit lower than 3rd ring due to transportation cost high.
- 7 year rotation : pasture - pasture - pasture - rye - barely - oats - fallow.

V. Three field system :

- In the most distant of the zones supplying rye to the city.
- Three field system : 1/3rd area - field crops, another 1/3 - for pastures, and the rest left fallow.
- Field crops are grown by rye, barley and fodder crops.

VI. Livestock farming :

- The farthest zone belonged to livestock farming.
- Here the distance was so great that even the most extensive.
- Instead, it was produced on the farm to feed livestock and the animal products were marketed.

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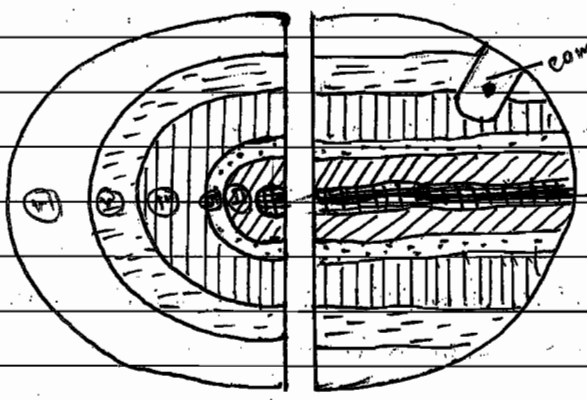


fig: The concentric zones around an isolated state.

b] **Modified conditions:**

-Von Thunen incarporated two examples of modifying factors

① **Nevigable river**: where transport was more speedy and the cost was $\frac{1}{10}^{th}$ as much as on land.

② **smaller city** - acting as a competing market centre.

-The inclusion of two modification produced much more complex landuse pattern.

* **Criticism:**

① This model does not exist in reality.

② many assumption of these theory not found.

③ Praportionaly transpost cost does not increas with increse distance.

④ Today several market are developed.

⑤ Transportation & refrigration facilities are available.

⑥ New technology development today.

⑦ He didn't consider human behaviour.

* **Application of Von Thunen Model:**

1] **changing technology and von Thunen Theory -**

- Significant changes in technology which have mode this theory unworkable in present.

① Timber as little used as fuel and not command the classmate proximity to the market.

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(ii) It possible to move perishable products to long distances, due to bottling, canning & refrigeration.

2) Changing role of transportation costs -

(i) The transport of must farm produce is still cheaper by water than over land.

(ii) The reduction of freight rates has not removed the differences in the value per unit weight of agricultural products.

3) The role of human behaviour -

- Farmers do not behave as economic men as Thunen postulated. They are often not independent one another.
- Cooperative production has developed since Thunen day.

* Von Thunen model and Reality:

- The intensity of agricultural landuse & the price of land increase towards the market as Thunen suggest.
- He examining agricultural locations at local, national and international scales.

- It is useful in present date also, in two main ways:
  (i) focuses attention on economic factors, particularly transport costs and distance to market.
  (ii) introduces the concept of locational rent into geography.
- Both these concepts are usefull in styding urban and rural landuse.
- It provides a useful framework for organising village and farm studies.

- In von Thunen's model of agricultural zones around a city, each zone specilises in the production of those agricultural products to which it is best suited.
- Von-Thunen did not conceive the advantages of combined operation of specilized agricultural enterprises & the livestock.

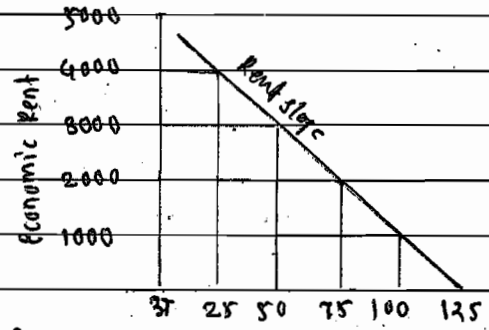
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आर्थिक खंड (Economic Rent) - - D. Ricardo (1817)

'कृषीमध्ये वेगवेगळ्या सुपीकतेपासून मिळणारा मोबदला म्हणजे आर्थिक खंड होय'

① Transport cost - बाजारपेठेजवळ असणाऱ्या एक हेक्टर क्षेत्रापासून पैशाच्या स्वरूपात मिळणारे उत्पन्न हे बाजारपेठेपासून दूर असणाऱ्या एक हेक्टर क्षेत्रापासून मिळणाऱ्या उत्पन्नापेक्षा जास्त आहे.

- हा आर्थिक खंड प्रामुख्याने वाहतूक खर्चावर अवलंबून असतो.



② पदार्थांचा नाशवंतपणा - दूध, भाजीपाला, फुले, यांसारख्या नाशवंत पदार्थांचे उत्पादन बाजारपेठेच्या शक्यतेत घेणे किफायतशीर ठरते.

- बाजारपेठेपासून जसे दूर जावे तसे मिळणारा मोबदला कमी होत जातो.

सूत्र :

$$P = V - (E + T)$$

∴ P - आर्थिक खंड, नफा, मोबदला.

V - कृषी मालाची बाजारपेठेतील विक्रीचे किंमत

E - उत्पादन खर्च

T - वाहतूक खर्च

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AGRICULTURAL SYSTEMS

- The most important classification was that of 'Derwent whittlesay' in 1936.
- whittlesay acknowledged the major contribution of 'D. Jones' Wellington, inthe prilimiary draft and map concering.

* whittlesay's classification :

- The classification of geographical charactaristics of agriculture must take into account two combinations.

① Physical -

The combination of natural environmental conditions, i.e. important element is terraine, climate, soil & water.

② Non-Physical -

The combination of human circumstances are those elements institutional, biochemical, techno-organisational, demographic, cultural and infrastructural.

* Whittlesay's five fold criteria :

1) The crop & live-stock combination
2) The methods & techniques used to grow crops.
3) Inputs i.e. labour, capital & organization.
4) The disposal of agricultural produce.
5) farm building & farm operations.

* Fundamental cleavage betn '3' types of Agriculture :

I. The occidental world - which use machinary. e.g. USA, Russia etc.
II. The oriental world - which uses much hand labour and obtains high outruns. e.g - India, China etc.
III. Backward Regions - where hand tools, often crude produce small returns in Asia and Africa.

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* Classification of world Agriculture :

- The framework of the agricultural system of the world, except collective farming as outlined by whittlesay :

A] Ecological or Near Ecological Systems -

1. Nomadic Harding.
2. Shifting Cultivation.

B] Subsistance Systems -

3. Rudimentry sedentary Tillage
4. Intensive subsistance Tillage (with paddy dominance)
5. Intensive subsistance Tillage (without paddy dominance).
6. Subsistance Crop and Livestock farming.
7. Mediterranean Agriculture. (occidental world).

C] Collective systems -

8. Collective farming (crop & livestock).

D] Commercial Systems -

9. Medeterranean Agriculture (new world)
10. Livestock Ranching.
11. Commercial Grain farming.
12. Commercial livestock and Crop farming.
13. Commercial Dairy farming.
14. Specilized Horticulture (fruit) & Olericulture (vegetables)
15. Industrial crops.

E] Cash - cropping system -

16. Commercial Plantation Tillage.

a] Nomadic Herding : घुमन्तु

- Nomadic herding involving the grazing of domesticated animals on natural pasturage.
- There is constant or seasonal migration of the nomads, and their folcks.

Distribution:

- In large belt of arid & semi-arid land includes North Africa, middle east and parts of central Asia.

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- In Africa, Fulani - W. savannas, Masai - E. Africa, Nuba - in Ethopia & sudan, Bantu & Hottentots - S. Africa in Botswana, Tuareg - Sahara and Bedouins - Saudi Arabia.
- Kirghiz, Kazakhs and Kalmuks the main nomadic herders.

* **Charactaristics :**

1) Nomadic Herding an aboriginal form of livestock raising.
2) It is simplest form of pastoralism in which herds and flocks.
3) Nomads depends primiarily on animals rather than crops for their survival.
4) Nomads select the type and no. of animals for the herd according to local, cultural & physical charactaristics.
   e.g. Camel (Africa & middle East), Cattle (Tropical Africa), Horses (central Asia), Llamas (S. America) etc.
5) The minimum no. of animals necessary to support each family.
6) Conditions of extrme drought and severe cold sometimes causes a heavy loss of herds.
7) Nomadic herders are constantly or intermittently on the move.
8) Nomadic herders life depends upon their animals, which provide food, clothing, transport & material from houses.

b] **Shifting Cultivation :** ~~मदी शेती~~

- 'shifting cultivation better known as simple subsistance farming'.
  "shifting agri. refers to the traditional method of agriculture in which a piece of land cultivated for a few year, then it is allowed remain fallow due to decline fertility of soil".
- In these agriculture known as primitive, migratory, cut-and-burn, slash-and-burn, and bush fallow agriculture.

* **Distribution -**

- areas of central Africa, Central America and SE Asia.
- Different part of world shifting agri. different names :
  ① Mexico → Berbecho, Coamile.
  ② Brazil → Quemadas, Roca, Derubadas.
  ③ Central America → milpa.
  ④ Central Africa → chitemene & masole.

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(v) Malaysia → Ladang
(vi) Malagasy → Tavy
(vii) Kaingin → Phillipines.
(ix) Chena → Srilanka
(x) Humah → Java
(viii) Tamrai → Thailand.
(xi) Ray → Laos
(xii) Paungye → Burma
(xiii) Diuma → Sumatra

* **Characteristics:**

(i) Shifting cultivation generally live in small villages.
(ii) Most of the sites are in the remote interiors away from the main popln centre.
(iii) The trees at the selected site are cut down and those are economically usefull.
(iv) The cultivated patches are usually very small about 0.5-1 hectare.
(v) The crops grows is land used in for only a short time, usually three years or less.
(vi) Inferior tillage implements, poor seeds, constant ravages by insects, birds and animals.

* **Demerits -**

+ It distroys natural resources & genetic wealth. eg- soil erosion.

* **Shifting cultivation in INDIA:**

(i) Aassam → Jhum
(ii) Ponam → Kerala
(iii) A.P Podisa → Podu
(iv) M.P → Beewar, Mashan, Pend, & Beera.

C) **Subsistance Agriculture:**

* The subsistance farming is the cultivation of crop & rising of animals to feed the farmers & his family members, this is called subsistance agriculture.

- 'The application of more labour & capital to relatively small unit of land in order to obtain yields & produce several crops from the same field in year is called intensive cultivation'.

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* Distribution:

- It is carried on mainly in china, Japan, India, Bangladesh, Myanmar, Thiland, srilanka, malaysia, philipines, Indonesia, Laos, kampuchea, and island of pacific orean.

* There are two types of Intensive subsistence Pillage:

① Dominated by wet paddy.
② Dominated by crops other than paddy.

* Characteristics:

① The size of farms very small.
② Traditional method of agriculture and dominant role of hand labour.
③ It is a multi-crop system, rice is dominated other than crops are jawar, cottan, wheat, bajra etc.
④ Little importance to animal farming.
⑤ Use of plant and animal manures.
⑥ farming is very intensive.

d) Commercial Grain farming:

"In commercial grain farming product are sale in national and international market and mainly gained benefit, so this type of agriculture known as commercial grain farming".

* Distribution:

- The United states, Canada, the CIS, Argentina and Australia. Eurasian - steppies, American - Prairies, Pampas - Argentina, Veldt - S. Africa, Downs - Australia, and Canteburry - Newzeland.

* Characteristics:

1) farms are very large from 240 to 16000 hectares.
2) Monoculture of wheat.
3) cultivation is highly mechanized - threshing, reaping, & cleaning.
4) Extensive nature of cultivation - employing little labour and a greater use of farm machinary.

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5) Complexes of farm buildings are located on farms - large machinary shade & storage facilities for grain.

6) Extensive commercilized grain farming is subject to climatic vagaries like drought, hail & frost, plant diseases.

7) Economically commercial grain farmer are very rich than other farmer.

e] Mixed farming :

(Commercial Livestock and Crop farming)

"The most common form of commercial agriculture is mixed crop and livestock, which can also be called as mixed farming".

* Distribution :

- Europe : west & eastern - France, Spain, Denmark, Netherland, Germany.
- N. America - Indiana, Ohio, middle mexico etc.
- South Africa, NE Argentina, SE Australia, & Newzeland.

* characteristics :

1. The avarage size of the holdings varies from 10-15 hectares.
2. mixed farming is the integration of crops and livestock.
3. High expenditure, on machinery & farm buildings, extensive use of manures and fertilizers.
4. A variety of crops are grown in the mixed farming region.
5. In mixed crops & livestock farming, the farmer's workload is distributed throughout the year.
6. The livestock farmer maintains soil fertility by using a system of crop rotation.
7. The return of commercial mixed farming is relatively high, because cattle herds for milk, meat, hides & skins.
8. mixed farming required various types of farm buildings, sheds, houses for livestock, stoar house etc.

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f) **Dairy farming :**

"The rearing of the cattle for milk products like butter, cheese, condensed and dried milk etc is known as dairy farming."

* **Distribution :**

- NW Europe (50° to 60°N) - Denmark, Finland, Belgium.
- NE United state (40°-50°N) Canada.
- SE Australia, N. Newzeland (30°-40°S),
- W. USA, East Argentina, middle chile, south Africa, eastern Japan and western Russia.

* **Charactaristics :**

① Dairy farming is capital intensive farming.
② The buisness is required more labour and offers great scope for employment.
③ The productivity is very high in dairy farming.
④ A scientifically dairy farm yields fairly high returns.
⑤ Dairy farms produce milk and milk related products.
⑥ Dairy farms usually do not sell their products directly to consumers.
⑦ The production of dairy products varies from region to region.

g) **Plantation Agriculture :**

"It refers to large scale, capitalised and often highly centralised cultivation in the plantation of cash crops for export. is called plantation agriculture."

* **Distribution :**

- These commercial agriculture found in the tropics and subtropics of Latin America, Africa and Asia.
- Asia : India, Malaya, Indonesia, srilanka, Phillippines, Thailand, Myanmar etc.
- S. America : Brazil, Argentina, Venezuela, West Indies, Cuba etc.
- Africa ; western, eastern & middle part of Africa.
- Australia, Ocean Island & Madagascar, Honolulu). PAGE
- Tea plantation developed in the equatorial regions & highest importer is USA.

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* **Charactaristics:**

i. Plantation crops are raised on large estates of more than 40. hectares.

ii. Most estates have foreign ownership but labour employed is local - skilled & unskilled labour require.

iii. Farming in estates is scientifically managed.

iv. Plantation farming is capital intensive.

v. In the plantation agriculture product are depend upon international market demand.

vi. It is crop specilization crops are rubber, tea, coffee, sugarcane, oil, palm, cotton and fruits e.g. Banana, pinepple etc

- Latin America: Coffe, Sugarcane and bananas. (W. Indies)
- Asia: Rubber and palm oil. India (Tea), Malaysia (Rubber) Indonesia 'Java' (Sugarcane) Cocoa (Ghana).
- Africa: cocas and coffe.

* **Advantages:**

(i) Higher standerd of living local workforce.

(ii) Use of fertilizer and pesticides improved outputs.

(iii) Icreases local employment.

(iv) Housing, school, Health, transport, electricity and water supply facility provided.

* **Disadvantages:**

(1) Exploitation of local labour.

(2) Overuse of land has led soil erosion.

(3) Insects & diseases distroy crops.

(4) owner and Labour conflicts.

(5) Fluctuation in price of national level.

(6) Cash crops impact on foodstuff.

(7) National economic policy.

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Mediterranean Agriculture	Monsoon Agriculture
(i) Mediterranean with lower rainfall, in winter season	(i) It is associated with higher rainfall, in summer season.
(ii) The largely concerned with Horticulture & olericulture.	(ii) It is largely concerned with grain farming. e.g. rice.
(iii) It is confined to small valleys, narrows floodplains & deltas.	(iii) This region on alluvial plains, delta, loess covering large areas.

Livestock Ranching	Nomadic Herding
(i) It's distribution in grassland e.g. steepe, veld, down etc.	(i) The vast expanse of old world.
(ii) Livestock ranching by fixed and permanant houses	(ii) Nomads freely move & migrate from one region to another region.
(iii) The emphasis is on one single type of animals.	(iii) different kinds of animals are raised.
(iv) The economy purely commercial.	(iv) The economy subsistence.

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Transhumance : / अदले पशुपालक.

'Transhumance refers to the seasonal movment of people and their herds from valley to mountain during summer and from mountains back to valley during winters'.

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Rice:

- The earliest producer China (7000 B.C.) - Chang-Jiang Delta.
- 'Miracle Rice' is developed in Philipines; at the R.R.I of Manila.
- Diseases as stomatitis, Glossitis & chelosis ; Beri-Beri.

Rice producers	million metric tono	Areawise	Rice Yield
1. China	134.33	India	Egypt
2. India	99.18	China	USA
3. Indonesia	38.30	Indonesia	Peru
4. Bangladesh	31.00	Bangladesh	S. Korea
5. Vietnam	34.29	Thailand	Japan.

Wheat:

-International Research Institute 'Damascus' (mexico).

	Wheat Producers(mt)	Areawise-Countries (mh)	Wheat Yield (Mt/hq)
1.	EU-27	India	Netherland
2.	China	EU-27	Denmark
3.	India	Russia	UK
4.	U.S.A.	China	Germany
5.	Russia	U.S.A.	France.

Maize:

- makka (India), corn (USA), Indian corn (Europe).

	Producers	Areawise	Yield
1.	USA	USA	Italy
2.	China	China	USA
3.	EU-27	Brazil	France
4.	Brazil	EU-27	Canada
5.	mexico	India.	Egypt

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Tea:

- The tea cultivation originated chang Jiang valley (china).
- major varities.:
  china - Green tea ; small leved
  India - Black tea ; large leaved
  Taiwan - Oolong tea.
- 'keneya' is larger exporter again srilanka & china.

* Tea Producers:
  1. china 4. sri Lanka
  2. India 5. Turkey.
  3. keneya

Coffe:

- Leading Producer Latin American and Carribean countries.
- Types : coffee Robusta, coffee - Arabica, coffee Liberica.
- Large cotfee plantation in Brazil known as 'FAZENDA'.

*Producer's:
① Brazil, ② Vietnam, ③ Colombia ④ Indonesia, ⑤ Peru ⑥ India

Cotton:

	Production	Area wise	Yield
1.	china	India	Australia
2.	India	china	Brazil
3.	USA	USA	Syria
4.	Pakistan	Pakistan	ehina
5.	Brazil	Uzbekistan	Turkey.

	Sugar Cane	Sugar Beet
1.	Brazil	1. france
2.	India	2. Russia
3.	ehina	3. USA
4.	Phailand	4. germany
5.	Pakistan	5. Turkey

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	Rubber	Jute
1.	Thailand	India
2.	Indonesia	Bangladesh
3.	malaysia	china
4.	India	Myanmar
5.	Vietnam	Uzbekistan

	Tobacco	fruits & vegetables
1.	China	India
2.	Brazil	Vietnam
3.	India	China
4.	USA	Iran
5.	Argentina	Indonesia.

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Concepts:

- ~~Wes~~Losch - Market Area location Theory.
- ~~Fes~~Weber - Least cost Theory.
- Reily - ~~Agglomeration~~ Theory of Gravitation
- Thombson - Agglomeration Theory

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* Soil formation and composition :

- मृदेमध्ये आढळणारे विविध घटक - पाणी व हवा (25%), खनिज द्रव्ये (45%) & सेंद्रिय द्रव्ये - (5%)

- Chernozom soil - low quantity of minerals & Regur soil : High quantity of minrals.

- Def^n : "Soil may be defined as the thin surface layer of earth formed by the break layer of the earth formed by the breaking down of the rocks in various ways & by various purpose".

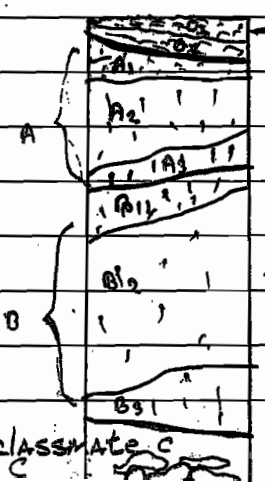
* Functions of the soil -

① वनस्पती बीज उगवण्यासाठी व वाढवण्यासाठी साधन मृदा.
② वाढत्या वनस्पतीस मृदा पोषणास आधार देते.
③ वनस्पतीच्या मुळांना पाणी पुरविणे.
④ N₂, Fe, Iorn असलेल्या खनिजद्रव्ये मृदा पुरविते.
⑤ असंख्य जिवांचा मृदा ही आवास (Habitat) आहे.

* factors of soil formation -

① Relief
② Climate
③ Parent Rock
④ Time
⑤ Biotic factors.

* Verticle Soil Profile :



- organic minerals
- Podolized horizon.

* Soil type ascending order of thickness A horizon :
① Chernozem soil
② Chestnut soil
③ Alluvial soil
④ Laterite soil.

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* Soil classification :

અ) પ્રાકૃતિક ગુણધર્મોનુસાર :
1) રંગ - કાળી, તાંબડી, રાખોડી, તપકિરી, પિવળી.
2) પોત - (i) વાલુકા (Sand) - 2 - 0.05 mm.
(ii) Silt : 0.05 - 0.002 mm.
(iii) clay : < 0.002 mm.

બ) રાસાયણિક ગુણધર્મોનુસાર
અ) (i) અમ્લધર્મી
(ii) આમ્લધર્મી
(iii) ક્ષારિય
(iv) અક્ષારિય
2) (i) પેડાલ્ફર - ઍલ્યુમીનો, ફેરસ. Aluminium & iorn oxide
(ii) પેડોકલ્સ - ચેરસ્નટ, ચેનોઝમ - carbonate.

ક) ઉત્પત્તિ પ્રદેશાનુસાર -
1) ક્ષરિત કટિબંધીય : (i) ટુંડ્રા (ii) લેટરાઈટ.
2) સમશીતોષ્ણ : (i) ચેનોઝમ (ii) ચેસ્ટનટ (iii) પ્રેઅરી
3) ગુણાકૃતિબંધીય : (i) લૅટેરાઇટ (ii) લાલ.
4) ઠંડા : (i) પર્વતીય (ii) ટિકાગ્રી (iii) calcareous.

ડ) નિર્મિતિનુસાર (સ્થાન) :
1) સ્થાનિક મૃદા
2) આંતર વિભાગીય મૃદા
3) અવિભાગીય મૃદા.

ઈ) નિર્મિતી કાલાનુસાર :
1) નવમૃદા (અવિકસીત)
2) પુનિમૃદા (વિકસીત)

• **Polypedon** –
'A soil column extending down from the surface to reach a lower limit in regolith or bedrock is known as polypedon'

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Clay < colloids < silt < sand.

Core and peripheri model – Theodore Shultz.

	Types of soil	pH values
i)	Agricultural soils	pH 8 – 8.5
ii)	Extremely Acidic soils	pH 5 – 8
iii)	Neutral Soils	pH 7
iv)	Extremely Alkaline soils	pH 4 – 4.5

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World soil classification:

a] Group 1 :

- Soils with well developed horizons or with fully weathered minerals.
- Resulting from long-continued adjustment to prevailing soil temprature & soil water conditions.

1) Oxisols -

- Very old highly weathered soils of low lattitude.
- subsurface horizone of accumulation of mineral oxides & very low base status.

2) Ultisols -

- Soils of equatorial, tropical & subtropical latitude zones.
- with a subsurface horizon of clay accumulation and low base status.

3) Vertisols -

- Soils of subtropical & tropical zones with high clay content & high base status.
- Vertisols develop deep, wide cracks when dry, & the soil blocks formed by cracking move with respect to each other.

4) Alfisols -

- soils of humid & subhumid climates with a subsurface horizon of clay accumulatn & high base status.
- Alfisols range from equatorial to subarctic latitude zones.

5) Spodosols -

- Soils of cold, moist climates, with a well developed B horizon of illuviatn & low base status.

6) Mollisols -

- Soils of semiarid & subhumid midlatitude grassland.
- with a dark, humus-rich epipedon & very high base status.

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7) Aridisols -
- soils of dry climates, low in organic matter.
- often having subsurface horizons of accumulation of carbonate minerals & soluble salts.

b] Group II:
'soils of a large proportion of organic matter'.
Histosols - soils with thick upper layer very rich in organic matter.

c] Group III:
soils with poorly developed horizons or no horizons, and capable of further mineral alteration.

⑨ Entisols -
soils lacking horizons usually because their parent material has accumulated only recently.

⑩ Inceptisols:
soils with weakly developed horizons, having minerals capable of further alteration by weathering process.

⑪ Andisols -
soils with weakly developed horizons, having a high proportion of glassy volcanic parent material produced by erupting volcanoes.

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- General character of Geographic knowledge during the ancient and medivial Period.
- Foundation of Modern Geography: Contribution of German, French, British and American school.
- Conceptual and methodological developments during the 20th century.
- Changing Paradigms.
- Man and Enviorment, Determinism and Possibilism, Areal Differenciation and Spatial organisation.
- Quantitative Revolution.
- Impact of Positivism, Humanism, Radicalism and Behaviouraljsm in Geography.

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- Ibn-i-batuta - Kitab ur Rehle

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I. GENERAL CHARACTER OF GEOGRAPHIC KNOWLEDGE DURING THE ANCIENT AND MEDIEVAL PERIOD

A] Greeks: The Pioneers of Prehistorical Ideas -

Geography has a long genealogy than any other science. In the ancient period, geography as a explorations, mapping of the areas & the collected material. The Geographical knowledge had been a concomitant of different civilization;

① Astronomy - flourished in chaldaea, Assyria & Babylonia, where skies were mostly clear.

② Geometry - developed in the fertile, arable lands of nile valley.

③ Physical Geography - in Greece, characterized by diverse relief features indented coastline.

④ mathematics - developed in made possible the building of Gizeh pyramid.

- Hellenic Culture:

Geography was regarded as the knowledge of topographical features, mountains, rivers and places.
'The old Testament' - the religious book of the Jews, contain geographical knowledge of Palestine and neighbouring districts.

- Phoenicians Culture:

Phoenicians were the first repositories of geographical knowledge, but their narrow, selfish and secretive policies - Phoenicians occupied Asia minor, Tyre, Sidon were their major ports and towns.
- Gadeira (1100 B.C), Carthage & Utica (813 B.C) along the northern coast of Libiya (Africa).

* Jue (ચૂ) obj - old Testament માંથી ઘણી માહિતી.

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GREEKS :

The Greeks were pioneers in geographical knowledge. Their period is known as the 'Golden Age of Greece'.

- Greeks borrowed many concept of astronomy, geometry and mathematics from the Egyptians, Chaldeans and Assyrians.

However Geographical knowledge limited to Greece -

(i) Greece situated both the sides of the 'Aegean sea'.
(ii) The great diversity in its topography & physical features.
(iii) The land making the coastline highly indented, coastline helps development of inspiring traders to the neighbour.
(iv) Greeks physical setting, able to advancement in Geomorphology, climatology and oceanography.
(v) Greece lies weak zone of the earth, records tremors and earthquake.
(vi) There numerous hot spring & volcanoes.

a) Homer - (13th B.C.)

He was probably the greatest 'Greek poet'.

- His work published 'Iliad and Odyssey' (description Trojan war 1280 B.C to 1180 B.C.)

Earth
Sky
Sun & planet
Wind

- He believed earth as circular form, surrounded all sides by ocean river.
- The earth resting on tall pillers.
- The sun rose out of the ocean stream and again sank same.
- The stars also bathing everyday in the ocean water.
- Winds : (i) north wind 'Bores' - strong & cool (ii) 'eurus' east wind - warm & gentle (iii) South 'notus' - storm, wet & violent. (iv) Zepyrus - west wind ; dreaded, balmy with gale force.

BORES
NOTUS ← → EURUS
ZEPYRUS

b) Thales of Miletus - (7th B.C.)

Thales was the first Greek thinker, philosopher and traveller, several basic therom of geometry.

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- He was the also first person about measurment and locations of things on, the face of the earth.
- Thalse was a practicle buisnesman; 'father of philosophy'.
- Thalse was inspired by Egyptians and solved many problems of Geometry and Trignometry.
- He visulized the earth as a disc floating in water.
- contributions: sun & stars were ball of fire, diameter of solar disc was 1/720 of zodiac, calculation of solar eclipse as may 5858.

c) Anaximander - (6th B.C.)

He was a disciple of Thales in Miletus.

- He introduced a Babylonian instrument 'gnomon'.
- Gnomon just like sun dial, sun could be measured by the length and direction.
- He prepaired a world map to scale; In this map Greece has been centre of world. The map was circular and was bounded on all sides of ocean river. (1st map of world).

d) Hecataeus:

Hecateaus known as 'father of Geography'.

- Hecataeus collected and classified information of the known Greek world.
- His main book 'Ges-periodos' - description of earth (6th B.C.)
- It give detailed account of mediterranean sea, islands, straits and describe general outline of all countries.
- Hecataeus travelled the then known world extensively.
- Books: ① 'Geographical information of europe' - Greece & European coast.
② Libiya (Africa plus Asia).
- Hecateaus maintained is a circular plane and Greece is the centre of world.

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e) Herodotus (485-425 B.C.) - 'Nile is the gift of Egypt'.

He was the first and foremost historian, and is regarded as the 'father of History'.

- His idea: 'all history must be treated geographically and all geography must be treated historically'.
- He accepted Homeric view - earth as a flat disc over which the sun travelled east to west.
- His nine book entitled - Clio, Euterpe, Thalia, Melpomene, Terspichore, Erato, Polymia, Urania, Collipe.
- He considered the Caspian as an inland sea.
- A vivid description was put forth about the existing tribes and their way of life.
- Herodotus divided world in to three continent of Europa, Libiya (Africa) and Asia.
- He was first to draw meridian on world map.

f) Alexander the Great:

He taught his pupils 'Aristotle' to 'go and see' for themselve weather a perticular theory accepted.

- Alexander who marched towards east with a well-trained and disciplined army.
- His main objective was to established Greek rule all over world & determine outer limit of the world.
- Alexander contributed records & itineraris in the field of historical and Regional geography.

g) Eratothenes (276-194 B.C) -

The first scientific geographer ascertained the length of equator with remarcable precision.

- He measure the angle bet^n vertical obelisk & sun rays.
- He attempted distance bet^n sun & moon from the earth. as moon 78,000 miles/stadia, 00,000 miles/stadia.
- The first treaties on cartogra... written by Eratothenes.
- Eratothenes used the meridian of Alexandria, Seyen (Aswan).

Mathamatical Tradition → Phonician
Exploration → Thales
Inductive method → Homer
Literary Tradition → Aristotle.

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- He was founder of 'Geodesy'
- He accepted 5 climatic zone: a torrid, two temprate & 2 frigid.
- Eratothenes prepared world map with the help of longitude & latitude.

Eratothenes first coined the word 'Geography' and is rightly known as 'the father of Geography'.

- The first to divide the world landmass into 3 conti - Europe, Asia & Libiya.

i) **Hipparchus:**

Hipparchus was a Greek astronomer & mathmatician.

- He invented an instrument 'astrolabe', which measurment of latitudes at sea by observing the angle of the pole star.
- He introduced the concept of stereographic & orthographic projections on a map.
- He listed about 850 stars, the apparent brightness.
- Earth turns through 15° of longitude every hour.
- He was the first determine the distance of moon & size of moon (radius = 1648 km & modern valve 1738.2 km)
- Use of grid latitude & longitude locating places of earth.

j) **Posidonius:** 'father of oceanography'

He is regarded as the 'father of physical Geography'.

- He assumed highest temprature & driest deserts, located in the temprates zone near the tropics, and 'temp. near equator much less.
- His two important contributions, the one a wrong idea persisted for centuries, & other a correct idea that was overlooked.

'History of plant'

k) Theofretus - 'founder of plant Geography' The pupil of Aristotle who studied the relationship betn the plants and climate.

i) Enxdoxus - Theory of zones of climate.

ii) Pythagoras - Father of analitical geog.

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Greek's contribution:

It is remarkable contributions in the field of mathematical, physical, historical & Regional geography.

(a) Mathematical Geography -

During the Golden Age of Greece determining the shape, size, and climatic zones of the earth.

1. Anaximenders measured lattitud of important places & the pripared first map of the world to scale.
2. Thalse established spherical shape of earth.
3. Herodotus attempted to determine the meridian of longitude.
4. Aristotle argument the spherical shape of earth.
5. Hipparchus determining longitude was by the comparative observations of eclipse.
6. Eratothenese passed the Pillers of Hercules to the extremity of India.

(b) Physical Geography:

Greeks also made remarkable development in the field of physical geography.

1. The Greeks contain numerous references to mountains, delta-building, winds, change of weather, & rain.
2. Greeks opinion that perinial rivers had great sources in great mountain regions.
3. Greeks divided world in to torrid, temprate and frigid zones.
4. The Greeks established a relationship bet^n tempratures and ecumenic regions of the world.
5. Greeks made very carefull observations about volcanoes and earthquke.
6. Greeks scholars also recognised differences in the faung and flora of the different parts of the world.

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B] ROMANS:

"I am not borne one corner;
the whole world is my native land" - Seneca

- The rise of Roman geography took place bet^n 201 BC - 168 BC.
- Roman major contribution was mainly in Historical and Regional Geography.
- Polybius, Poseidonius contributed in the field of Physical Geography.
- Glacken - 'from the original state man advanced through a stage of pastoral nomadism, then through an agricultural stage and finally to the stage of contempory culture.'
- The Romans were great engineers and excellent administrators.
- The built their empire on (i) The Roman law & (ii) Racial equality.

a) Strabo (64 B.C. - A.D. 20) Geographia

He was born in Amesia (Turkey). Strabo is the first who conceived the idea of a complete geographical treatise, comprising four branches:

(i) A traveller geography -

He visited along with 'Gallus' (Roman Governor to syene passing through the Nile valley 24 B.C. The eastern coast of Italy was also a 'Terra - Incognita' to them (unknown world).

(ii) Regional Geography -

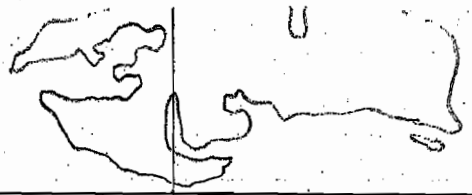
Strabo attempted to present a general picture of each country. He conceived the general features which charactrize the entire area of the world.

(iii) Political Geography -

In his 'Geographia', Strabo examines the pre-requisities for the successful functioning of larger political units and reiterated that a strong central goverment and a single head of state are essential ingredients for political success.

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(iv) Mathematical Geography -

He supported 'Hipparchus' view that it was impossible to make any real progress in geography without the determination of lattitude & longitude.

* His Writings & Contribution -

1) General Treatise -

The general treatise is just on improvment over the work of Eratosthenes' does not carry much credibility.

2) Historical Memoir - (43 volumes)

Strabo work 43 volumes entitled 'Historical Memoir'. He support of Hirodatus view geography & history should go hand in hand.

3) Geographical Treatise (Geographia) -

(i) Vol. I - Introduction of subject matter.
(ii) Vol. II - examine detail work of Eratosthenes.
(iii) Vol. III - covers geography of Spain, France & Britain.
(iv) Vol. IV - describe the Alps.
(v) Vol. V - VI - devoted to Italy & sicily.
(vi) Vol. VII - east of Rhine & north of Danube.
(vii) Vol. VIII, IX & X - devoted Greece & neighbouring island.
(viii) Vol. XI - devoted Asia & Europe.
(ix) Vol. XII - XVI - description of Cappodocia, Asia & Eratosthenes.
(x) XV - XVI - describe the southern Asia.
(xi) Vol. XVII - deals with Africa continent.

- Strabo gave a graphic description of the innudation of the Nile. He tells us that it was caused by heavy rains that fells in the summer on mountains of upper Ethiopia.

4) Encyclopedia of Geography

5) Geographie

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- Geographica - ~~Ptolemy~~ Eratosthenis
Geographia - ~~strabo~~ - ptolemy
synthesis analimy, planetary Hypothesis

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b) Claudias Ptolemy (A.D. 90-168) -

Ptolemy was born in 'Pelusium' (egypt).
His works inspired geographers and explorers of the great age of discovery 1400-1500 A.D.
- Concept of universe :- 'The earth was a sphere that remained stationary in the centre, while the celestial bodies revolved round in circular orbit'.
- This remains accepted doctrine until time of Copernicus (17th A.D.).
- Concept of 'Terra Incognita', was propounded by Ptolemy.

* His Writing :

① The outline of Geography / 'Guide to geography' (8 volume)

i) I vol. - principle for calculating the dimesions of the earth.
ii) II - VII vol. - included tables of lattitude & longitude.
iii) VIII vol - contained map of different part of world.

② Almagast / Syntaxis :

This book mainly deals with the complicated problem of mathematical geography, and astronomy.
- He devoted two parts of 'The Almagast' to a catalogue of stars.

③ Ptolem wrote 'The theory of cartography'

* Contribution :

1) Cartography -

He established geography as an art and science of map making. Ptolemy was 'to reform the map of the world'. He did by adopting a projection for the world map showing the graticule of lattitude and longitude.

2) Astronomy -

According to him, the planet revolved around the Earth. He refined the world map based on astronomical principles.

3) Regional Geography -

Ptolemy described the regions and nations of western Europe at length. The regional geography was enriched by the construction of many roads the countries under Roman empire.

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4) Human Geography:

Ptolemy presents fairly dependable narrations of the tribes in Samatia. Besides a good accounds of the tribes of Taprobane.

5) Physical Geography:

climatic zones of Ptolemy shown on his map. He also study work of river & mountain. Ptolemy can also first plotting of the Gangetic Gulf & Himalayas.

* Ptolemy work criticised:

- (i) The world map prepaired exaggrated size
- (ii) Black sea & Azov are distorted form.
- (iii) The Caspian sea shown as an inland lake.
- (iv) The map shows no connection betn SE Asia & Africa.
- (v) The Indian ocean is landlocked sea depecting.

Dark age (Period of Turmoil) in Europe: (200-700 A.D.)

It was a dark period for the development in Europe 200-700 A.D.

- The advent of christianity in Europe virtually led to the stoppage all reaserch endavors.
- It was considered religion had dominated the mind of people and thase advocated by church.
* The earth became a flat disc with Jerwalem at it centre.
- mainly work on this period: The 'T-in-O' map or the wheel map, St. Beaty's map.
- There was a continious downfall also in the field of Geography.
- Intellectual discourse during the period was guided by theocracy.

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C] INDIAN GEOGRAPHICAL CONCEPTS:

The vaidikas, Ramayana, Mahabharata, the work of Buddhists and Jains, and the Puranas are the main sources of ancient Indian geographical concept.

- The ancient Indian scholars had accurate knowledge of topography, physiography, flora, fauna, natural resources and agriculture.

* Indian Geographer -

It work done by Varahmihira, Brahmgupta, Aryabhatta, Baskaracharya, Bhatila, Utpala and Vijaynadi, has substantially developed on astronomy, mathamatical geog. & cartography.

- सबसे प्राचीन भूगोल ग्रंथ - ऋग्वेद.

Geographical Concepts:

1) Bhogol -

The term 'Bhogol' first time used in 'suryasidhanta' and in the 'Padma Puranas' a differences has been 'Bhogol' (geography), Khagol (space science) and Joytishakra (astrology).

2) The Universe:

The 'universe' has been described 'Brahmand'. The 'Rigveda' mentions a number of gods who performed various functions during the process of creation.

3) Eclipses:

The ancient Indian scholars were also conscious of the causes of 'Grahnas'. It was belived that solar & lunar eclipse occur in same month it become more disastrous.

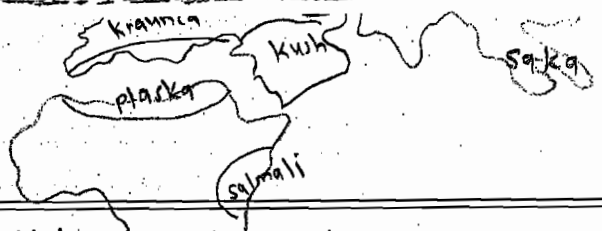
4) Earth:

The word 'Prithvi' has been used 'vedas' and 'Puranas'. Indian litreature signifies the spherical shape of the earth.

Size of earth - It's equatorial diameter - 12,757 km & Polar 12,713 km.

Dimention of Earth	Yojana	miles	kms
① Pancha siddantika	1018.6	8148.8	13038
② Aryabhatta	1050.0	8400.0	13440

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5) Latitude and Longitude -

Indian astronomers were conscious of the importance of 'akshana' (latitude) & deshantra (longitudes).

6) Cardinal points - (दिशा)

The 'Rigveda' principle four direction : Purva, Uttara, Pashima, & dakshina. By adding Zenith (meru) and Nadir (Badvanala), it was raised to six, the designation in 'Saptapadarthi'.

7) Origin -

The 'Puranas' consider the earth to be floating on water like a sailing boat in a river. The earth crust, made of hard rocks (sila), clayey (bhumih) & sandy (asma.).

8) Erthquake :

for earthquake, the word 'Bhukampa' in the Puranas. Similarly knowledge about the volcanoes 'Jawalamukhi'

9) Atmosphere, weather & climate -

The earth was surrounded by 'antriksha', thickness of atmosphere to be 12 yojana (154 km).

- The earth in which winds, clouds, lightnig, fog & rain occurs.
- The Rigveda mention five season - vasanta, grisma, prawrit, sharad & hemant.

10) Continents -

The term 'dwipa' included any land which inaccessible and surrounded by water, sand, swamp, mountain and forest.

Seven -

i. Jambu Dwipa : Jambu tree - in the Pamir.
ii. Kush Dwipa : Kush grass - Iran, Iraq & fringing deserts.
iii. Plaska Dwipa : 'Plaska tree' surrounded mediterraen sea.
iv. Pushara Dwipa : 'surrounded by lakes of lotuses' SE saiberia.
v. Salmali Dwipa : 'silk cotton tree' Tropical Africa & madagaskar.
vi. Krauncа Dwipa : seven important river NW Europe.
vii. Saka Dwipa : cover evergreen forest SE Asia - Myanmar, Indonesia.

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11) **Bharatvarsa:**

Bharatvarsa is commonly identified with the Indian sub-continent. The word 'Ind' or 'Hindy' applied by Darius and Hirodotus.

D) **CHINES CONTRIBUTION TO GEOGRAPHY:**

Chinies made an important contribution to geography, bet^n 200 - 1500 A.D.

- The geographical knowledge in china, the development of paper magnetic needle, trough compass, marine compass and surveying & cartographic skills.

a) **Needham & Wang Ling: (A.D. 267)**

- Suggest that main five type of chines geography:

① Anthropological geographies. ② Hydrographic descriptions
③ Local topographese ④ Geographical encyclopaedias.
⑤ Description of the folk countries.

b) **Chang Heng and Phei Hsiu:**

- The most important contribution in Astronomy & Cartography.
- These two scholars who first developed a scientific method of cartography.

* Three main schools of cosmology & astronomy had emerged:

① The Kai Thien theory.
② The Hun Thien school.
③ The Hsuan Yeh teaching.

I. सिंधु संस्कृती (4000 - 1500 B.C)
II. वैदिक युग (2500 - 1000 B.C)
III. रामायण व महाभारत युग (1000 - 600 B.C.)
IV. बौद्ध जैनांचा उदय (600 - 200 B.C)

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E) ARAB GEOGRAPHICAL THOUGHT :

The medieval period (900 - 1200 A.D.) is considered as 'Golden age of Arab Geography'.

- In 762 A.D. the new city 'Baghdad' is founded more than century remained centre of world.
- 'Caliph Harun-al-Rashid' of Baghdad established an academy called 'Baitul-Hikmq'.
- Arab academics especially translation of the Greeks, Latin, Persian litrature in to Arabic.
- Their main contribution in measurment of Astronomical observations.

* Factors responsible favouring the geographical knowldge were :

(i) Open mindedness : Arab translated all the earlier scholarly works in to Arabic without any discrimination.

(ii) Islamic Brotherhood : The Arab traveller was facilited by brotherhood of Islam which gave impetus to long distant visits.

(iii) The Pilgramages : Under religious obligation muslims undertook journey to 'Mecca' despite to age, poverty and ill health.

(iv) Trade and commerce : Several saying ascribed to the Prophet Mohammad assighed an honourable position.

(v) marine adventures : The Arbs were also opted marine adventures in sea traffic and toade.

- Preserving important writings.
- Expanding geographical knowldge in Europe and Asia.

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a) **Ibn-Hawqual:**

He was resident of 'Baghdad', born in Nasibin. His real name was 'Muhammad Abdul-Qasim'.

- He visited by N. Africa, Sahara, Egypt, Syria, Armania, Azarbaijan, Iran, Iraq, Transoxnia and finally Sicily.
- Ibn-Hawqual entitled book 'Roots and Realms' - in his remarks: "I have described the earth in length & breadth and I have written about the Muslim countries'.

b) **Al Masudi:** 'meadows of gold & mines of precious stones'

896 AD - 956 AD born 'Bagdad' and death Fustat (Egypt).

S.W. - ocean & N.W. - land

- Al-masudi also historian, traveller and a prolific writer.
- He visited wide in the countries of Asia and Africa - Persia to Azarbaijan, caspean sea, volga in central Asia. In SE India & Lanka, the southern part of Madagascar island.

Exploration & Inspection

- His writings: (i) Kitab-muraj-al-Dhahab (ii) Kitab-al-Tanbhwal-Ishraf (iii) Kitab-Akbhar-al Zaman (30 vol.) (iv) Kitab-al-Ausat.
- most of these works, except 'Kitab-muraj-al Dhahab' (Golden Medows) are lost.
- Al Masudi was one of the well known climatologist of his time.

c) **Al-Biruni:**

973-1048 A.D. born in Khwarizum (Khiv) and death on the bank of oxus (syr Darya). His full name 'Abu-Rayhan-mohmmad'.

Rashkil-al-Hind

- He studies the almost entire system of sciences.
- The 11th century has been regarded as the 'Age of Biruni'.

Al Kanam - Al masudi - work on Prairie work

- His writings: Kitab-al-Jamkir, Tarikhal Hind, Athar-al-Bagiya Kitab-al-Saydang.
- 'Kitab-al-Hind: he discussed India belief, litrature, grammer. He translated sanskrit in to arabic original title 'Patanjali'.

1030 A.D.

- Al-biruni as a mathematical, physical & regional geography developed.
- Hindus believed that the tides were caused by the moon.

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d) Al - Idrisi :

1099 - 1180 A.D. born in Ceutta. His name was 'Abu - Aba - Allah - mohammad'.

- He belonged to family of 'Caliph Idrisi'.
- He visited : Lisbon, spain, france, england, sicily, Morocco, Asia minor and interior part of Africa.
- His writings : 'Amusements for Him who Desires to Travel Around the world'. famous for 'silver map'.
- His important contribution a constructed of 'world map'.
- He was extensive correction of erroneous ideas of Ptolemy.

e) Ibn - Battuta : (1304 - 1368 A.D)

Born in Tanzier (Algeria). His name was 'Abu Ibn Abdullah Mohammad Ibn Battuta'.

- He visited : Egypt, Syria, Arabia, Zanzibar, Asia minor, India, china and Java - Sumatra.
- He write : Rihlah, Land and People of china.
- He served at the court of 'muhmmad Bin Tughlaq'.
- The sultan of Delhi appointed to him his 'ambassador of china'.
- He travelled 28 yrs. and coverd area 75,000 miles.

f) Ibn - Khaldun : (1312 - 1406 A.D)

Ibn-Khaldun may be considered last great Arab scholar, He was born in Mediteranean coast of NW Africa.

- His writings : Muqaddimah - 'discription & discussion of human society'.
- The work has been divided six parts:
  - ① civilization, geography & anthropogeography.
  - ⑪ Discussion of nomadic & sedintary culture.
  - ⑪ Dynastics kingdom.
  - ⑭ Life in cities & village.
  - ⑮ Professions means of livelihood.
  - ⑯ classification of science.

- The 1st enviormental determinist who tried to correlate manf enviroment in a scientific way:

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The Impact of Explorations and Discoveries:

* Marco Polo (1254 - 1324)
* Christopher Columbus (1451 - 1506)
* Vasco de Gama (1460 - 1524)
* Ferdinand Magellan (1480 - 1521)
* Captain James Cook (1728 - 1779)
* Varenius (1622 - 1650)
* Immanuel Kant (1724 - 1804)

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- **Immanuel Kant (1724 - 1804)**

- "Give me matter and I will build a world out of it."
- knowldge can be classified logically or physically.
- The logical & physical classification collects all individual items according to similarity of morphology.
- Kant introduced the 'Newtonian law of gravitation' in his theory.
- Kant development his theory accepting the principle of conservation of angular movmentum.
- Kant is regarded by many as the real propounder the 'nebular hypothesis (Gaseous)

'Kant gave geugraphy a central place among science. The farmer, a logical classification, lays foundation for the systematic sciences i.e. Zoology, Geology, sociology'.

- Kant rejected the teleological idea a Critique of Pure Reason.
- Deductive method used in logic and mathematics.

June 09

- **Varenius: (1622 - 1650)**

- Varenius divided geography in to two parts:
  - (i) General Geography - systematic
  - (ii) spedial Geography - Regional
- 'Chorography in his book 'Geographia Generalis'.

- He was one of the 1st scholar to suggest difference in character of physical & Human Geography.

(i) Special Geography -

'The contemporary knowldge of astronomy together & cartography & subjected the differemt theories of his day to sound critical analysis'.

- The Arab scholar described the monsoons and relation of evaporation to rainfall- Al-Masudi.
- In 1510 the Portuguese explorer Albuquerque reached India.
- John Cabot sailed up to- Cape race in New foundland.
- The 'Geography of Puranas' written by- S.P. Chatterjee.

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- The first detailed map of India was prepaired by: Ptolemy.
- One of the first to write on 'Geography of India' was - N.L. Chibber.
- The first Indian Department of Geography was established at - Madras Un
- The chapter of geography in Puranas have been called - Bhvankosh.
- One of the ancient Indian scholars divided earth in to 360° degree was - Bhaskaracharya.
- The description of crop regions based on climate and soil has been done by - Patanjali
- In the Jamby dwipa, the Hindkush existed as - Nishad mountains.
- The fevaurite branch of Greek geographers was - Astronomy & Physical Geograph
- The first scholar declared that earth is spherical - Aristotle.
- The area of intrest of Strabo was - Human Geography.
- The Dark Aag (300 to 1200 AD) there was the influence of - Christianity.
- Just like Eratothenese, an Arab geographer calculate the earth circumferen He was - Abu Zaid.
- The Arab were mainly intrested in - mathematical Geography.
- Ibne-Batuta was the greatest Arab traveller.
- Al-Biruni was the most learned man of his age.

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- Who is known as the father of Geography - Hecataeus.
- The term 'Geography' derived from combination of two-Greek words.
- The famous book 'Indica' was written by - Megasthense.
- The world first climatic Atlas 'Kitab-al Ashkar' - Al Balkhi
- who first ever measured the circumference of the earth - Posidonius.
- Orthographic and stereographic projections are designed by: Hipparcus.
- Which book is recognised as the first systematic description of world - Ges-periodos.
- In T-O map, T - represents; water bodies in the 'Dark age period.'
- Who first ever established the rotation of the earth on its axis - Pontjcus.
- The first cartographer of the world - Aneximander.
- who propounded the theory of zone of climate - Enxdoxus.
- The earth in the centre and all the heavenly bodies round around it who postulated - Hipparchus.
- 'Historia Naturalis' was written by - Pilni. and 'father of Anthropology'.

DATE

II. FOUNDATION OF MODERN GEOGRAPHY : Contribution of German, French, British and American school -

Founders of Modern Geographical Thought -

After the Great Age of discovery, two leading scholars Alexander von Humboldt and carl Ritter made foundation of geography as a period 1750 to 1850.
- 'It is known as " Classical Period of Geography".
- Humboldt laid foundation of 'Plant Geography' and Ritter concept of the 'naturagazen'.
-

A] Alexander von Humboldt (1769-1859) -

He born was 'Berlin' in 1769.
- As a 'naturalist' and 'empiricist' he travelled about 6500 km.
- Humboldt equipped with telescope, sextants, cynometer, gudrants, thermometer and barometer.
- The statment ' History differs from geography in considerat^n of time & space.'

* Adventure and Explorations :

1) Rhinland tour (1789) - contact with 'George Forster', Rhinland Basaltic region.
2) Europe tour (1790-91) - Holland, Belgium, England & france.
3) Study of Geology (1791) - Humboldt joined the school of mines, and he met the femous geologist A.G. warner.
4) Director of mine (1792) - His appointed directed of mine in Prussia, state of franconia.
5) Again Europe Tour (1793-1798) -
   (i) Germany/S. Europe - Baveria, Austria, & Italy observed rock structure.
   (ii) france - measurment temprature of different region.
   (iii) Spain - with the french botanist 'Aime Bonpland' travell mediteran sea to egypt.

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6) Journey to unexplored land :- (1799 - 1804) -

(i) Latin America (ii) Orinoco river exploration, visited cuba, (1800)
(ii) Journey in the northern Andies (1801)
(iii) Climbed chimbaraza peak in Equador (1802)
(iv) visited mexico. (1803)
(v) Returned to France (1804)

7) Research in Paris (1804 - 1827) -

Publications of results of American expendition in 30 vol. are included genral titel : 'Voyage aux regions equinoxiales du Nouvea continent'.

8) Russia Tour : The heart of Saiberia across Urals (1829) -
travelled by carriage at the invitation 'Tsar' -
to explore the mineral resources.

* His writings :

(i) 'The Geology, Relief and climate of central Asia' -
as a result of his Saiberian journey.

(ii) Cosmos : 'sketch of the Physical Description of the Universe'. General presentatn of whole pictum of universe.
based on south America.
(1845 - 1862) : 5 volumes :- I - 1845, II - 1847, III - 1850,
IV - 1858; V - 1862.

* Geographical concept :

1) Unity of Nature -

The phenomena of nature studied in orderd to establish the coherence and unity. It is a organic as well as inorganic material as a bound to unity.

2) Zusammenhang -

In the universe one objed are depend on to another, with orderly. Zusammenhang means 'hanging together'.

3) ~~Earth's surface~~ Earth surface as the Home of man PAGE

4) Geography as the study of relation.

- Humbold belived in the inductive inquiry and mystical research.

5) Science of spatial Distributions of the world.

6) Division of Knowledge:
① Systmatic science - 'Unity in diversity'
② Historical science - deals with existing group of phenomena.
③ Earth science - spatial distribution of phenomena.

7) Concept of Uranography: deals with celestial bodies.

* Contribution in Geography:

① Geomorphology - rock as the resultant in molten material from the interior of the earth, concept of 'Vulcunicity'.

② Climatology - a world map isotherm prepaired first time.
the term of 'permafrost' characteristic of saiberian soil

③ Biogeography - founder of plant geography, He presented distribution of plants in different climatic zones.

④ Historical Geography: a history of man endevours to explore and describe the earth science of anicent egyptians.

⑤ Regional Geography - He sought to identify homogeneous areas however defined. He envisaged and often described the landscap as a whole.

B] Carl Ritter (1779-1859):

He was born in 'Qudlinburg' (1779).

- He was a 'teleologist' and a firm belive in God.
- It was in 1807 Ritter met Humboldt in first time.
- The first chair of geography was created in Germany. He was made as the 1st 'prof. of Geography' [1820] at the University of Berlin.
- His also called as 'Aram chair Geographer'.
- He founded the 'Berlin Geographical Society'.

* His writings:

1) Europe: 'Historical, Geographical and Statistical paintings'
- 2 volumes appeared in 1804 & 1807
- supplimented in 1806 by a -series of six maps.

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2) New Geography:

Manuscript on the 'New Geography (Handbuch der Physischen Geography) 1810: not published
- Because criticism of the 'von Buch'.

3) Erdkunde: German word
- Erdkunde means 'Science of the earth in relation to nature and history'. to strengthen the regional individuality & concept of whole.
- Vol. I (1817) dealt with Africa
Vol. II (1818) was on Asia, total (19 volumes) from 1817 to 1859.
- He was not able to finish his work of Europe.

4) Landerkunde and Allgemeine Erdkunde (Regional Geography)

* Geographical concept of Ritter:

1) Geography as an empirical science.
2) Earth was an organism made.
3) Holastic view with respect to geographical study.
4) Regional geography - earth as an exist together an area.
5) Coherance in the spatial arragment of terristrial phenomena.
6) Concept of 'Unity in diversity'. / unity in multiplicity.
7) Concept of 'Boundry line'.
8) Teleologis approch.

June 06 Telological approch - one of the founder of modern geographical thought. He was a dedicated field worker & believed in empirical research.
- Moreover, Ritter was a teleologist & a strong believer of God.

* 'Give me matter and I will build a world out of it' - Immanual Kant

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Schools of Geography

A) THE GERMAN SCHOOL OF GEOGRAPHY -

- In the 18th and 19th century, the Germans made the geography subject on a sound footing.
- The post Humboldt and Ritter period a definate change.
- The middle of the 19th century, when courses for various physical, biological and social sciences were standardized.
- In Germany, the 1st university was established in 1809.
- At the initial stage, the growth of geography was very slow, because teachers did not proyes geographical background.
- During these period number of geographical societies established.
- In the 2nd part of last century, geographers all over the world tried to define the subject.
- In Germany, great demand on maps and charts by millitercy officers and administrators.

a) Oscar Peschel (1826 - 1875) :-

He became the first geography lecturer in 1871 at Lepzing University.

- Peschel assistant editor of the 'Allgemeine Zeitung of Angsburg'.

He was editor of social journal 'Das Ausland'.

* Physical Geography :

He was foundation of 'Modern Physical Geography'. In his studies of landform and physical geography.

- He ignored man as a important componant of the desciplne of Geography. (Deterministic approch)

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b) Richthofen (1883-1905):

- Richthofen strong attraction of geology, he pleaded the cause of geography. father of Geomorphology.
- He also visited in East Asia & started reasearch in china.
- He was the first report chinies coal field.
- He discovered major resources of china.

* His writings:

① China - (1867 -1872)

Vol I: The structure of the mountains of central Asia.

Vol II: North china

Vol III: South china.

② A large Atlas of china - He could not finish this.

③ morphology of earth surface features - 1886, as a guide of scientific explorers.

* Contribution:

1) Differance bet^n 'General' and 'Regional' geography.
2) Defined geography in a clear perspective.
3) Difference bet^n 'chorology' and 'chorography'.
4) Geomorphology - 'Fishrer fiir forschungsreisende'.
5) chorological conception of Geography.
6) Resource Geography.
7) Geography of man - 'Dynamic anthropogeography'.

c) Friedrich Ratzel (1844-1904):

- His main work was in 'Human Geography'.
- He took his doctorate in zoology, geology and comparative anatomy.
- He is universally recognised 'founder of human georaphy.
- He is best known for his 'organic theory of state' 'Lebensraum'.
- Ratzel was highly influenced by Darwin's theory of evolution of species.

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* Landschaft - S. Passarge
* Sequent occupance - whittlesey.

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* His visits -

1) Europe: (1871-72) he visited Hungary, Transylvania, S. France.
2) U.S.A. & Mexico: (1874-75) - He studing economy, society & habitat of tribes & Red Indians.
3) He focused his attention of Negroes, Africans and Chinese living in central U.S.A. middle west and California.

* His writings:

1) A popular hities of organic world (1869) - A monograph of chinies emigration.
* 2) Volkerkunde (1885-86) - translated as 'The History of Mankind'.
* 3) Anthropogeography (1872-99)
* 4) German Dusland (1898).
5) State - spatial Organism.

* Contribution: study of harmonious reciprocal relation of man & nature

1) Anthropogeographie - effect of different physical features & locations of Human life.
Vol. I - is a study man & earth relationship.
Vol. II - influence of man on enviorment has been discussed.

2) Deterministic approch -
He applied Darwin concept 'survival of the fittest'. This is known as 'social Darwinism'. / social Determinism.

3) Political Geography -
Ratzel wrote 'Political Geography' in which he compared 'state' to an organism. 'organic theory of state & society'.
- He emphasized fact that a state, like some simple organism, must either grow or die and can never stand still.
- It was this philosophy called 'lebensraum', (living spaces).

* It was Ratzel who tried to build a 'fundamental unity in diversity'.
* Ratzel study of the modes of life of Germans living outside Germany (Hungery, Italy, Spain France).

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d) Alfred Hettner (1859-1941):

- He was basically physical and regional geographer.
- He completed his doctorate on the topic 'climate of chile and western pantagonia' under guidance of 'Geoland' (1881).

* His writings -

① Europe (1909) - He support geography as a chorological science.
② 'The Geographische Zeitschrift' (1895-1935)
③ Comparative regional geography 8 vol. (1933-35)
④ Handbuch der Geographischen Wissenschaft (17 vol.)

* Contribution:

1. Established geography as a 'chorological science.'
2. Rejection of dichotomy: Regional vs systematic.
3. Explication of philosophy of geography.
4. Development of political geography cum 'geopolitik'.
5. Concept of 'chorology'.

e) Albrecht Penk (1858-1945):

- Penk was formulated concept of 'geomorphology' was trained in geology.
- He founded the 'principle of landform evolution'.
- Penk introduced term 'Gestalt', borrowed from Psychology in Geography.
- His opinion 'geography is a bridge bet^n the natural & social sciences.

* His writings:

1) A book on Ice sheet Theory (1882).
2) Das Deutsche (1887)
3) Morphology on the earth surface. (1894).
4) Physiography (1905)

* Contribution:

1. Encouraged unity of geography.
2. Development of modern physical geography.
3. Regional Geography.

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B] THE FRENCH SCHOOL OF GEOGRAPHY:

- In the middle of the 19th century, in france as in Germany, geography was taught by historians, geologists, military persons and engineers.
- Even chair of geography in 'Sorbonne' was occupied by historian.
* Phillipye Buche (1752) - was the 1st french schollar representation of population, economic & other data in administrative units.
* Omalius d'' Halloy (1833) - prepared geological map of france.
- In 1870 time major breakthrough in the expantion of geographical knowldge.
- Several geographical socities were established in vertous universities of france.

a) **Vidal de Lablache (1848 - 1918):**

Vidal is known a 'founder of Human Geography'.

- He was strong critic 'enviormental deterministic approch'.
- He was studying archaeology at Athens.
- He developed of 'new geography' in france.

* **His writings:**

1. Annals-de-Geography: (1891) collabration with 'marcel Dubois'. main aim french colonies knowldge to study in french people.

2. Atlas genral vidal la blache: (1894) there are 5 edith of Atlas. Atlas showing political, physical, elimatic properties on graph.

3 Geographie Universaile: is a specific science. These book complete 'Lucien Gallois' black student. 1st part explain - British iceland and IInd - European countries.

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4. Tableau de la Geographie de la France (1903): literature of geography. He also tried to synthesis 'pay'.

5. Principle of Geographic Humain (1922) - published sun-in-law De-martone'. Human Geography followed by study of it's setting, localization and correlation.

6. 'The La France, The La East' (1917).

* Geographical Concept:

1. Possibilism - These concept fully developed by 'Lucian febvare'.
"nature is never more than adviser"
"There are not necessities but everywhere possibilities"

2. Pays - 'small geographic Region'. A micro-region having homogeneity in physical and cultural phenomena, used by Vidal in his study of the massif of france.

3. chorology - The study of areal differentiation of the earth's surface (regional geography).

4. Other - (i) Social organization.
(ii) Geography as a natural science.
(iii) Genre-de-via (lifestyle).
(iv) Geography as more scientific discipline.
(v) 'Principle of Terristrial unity' / Terrestrial whole.

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5. Genere de-via: / lifestyle -
- The product & reflections of civilization represented in the integral result of physical, historical & social influences surrounding man's relation to milieu in particular place'.

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b) Elisee Reclus (1830 - 1905)

- Reclus was first and foremost an uncompromising idealist.
- He was travelled in North and south America to do reasearch.
- He was the most successful of Ritter's students.

* His writings :

1) La Terre (1866-67) - a work of systematic physical geography.
2) Nouvelle Geographie Universelle - Regional Geography.
3) New physical geography - (1890) : Earth, atmosphere, ocean & life.
4) L' Homme et la Terre - described as social geography.

* Contribution :

(i) He also a connection bet^n geography and modern town planning and sociology.
(ii) He asseated that man is not product of his enviornment but an important part of it.
(iii) He discussed man - nature interrelationship in a very scientific way.

c) Jean Brunches (1868 - 1930) :

- Brunches was disciple of Vidal de Lablache.
- He prepaired conceptual framework of 'Human Geography'.

* His writings -

1) Geographic Humaine (1910) : Geographic Humain de la france.
2) La Geographie de l' histoire (1921)

* Contribution :

1) Scope of Human Geography -

(i) unproductive occupation of soil.
(ii) things connected with the plant & animal world.
(iii) the distructive economy - 'robber economy'.

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Phillippe Bauche - was the first french scholar, who criticized the prevalent method of representation of popln. economic & other data in administrative units.

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2) Principle of Activity:

- He heald the view that 'everything is either growing or diminishing'. 'expanding or shrinking' and nothing is 'stable and static'.

3) Principle of Interaction:

- All the physical and human forces are thus closely bound together because of the endless interelations of the conditions they bring out.

4) Albert Demangeon (1872-1940):

- He contributed to Transport Geography, Population and International Economies.
- He produced a monograph entitled - 'La Picardie et les regions veisines'.
- He also made a classification of lands and prepared land use maps.
- He also wrote 'Transport Geography'.
- He made usefull contributions to 'Rural settlment of France'.

5) Emmanual de Martone (1873-1955):

- He was pupil and son-in-law of Vidal Blache.
- Martone specilized in Physical geography and his special area was central Europe.
- He had recived training in geology, geo-physics and biology.
- He studying 'glacial erosion problem of Alps.'
- Book: 'Traite de Geographie Physique and La France Physique'
- He inspired french geographer to work in Physical Geography.

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C] THE BRITISH SCHOOL OF GEOGRAPHY

- Geography was introduced in educational institutions at a very late stage, in school and collages of Britan.
- In middle of the 19th century, academics were busy in accumulating facts and information about the newly discovered place of world.
- In 1859 'Darwin' published 'Origin of Species' which attracted biologist, geologist, sociologists and geographers.
- In the end of 19th century geography was introduced in British universities.

a) Halford J. Mackinder (1861-1947):

- Mackinder as the founder of 'British school of Geography'.
- He was the 1st recorded person to climb mt. Kenya.
- He considers geography as a bridge bet^n History and Geology.
- He interpritation world political affairs.

* His writings:

1) Britain and the British sea - (1902) is considred a classic in modern British litrature.
2) Democratic Ideals and Reality (1919) - he discussed world power politics.
3) Realm of Nature - he discussed races of man.
4) The Round World and the winning of Peace' (1943)

* Contribution:

① Geographical Pivot of History (1904).
② Heartland Theory (1919)
③ Round world and winning of Peace (1943)
④ Other - Regional, Economical, Historical & Enviormental Geography.

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b) **Sir Patrik Geddes** : - concept of 'conurbation'.
- The scotish geographer was a follower of 'Le Play'.
- He was founder of 'British Regional studies'.
- Geddes was the founder of the 'le Play society'.
- The idea that the geography is not a mere descriptive science, it is an applied science.
- 'Quantitative Revolution' in Britain popularised by Geddes.

c) **Herbertson** (1865 -1915) :
- French school of Geographers worked on meteorology and oceanography.
- Mainly work on Regional Geography :
  (i) Regional Geography of world (1905)
  * (ii) world divided into to 15 natural region.
  (iii) He read paper entitled 'major natural region'.

d) **Other** :

1. Roxy - Man's relationship to physical enviorment.
2. A.G. Ogive - Great Britain 'Essay in Regional Geography'.
* 3. H.R. mill - General Geography.
4. L.D. stamp - General Geography and commercial geography.
* 5. w. smith - Economic Geography of Britain.
* 6. Chisholam - Commercial Geography.
7. Buchannan - Pastrol Industries of New Zeland.
8. J.D. stamp - 'unit area' land use survey in Britain.
   use and misuse of land.

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D] THE AMERICAN SCHOOL OF GEOGRAPHY

- Geography as a subject matter in American school & collages was diffused by Europeans in middle of last century.
- 'Arnold Guyot' of Princeton, was the Ist professor of Geography in America. He was a 'teleologist'.
- The American Geographical Society was started in 1851.

a) William Morris Davis (1850-1934):

- He was founder of Association of American Geographers (1904).
- He developed 'theory of cycle of erosion' which he defined as 'geomorphological cycle'.
- Davis was a critic of human geographers. 'enviormental Deteministic'
- Davis attitude in geography passed through both phases - deterministic and ecological.
- He was one of the pioneers in the field of geomorphology, who tried to bridge the gap betn geology and geography.

b) Mark Jefferson (1863-1949):

- In America, he was the founder of the 'real-man oriented geography'.
- The concepts of 'central places' the laws of 'primate city' and 'civilizing rails' were coined and identified him.
- He stated geographical concern was with men: 'where they are', what they are like, and why they are there.
- He was pupils of W.M. Davis., His geographical study 'Notes on the state of Virgina'. (1787).

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c) Isaiah Bowman :

- Isaiah Bowman was one of the product of Jefferson.
- He was travelled in Andes, Peru, Bolivia and Chile.
- work: 'The geography of central Andese'.
  The pioneer fringe - stated the nature of problem.
- He was enviormental deterministic, but later importance to role of man:
  'man is changing himself as well as the world as he goes along'.

d) Ellen Churchill Semple (1863-1932):

- She was pupil and followers of Ratzel.
- She visited Japan, china, Philippines, Java and India.
- she was one of the important protagonists of the enviormental determinism.

* His writing :

1) 'Appliachian Barrier in American History' (1897)
2) American History and its Geographical conditions (1903)
3) Influence of Geographical Enviorment (1911).

* Deterministic approch :

'man is the product of earth surface.' This means not merely that he is a child of earth, dust for her dust; but that the earth has mothered him, fed him, set him to task, directed his thoughts, confronted him with difficulties that have straightened his body and sharpened his wits given him problems of navigation or irrigation and at the same time whispread hints to solution'.

'Human Geography is the study of changing relationship betn unresting man & unstable earth'.

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e) Albert Perry Brigham:

- He was intrested in geology and geomorphology.
- He was assertions of climatic influence on racial character, and man constitutions.
- He interpret similar human phenomena in different climates and regions of the world.

f) Carl O. Sauer (1889-1975):

- The Founder of the 'Barkely school of geography' in California.
- Carl Sauer was one of the leading American geographers of the 20th century.
- He rejected the 'enviormental determinism' of Ratzel & semple.
- The term 'landscape' introduced by Sauer in (1925).

* His writings:

1) The morphology of Landscape.
* 2) Landschaft).

g) Ellsworth Huntington (1876-1947):

- Huntington, a pupil of Davis, he was thinker and prolific writer.
- He was the search for "the effect of climate on human life."
- He travelled in N. Africa, Euroye and south America.
- Huntington emphasised the importance of 'climatic determinism.'

* His writings:

- Pulse of Asia - (1907): was appriciated all over the world.
- Civilization of climate (1915): the civilization develop only stimulating weather.
- Principle of Human Geography (1920): a textbooks.

climatic influence are persistant often obdurate in their control.

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* Deterministic approch :

"The have the kind of energy which is needed for innovations, trying new methods and carrying out reforms. In an 'invigorating climate, it may be easier to be honest and sober and self controlled than in a more enervating one'.

i) Rollin D. Salisbury :

- He established & organised the department in geography of the Chicago university.
- He was keenly intrested in physical geography.
- His main work 'Physiography' - is a classic on the evolution of landforms.

Paper II

RECENT TRENDS IN GEOGRAPHY

DATE

1. • Trends of development in Geography in 20th century.
2. • Geography as a study of spatial organization, structure, Pattern and Processes.
3. • Concept of space, area, region and basis for regionalization
4. • Man - Enviormental relationship with refrence to determinism and Possibilism.
5. • Kuhn's Paradigms in Geography, Areal Differenciation,
6. • Exceptionalism in Geography, spatial & Locational analysis.
7. • Postmodernism, Globalization, Radicalism, Positivism, Behaviouralism in Geography.
8. • Geography as a scientific discipline, needs and significance of models in Geographic Reasearch.
9. • The Emergence of Geography as a formal Academic Discipline from Varenius to Kant the reapperance of formal geography.
10. • Explaingations in Geography - (i) Cognitive Description (ii) Morphometric Analysis (iii) Course and Effect Analysis (iv) Temporal Analysis (v) functional & Ecological Analysis.

Refrences:

Husain Majid: Evolution of Geographical Thought
Models in Geography.

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* Conceptual and methodological Development ; During 20th Century :

- The Twentieth century introduce an era of the rapid development of interest in the study of natural sciences as ordered observation an against the older philosophy.
- In the beginning of 20th century geography was considered as an all embracing science of the earth.
- In the mid of the twentieth century people began to think in terms of specilized studies of special desciplines.
- The main stream of geography as 'chorographic science'.
- Geography was splitted in to many branches physical geography, Regional geography, Political, Regional geography, Cartography, surveying and inventories.

a) **Richard Hartshorne :**

"As a disciplune geography is conserened to provide accurate, orderly, rational discription and interpritation of the variable character of earth surface".

* founder of Exceptionalism.

* **His writings -**

1) The Nature of Geography. (1939)
2) Perspective in Nature of Geography. (1959)
3) Annals of American Geography.
4) Survey in litrature.
5) राजकीय भूगोलाचा आधुनिक विकास (1934)

* **Contribution :**

* 1) Areal Differenciation
2) Concept of choronology.
3) Regional Geography.
4) Empirical observation.
5) Pattern of each phenomena.
6) Spatial Distribution.

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b) Charles Bungay Fawett (1883-1952):

- He was the head of 'Geography Department of Srilanka at Colombo' (1951-52).
- books on (i) 'frontiers: a study in Political Geography
  (ii) Political geography of British empire. (1933)
  (iii) Geography and empire.
  (iv) Politische Geographie (1897).

e) Griffith Taylor (1880-1963):

- He also worked along with 'Edgeworth David' and 'Douglas Mawson' and appointed Demonstrator in Geology.
- He was very controversal figure during the inter war period regarding the 'white settlment in Australia.'

* His writings:

① work in Geography: Enviorment, Race and migration.
② American Geographical Thought.
③ Australia Physiographic and Economic.
④ Geography of 20th century.

* Contribution:

① Concept of Neo-Determinism (Stop & Go Determinism).
② migration zone Theory.
③ Geographical work in Cultural, urban, settlment, & Racial Geography.
④ He was 'climography' and Hythergraph constructed.
⑤ Pragmatic Possibilism.

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- **David Harvey** -
  - Concepts of Human welfare; Ideographic and Nomothetic.
  - Explanation in Geography: (1969) -

'It was a landmark text in the methodology and philosophy of geography, applying principle drawn from the philosophy of science in general to the field of geographical knowledge'.

Petter Hagget -

- ~~Theories of location allocation model~~.
- But after its publication 'Harvey moved on again, to become concerned with issues of 'social injustice & the nature of the capitalist system itself.'
- To the critique of absolute space & exceptionalism in geography of the regional historical tradition that he saw as an outcome of Kantian synthetic a priori knowledge.

Dec. 08

- Petter Hagget: (1933)
  - P. Hagget is an eminent 'British geographer' & academician.
  - His significant reasearch contribution to the field of human geography.
  - He was author & editor of over 30 books on geographical practice, theory & individual research topics.
  - He is most particularly associated with the University of Bristol when he has lecturer & protessor of geography.
  - Hagget was made a award by 'Commander of the Order of British Empire; Theories of location allocation model.
  - Hagget specilized in the geographical study of epidemiology & classmate the spatial relationship & distribution of PAGE infectious diseases.

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① Trends of Development in Geography in 20th century :

* Introduction :

The development of geography as a scientific discipline, it is necessary to tress this development through various periods and also contribution of various geographers. Geography has a longer geneology than any other sciences. The earliest records of man's ~~intrest~~ interest in the nature of the physical world around him contain observations and speculations of geographical type.

* Historical Perspective of Geography :

- The word 'Geography' 1st ly used by 'Eratothenis' in 3rd century B.C. It arrives from Greek words 'Geo' & 'Graphia' means 'earth' & 'discription' respectively. Therefore, 'Geography is description of earth'.
- The medivial period (7th century B.C.) is said to be an age of 'seen' and 'reaserch' for the development of 'Geography'.
- During the 15th & 16th century traders, travellers and explorers play a vital role in the geographical discoveries and explorations of continents.
- The end of 18th century 'Humboldt' & 'Ritter' laid foundation of 'Modern Geography'. The distribution or phenomenas on the earth surface of their caused explaination as the 'cause and effect' relationship.
- Thus modern geography not only describe the surface of the earth and its various features i.e. physical & cultural but also investigates correlations betn phenomenas of the earth surface.

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Trends of Geography in 20th century :

'Freeman' in his book- 'Hundred Years of Geography' attempted a history of discipline and identified ten major trends of development in Geography in 20th century. These are as follows :

1. The Encyclopedic Trends -

This trend is related to the exploratory activities of man. This is associated with the 'collection of new information'. In this period, attempts were made to know the parts of the world, which was not know to the European 'Terra in cognita'

'Royal Geographical Societies' some trends, explorers and individual personalities like collect new data about unknown parts of the world.

collect new information

2. The Educational Trends -

The Geography become a accademic discipline in 18th century, and was also introduced in college and University level. In the university level Geography Department was established in Germany, Britan and U.S.A.

Geography was introduced in the school as the subject of primary and secondary level. so attempts were made to introduce geography in the education, for the purpose curriculam was formed teaching & training were there

subj. introduce college & univer.

introduce geog. in educat'n

3. The Colonical Trends -

During the early centuries world was the under British Empire moved in different direction for trade & merchantative activities and latter on established their rules.

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different envir. knowledge collect

They established their rule in America, Africa, Asia and Australia. etc and all these are known as the colonies of the British. India is also a colony of British.

All these colonies were in different enviorments so different types of geographical knowledge was collected by them. Example: land, water, people etc. During this period such type of 'Gazetters' are important.

4. The Political Trends -

Heartland, Lebansrum, 2nd world war -

Experts in Geographers was used geographical knowledge in political offices and this is called a political trend. Geographical knowledge was used for political purpose for 'solving the political problem'.

- 'Theory of Heartland' inform the view of political strategy.
- Geographical knowledge was made use for solving boundry problems of many nations.
- German's (Nazi) were advocated the concept of 'Lebansrum' (living state).
- Political Geography study also helpfull to Ist & IInd world war.

5. The Generalization Trends -

data systematically arranged.

Due to encyclopedic and colonical trends collection of new facts and data is there. But this data and facts were systematically arranged in this period and these gathered facts or statments.

Example - 'Koppen's climatic classification'

In this way classification of climate, vegetation, soil etc. In the begning of 20th century the generalization trends was dominated in geography.

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6. The Specilization Trends -

Variety of new informatn about various aspects was collected. out of that some people try to concentrate on certain aspects in detailed. 'To get large amount of information they study it with greater depth and it called as the specilization' trend for Geography.

various aspect collected & concentrate certain

Example - microclimatology, coastal Geomorphology, Regional Geography in Maharashtra etc.

7. Cartographic Trends -

It is important technique used by geographers. There are revolutionary change in this technique after 1950. Because use of the Areal photographs, satellite imageries and also computer analysis and printing revolution. Computer application can advance mapping techniques G.I.S & G.P.S.

revolutionary change

- Satellite imageries are accurate and large area cover.
- World map developed very easily.
- Animal and resources study essily.
- It's method used 'urban planning.

8) Population & Demographic trends -

In 1953. G.T. Trewartha introduced population geography as a new branch of Geography. It studied population indicator & their characteristics.

pop^n indicators & characteristics

Trewartha, Garnier, clerk, wooldridge are also contributed the growth of this subject. Then some modern geographers who have given some fresh anlayse of demographic trends.

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9. Enviormental & Ecological Trends –

The facing maximum enviormental problem due to human interference basicaly after the world war IInd. Enviormental problems like indu pollution, global warming, sea level rise, ozone deplation, land degrdation due to cause of industralization, urbanization, population growth, transportatn etc. So this trend is study in Geography because this subject matter man - enviorment relationship.

enviro problem
man - envi. relationship

* So Geographers study:
  - Saftey condition of enviorment & ecosystem.
  - resource utilization & its conservation.
  - Solve the enviormental problem e.g. pollution.

10. Therotical, Philosophical and Geographical Trends –

In modern geography philosophical role is very important David Harvey, William Bungi, L.B. King, are the most important philosopher after 1950. Carl-o-Sooquer' is change thus view from old to new geography.

* modern Geographers contributed concepts -
  i) Locational, Regional analysis.
  ii) Positivism, Behaviourism, Humanism & Radicalism.
  iii) Diffusion & system analysis.

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Pareto Optimality : (पॅरेटो इष्टमान) -

'The policies of distribution in favour of the poor or socially deprived can be implemented only at the expense of the rich, or better-off member of a society.'

- This known as Pareto optimality a situation in which it is impossible to make some people better-off without making other worse-off'.

* समाजातील दरिद्री व उपेक्षित लोकांसाठी श्रीमंत व सुसंपन्न लोकांकडून त्यांचे मूल्य वसूल करून सोयीची कार्यवाही करणे, याला पॅरेटो इष्टमान असे म्हणतात.

'काही लोकांना हानी पोहचल्याशिवाय अन्य लोकांचे भले होणे शक्य नाही'. * *

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'Place, work and family' explains that 'the family is the unit of the society'- This monograph written by: Fredric Le play.

Fenneman's circumference of geography; regional geography is heart of the science

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- 'Principle of Human Geography' was written by: Ellesworth Huntington
- Who started the landuse study and proposed landuse of maps in Britain - L.D. stamp. 'The Geography life and Death'.
- 'Crowded Earth' was written by: Pranav Gupte.
- Who wrote the famous eassy 'scope and aim of Human geography'-Roxby
- Practicle and scientific method were developed for the first time - Mishul
- Reine geography was - description of natural region of the earth rather than political region.
- Ratzel said- "I travelled, I sketched, I described description of nature."
- Who said that 'man is a constituent part of nature and earth is the home of man' or organism - Alexander von Humboldt.
- Who said - 'similar location to similar made life'- Ratzel. & compaire state to organism.
- The statment 'civilization is the product of moderate climatic adversity'- E. Huntington.
- The statment - 'Determinism is the most indispencible facet of Dilectional Thought' - Anuchin.

Concept of 'Lebensraum' was propounded by - F. Ratzel.

Richthofen major work has been related to- China.

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- Who first ever used the term 'chorology for regional study - Ritchthofen.
- The founder of Political Geography was : Friedric Ratzel.
- Who propounded the 'Principle of landform' - Albert Penk.
- The book 'Problem of Human Geography was written by - Demangeon.
- The father of modern Geography and climatology : Alexander von Humboldt.
- The father of 'Regional Geography' : Carl Ritter
  foundation of Regional Geography - Hecateus of miletus
- The father of 'physical Geography' : Emanual Kant
- The father of 'modern physical Geography' : Oscar Paschal.
- The dichotomy of the physical vs Human geography was started during : Ratzel Region.
- The foundation of the dichotomy of systematic and regional geography : Verenius.
- Who was the first professor of geography in Germany : Oscar Paschal.
- Who was the Ist geographe world divided into to 14 natural regions : Herbertson.
- Use of models in Geography started by : Richard chorely.
- The world first Geomorphologist - M.V. Lomonosov
  ↳ father of Russian Geology

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⑤ CHANGING PARADIGMS

① "Universally recognised scientific achivment that for a time provide model problems and solutions to a community of practioners."
- Thomas Kuhyn's

⑪ "The working assumptions procedures and findings routinely accepted by a group of scholars, which together define a stable pattern of scientific activity, which in turn defines the community that share in it."

⑪ Paradigms called as a 'kind of supermodel'. - P. Hagget.

- Like 'Geology' and 'Economics' geography has passed from the 'descriptive to model formulation stage.'
- This process started in 19th century & accelarated the end of the 20th (1960-70's) century.
- Change in Geography through -
  - ① the descriptive
  - ⑪ classifactory
  - ⑪ law making stage (theory building).

1) Geographical law as a universal - Geographical laws are not identical to natural laws which are universal in character and can be applied with confidence in any part of the world.
Example - The law of gravity can be tested in India, America, Europe, or Aus with equal validity.

2) Exprimment in Geography - Geographical laws can be tested only in the field where conditions are not controlled.

3) Poinciple of activity - means that every phenomenon is changing in time and space.

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- Geography, like other discipline, is passing through phases of chaos and tranquillity, as pointed out by kuhn.

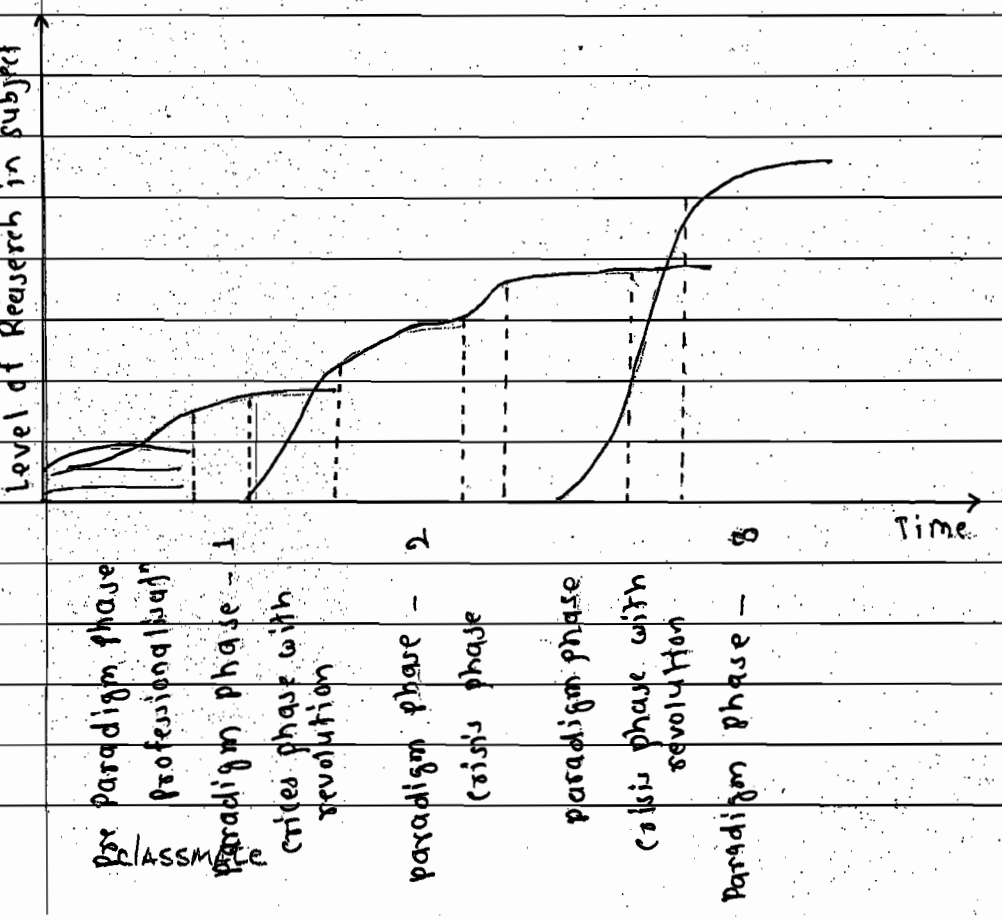
* Kuhn's Paradigm:

'Thomas Kuhn's was a American historian postulated a very important theory about 'growth and development of science'.

- In order to elucidate this process of development of sciences, kuhn prepared a model which termed as the 'paradigm of science'.

* Define: "universally recognised scientific achivments that for a time provide model problem & solutions to a community of practitioners".

- A Geographical Interpretations of Kuhn's Theory of the Development of Science (After Henrikgen 1973)



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- Kuhn in his postulate development of sciences consists of:
  Pre Paradigm Phase → Professionalization → pharadigm phase 1 →
  Crisis phase with revolution → Paradigm Phase 2 → crisis phase
  Paradigm phase → crisis phase with revolution → Paradigm phases.

1) Pre Paradigm Phase -

conflicted school data collection, low level specialist

(i) Conflict among several distinct school which grow around individual scientist.
(ii) This period collection of data over very wide field.
(iii) low level specilization.
(iv) One school thought does not consider 'scientific' than other.

2) Professionalization:

dominant thought new research mathematics & astronomy

(i) A perticular school of thought became dominant.
(ii) New reasearches make progress.
(iii) mathematics and astronomy left the pre-paradigm phase.

3) Paradigm Phase:

school thought dominant, research.

(i) a daminating school of thought, quite a short space of time.
(ii) Paradigm established concentrated reasearch within a clearly distinguishable problem area.

4) Normal science phase -

turmoil, dark phase, crisis phase.

(i) there occurs stagnation in reasearch which leads to turmoil.
(ii) It says 'temporal dark phase', in the development of scientific knowldge.
(iii) A period of 'Normal science' is sooner or later replaced by a crisis phase.

5) Crisis Phase:

(i) It is charactarised by a reassessment of former observational data, new theoratical thinking & free speculation.
(ii) The crisis phase ends when a new paradigm attract a growing number of reasearchers.
(iii) The acceptance of new paradigm, it becomes revolutionary phase.

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* Merits of Kuhn model :

① It provided an opportunity to the yonger researches workers to postulate new theories.

② It is declare their paradigm objective.

③ This model provided simple and popular theories.

* Demerits :

① This paradigm against the positivist approch or scientific research.

② This paradigm gives useful guidelines for the understanding of the historical development of a subject, But does not offer a complete explanation.

1st year of determinism

Geographical Paradigms : A historical Perspective-

- Geography had passed from the descriptive and teleological phase to quantitative, radical and dialectical metarialism stage.
- The types of models and paradigms that developed in geography during the last 150 years.

1) Period of Carl Ritter :

founder, ideology not taking

① Carl Ritter as a founder of modern geographical thought and an advocate of empiricism.

② He used inductive method and teleological view.

③ The major problem teleological philosophy can not be tested empirically and not qualify scientific explaination.

2) Period of Darwin (Pre Paradigm Phase) :

① 'Darwin' revolutionized the entire philosophy of science brought a cause and effect approch.

② Darwin foundation of deterministic approch in geography.

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(iii) In his opinion, the natural conditions determine the socio-cultura development of society.

8) Period of After Darwin (Professionalization):

(i) After Darwin, scientists were looking for controlling law of nature.

(ii) At these stage deductive method used. deterministic approch

(iii) The theories postulated about the evolution of landform, normal cycle of erosion and Heartland under the geographical model.

4) Period of Vidal de Lablache (Paradigm phase-1):

(i) Blache and his followers laid stress on possibilism and declared that man is a not passive agent.

1st paradigm- determinism

(ii) A large number of micro-level studies were conducted which coas a regional approch. pays concept

(iii) Kuhnian geomorphology and determinism represented first paradigm phase in geography.

8) Period of After Blache (revolution phase):

(i) Possibilism and regional geographical school developed new paradigms and became very popular.

(ii) The deterministic explanatory model survived side by side with possibilism.

(iii) Kuhn has termed this period of 'revolutionary phase'.

8) Period of Regional study (crisis phase):

(i) 'George Chabot'- regional geography is centre around the everything converges.

(ii) Regional geography flourished in france and neighbouring countries.

(iii) A period of crisis in the decipline emerged.

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7) Development of Paradigm (New paradigm phase):

① Quantitative revolution and functional approch in geography.

② The development of geographical paradigms, model, laws and theories, it may be infered that complete revolution in geography.

③ Geographers divided in the categories of positivists, idalists, realists and dialectical materialists.

④ This is a 'crisis phase with revolution' which shall lead to new paradigm phase.

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④ MAN AND ENVIORMENT

* Geographical Concepts:

1) The geographers to generalize the patterns of human occupations of the earth surface depend on enviormental conditions.

Human occupation, activity, behaviour, history, culture depend on environment.

2) The human activity controlled by the parameter of the physical enviorment within which it was set.

3) Human behaviour around the world can be explained by the differances in the natural enviorment.

4) The history, culture, living style and stage of the development of a social group or nation are exclusively or largely governed by the physical factor of enviorment.

* Charles Darwin: 'Origin of species' (1859) -

Darwin belived 'survival of the fittest'; and saw 'man' as the end-product of evolution.'

- The natural selection of types according to their capacity to adjust themselves to physical enviorment.

* Approches to Nature-man relationship:

1) Humanity in harmoney with nature -

The dominant theme was 'man was supposed to live with nature'. In this process resources of the natural enviorment were not disturbed beyond the natural capacity of enviorment. Such enviormentalism conservation of resources.

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2) Humanity as determined by nature:

It relates to the influence of the enviorment on human activity. It can expressed symbols as: (E → H)

3) Humanity as modifier of nature:

It is based on the premise that 'human activity may alter a given enviorment.' It can be expressed symbol as; (H → E)

climate impact

human

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Enviorment Determinism :

— Ellsworth Huntington

① 'The doctrine that human activities are controlled by the enviorment'.

- The concept of enviormental determinism was dominant in American universities and largely work on 'Ellsworth Huntington'.

② - "Enviormental determinism proclaim that climate and terraine are the dominent forces in determining cultural direction."

climate & terrain impact on culture

Example : - People of temprate climate as a Europe and N. America have clear, quick mind, creativity and high level of industry Because of the bracing winds and seasonality of the mid lattitude.

temprate & tropical climate -

- On the other hand, individuals of hot, humid and seasonally unchanging weather of tropic would be lethargic and lacking energy.

③ "The belief that variations in human behaviour around the world can be explained by differences in the natural enviorment is known as enviormental determinism".

— Charles Darwin.

1. Fedric Ratzel -

He was the schollar put forth by concept 'Determinism'. He has described that the 'human lifes and its activity are controlled by physical enviorment.'

human life & its activity

2. Ellen Semple —

'man is product of earth surface'. The process of diffusion of new ideas and innovations in the hilly tracts of isolation and relative isolation slow as compared to the well-connected plains of the world.

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3. Ellesworth Huntington :

climate fundamental factor -

Huntington belived that out of all the factors of natural enviorment, climate was the fundamental factor in the rise of civilization.

e.g. N. America & Europe which showed temprate climate had the higest level of 'health & energy' and civilization.

- The effects of climate on human life.

envoi. & opportunity people

4. W. M. Davis :

envoi & relat^n of behaviour.

The relationship betn the physical enviorment and human behaviour. Reflective of the thinking at that time, Davis concludate that the physical world controlled human behaviour.

6. Mackinder :

physical feature direct human activity.

The influence of the physical enviorment on humans. He contended that no other deeipline dealt with the interface of the natural world and human culture and geography must take up that function of geography.

- mackinder further stated that the function of geography was to show physical causes directed human activity.

- Subsequent geographers like ~~chisholm~~, ~~Brunhes~~, ~~Bowman~~, Cvijic, Semple, Huntington, Taylor etc.

6. Humboldt

7. Darwin

lifesty

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Possibilism :

g]

"The view that the physical enviorment provides the opportunity for a range of possible human responses and that people have considerable direction to choose between them."

envoi: provide opportunity & peple choose

- Possibilism developed as a reaction of enviormental determinists that led to counter thesis, of possibilism.
- The 'man as a active rather than passive agent, in enviorment.'

1. **Lucian febvare :**

This point of view was named 'possibilism' by Lucien febvare', who writes : 'There are no necessities, but everywhere possibilities'.

- According to febvare - a possibilist, 'man is a geographic agent and not the least. He everywhere contributes his share towards investing the physiognomy of the earth with those changing expressions which is the special charge of geography to study.

2. **Vidal de Lablache :**

Vidal refuted the concept physical determinism and advocate possibilism.

"Nature sets limits and offers possibilities for human settlment, but the way man reacts or adjusts to these conditions depends upon his own tradition way of life."

lifestyle

① genre de vie - The same enviormental has different meaning for different genre de vie' (lifestyle).

② Pay cost - man with his technical skill can grows or cultivated any thing any where. If man is ready to pay cost.
e.g. wheat crop are cultivated on tropics.

- ~~Assume~~ that the 'nature sets limits & offers possibilities for development & man's adjustment to nature.

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3) Jean Brunches:

Brunches further writes: 'Nature is not mandatory but permissive'

Brunches Remark: 'The power and means which man has at his disposal are limited and he meets in nature bounds which he can not cross. Human activity can within certain limits varies its play and its enviorment, but it can not do away with its enviorment.'

4. Isaiah Bowman:

'Geography and social sciences' - Bowman stated 'As the knowldge of world spread, of association of event or condition with place widened, they became more significant with respect to mankind'.

Example: The Potato & maize plant were unknown to pre-Columbian Europe.

5. Carl O. Sauer.:

Sauer called such field studied which aimed at exposing the areal expression of man's activities. man behaving in accordance with the norms of his culture, perform work on the physical and biotic feature of his natural surroundings and transforms them in to the 'cultural landscape'.

- Physical or natural landscape change in h cultural landscape.

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Neo - Determinism:

- Griffith Taylor

- Taylor a leading Australian geographer. He argued that possibilities had developed their idea in temprate enviorment such as north-west Europe.

But such enviorment are rare in Australia, is much more extreme control over human activity is enormous.

- He in the 1920's argued that 'the limits of agricultural settlment in Australia, factors in the physical enviorment such as rainfall.

Stop - and - go determinism:

'In the short term, people might attempt whatever they wished with regard to their enviorment, But in the long term, nature's plan would be ensure that the enviorment won the battle and forced a comprmise out of its human occupants.'

- Man is able to accelrate, slow or stop the progress of a country's (region's) development. But he should not, if he is wise, depart from direction as indicated by natural enviorment.

for example: man is like a traffic controller in a large city who alters the rate but not the direction of progress.

"Neo-Determinism is also known as 'stop-and-go determinism' and Griffith Taylor philosophy can be very vividly explained by the role of a traffic controller."

'man has advanced one more stage in his adjustment to the limits laid down by nature' - G. Taylor.

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- Reaction of man & land are mutual, this is evidently true is :

Wooldridge

coined - popularise

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⑤ Areal Differentiation :

~~Hettner~~ - Richard Hartshorne.

① 'The study of areal variation of human and physical phenomena as they related to other spatially proximate and causally linked phenomena is known as areal differentiation'.

② 'we may refers to classification and comparision of places as areal differentiation'.

coined - Sayer
popularised - Hartshorne

The term 'areal differentiation' was coined by Sayer in 1925, popularised by Richard Hartshorne in his monumental work 'Nature of Geography' in 1939. 'A perspective

- Richthofen's says - chorological concept in 1883. Nature of Geography
- Alfred Hettner says - 'spatial' or 'areal variation'. (क्षेत्रीय विभिन्नता।)

* General direction of Areal Differentiation :

1) Humanistic Geographer -

Which gives central and active role to human awarness, human consciousness and human activity. Humanistic geographer started emphasing on the social construction of space, the perception of place and the iconography of landscape in geographical descipline.

2) Marxist geographer -

Some of the geographers tried to explain spatial variation in economic activity. The areal differentiation which may have variable influence on the level of quality of life in different region of the world.

3) Contexual geography -

takes in to account the interaction of place and human beings which produces homogeniety & disparity in geographical feature of the world.

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4) Systematic Geographer -

deals with only a particular element in geography for e.g - human settlment, agricultural or industrial development. To analyse spatial pattern of each and every man-made feature by factors which influence its location.

* In the 1980's -

① Humanistic geography, highlighting the social construction of space in the context of human action.

② The analysis of development disparity across the region.

③ The 'intellectual inspiration' came from the increasing role of sociology, in human geography

- Areal Differentiation in India :

Indian geographer 'R.P. Mishra' explaing areal differentiation in the context of developing countries like India.

* Cause of A.D. in India -

(i) the lopsided developmental process.

(ii) dual economies.

(iii) market-oriented economies

(iv) few core areas.

Areal differentiation is the difficulty of neat boundry delimitation betn places and region. It is incapable of contributing towards effective generalization.

'Areal differentiation helped in the reconstruction of regional geography'.

David Harvey : 'Human welfare'
Hettner : 'chorology'

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② Spatial Organization: क्षेत्रीय संगठन

- ~~B. M. Smith~~ David Harvey (19

Friedman (1966):

internal spatial organization

"This system will fulfill essential goals of internal spatial organization such as national integration, effeciency of location, maximum growth potential and a high degree of interregional balance."

Kuklinski -

human activity interrelation

"It is pattern of clusters of human activity interconnected by movments networks resulting from locational and temporal interrelation".

① It attracted attention of geographers during 1970's.
② This concept deals at least four types of theoratical approches such as: (i) descriptive (ii) positive (iii) deterministic (iv) control.
③ It emphasizes on 'functional coherance' as well as on locational manifestation.
④ It deals with the aggregate pattern of the use of space by a society.

- Space consits of layered and collective memory, of residual, dominant and emergent culture, each incarpoting the historical scars of class, ideology and economics.

human activities interacting with each other

"The concept of spatial organisation serves to concentrate attention on the patterns of interrelated locations of human activities interacting with each other, rather than on the problems connected with optimal location".

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for example: cities are the main agents for spatial integration of the social, economic and cultural system of a nation. The interrelation are complex.

Dec-2008

"Spatial organization can be observed when component of an abiotic or biological group are arranged non-randomly in space."

- Ablotic patterns, such as the ripple formations in sand dunes or the oscillating wave patterns of the 'Belousov-Zhabotinsky' reaction emerge after thousands of particles interact millions of times.

Spatial structure: 'arrangment of phenomena ~~means movment~~ over the earth surface".

- Burges view - defined by interpriting structure as geometrical.
- Q.R. in Geography spatial pattern synonimous to spatial structure.
- It's depend on human action.

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QUANTITATVE REVOLUTION

Def^ - - I. Burton

"The application of statistical and mathematical techniques, theorms and proofs in understanding geographical system is known as quantitative revolution".

tech understand geog.

- I. Burton who published a reasearch paper 'The Quantitative Revolution and Theoratical Geography' in the 'Canadian' geographer in (1963)

- The statistical methods are used to estimate, and test the significance of, various parameters associated with a given mathamatical model, such as distance decay & gravity model.

* Development of Quantitative Revolution:

- In 1948 James Conant, 'President of Harvard University' had conclusion that - "geography is not a university subject".
- The Department of Geography of Harvard University closed down after private university in U.S.A.
- The continual threate departmental closes or staff reduction also in America.

- The American universities for new ideas and reasearch programmes.
- This resulted in to the development of 'spatial sciences school', also 'quantitative revolution' in geography.
- Using quantitative technique to generalize and formulate their own theories and models.

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* Objectives :

1. To make precise statment, about locational order.
2. To test hypothesis and formulate models, theories and laws for estimation and prediction.
3. To identify ideal location for economic activities.
4. To use mathematical language of litrature - Af. Am, BW.
5. To make scientific descipline. → Instead of the language of
6. To provide geography a sound philosophical and theoretical base.
7. To interprte geographical phenomena in rational & objective manner.
8. Q.R. revolution influenced geography mainly through of locational Theory.

* Historical Perspective :

Although geographers barrowed several models from economics and sociology.

for example : ① Crop intensity model - Von Thunen (1826).
② Industrial location - ~~Christllar~~ Weber (1909)
③ central place theory - Christllar (1933)
④ crop combination - weaver (1954)

* Merits of Quantitative Method -

① It is based on a empirical observation.
② It support also positivism.
③ statistical technique help in reducing data.
④ These technique help in the estimation, interpolation, simulation of data.
⑤ They also hely in describing, analyzing and simplifying a geographical system.
⑥ The use in the building of theories, general & spatial law.
⑦ Quantitative school encouraged geographers, to become more ~~assinvolved~~ involved in planning.

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* Demerits of Quantitative method :

(i) The man and enviornment relationship can not be properly established.
(ii) Empirical data excluded the normative question like - belief, taboos, emotion, attitude, hopes etc.
(iii) The model and theories developed on the basis of unreliable data and faulty picture of geographical reality.
(iv) making reliable model and universal laws in human geography is all time not possible.
(v) The estimation and prediction data many time a danger of overgeneralization.
(vi) Quantitative technique reduced people to 'passive agent'.

'we understand that the quantitative technique are the 'sharpest tools' of science'. In brief quantitative revolution also could not enable to geographers to formulate universal law and paradigms.'

* It focused on areal differentiation.
* It followed the methodology of spatial science.
* It helped in the development of methods of spatial structure.

* Stages of Quantitative Revolution -

1. I^st stage - (1950-58)
   - Data Generation
2. II^nd stage - (1958-68)
   - Rank size correlation, scatter map, regretion line.
3. III^rd stage (1968-78)
   - Nearest Neighbour, multi variate Analysis)
4. IV^th stage - (1978 - present)
   - Three dimentional models, Digital maps

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* Postmodernism:

"is a movment away from the viewpoint of modernism. More specifically it is a tendency in contemporary culture charactrized by the problem of objective truth & inherent suspicion towards global cultural narrative & megha narrative."

- The postmodernism in geography can be traced in three stages:
  - (i) social science concept of geography.
  - (ii) Transformation of Geography.
  - (iii) spatial science.
- It is focus on the spatiality of social life i.e. spatial dimention of social perception.
- The totalization process will lose the relevence of geography as a whole & therefore post-modernism is anti-totalization in geograp

Net Jour of

* Spatial structure & spatial process -

* Spatial process - means movment over the earth's surface.
* spatial structure - the resulting arragment of phenomena on the earth's surface.
- In Burge's view spatial structure could be defined by interpriting structure as geometrical.
- The central feature of the Q.R. in geography where in spatial structu became synonymous with spatial pattern.
- spatial structure is both a condition & consequence of human actio

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② Spatial Structure, Pattern and Process

* **Introduction -**

Spatial structure, pattern and processes are very closely related to the spatial organization. 'Combination of these three, spatial structure, spatial arrangment or pattern and processes responsible for structure & pattern is known as spatial organization.'

a] **STRUCTURE** - (रचना / संरचना)

internal relative location of different phenomena.

'Internal organization, internal distribution or relative locations of the element of the distribution, the internal relative location of different phenomena of the earth surface is consider together and this is known as spatial structure'. or

How 'the different phenomenan are arranged on earth surface' is called spatial structure.'

* **Relation bet^n structure and process -**

We can give the answers to the spatial quetion What? Where? Why? and How? to understand the relation bet^n structure and process. The process produce the structure. The process known as mechanism.

Causal relat^n.

There is a effect of process on the structure. There is causal relationship bet^n structure and process.

Example - (i) In Kolhapur, the existance structure determine the establishment of new super market.

(ii) Human behaviour process - There is different activities of man spatial structure of road, railway, Industrial spatial structure, commericial market structure.

human behavior responsible different economic structure

- Thus this human behaviour process responsible for different economic structure.

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(iii) The circulation process of newspaper determine the structure of sphere of influence.

structure are dynamic in nature

- On the earth surface different processes and these force different structure with the changes in time, structure is also changes. Structure is dynamic in nature. (Social, cultural, Political & Physical process)

b] Pattern - (प्रारूप / नक्शीदार रचना)

spatial pattern main theme of Geography

In geography, we make the study of spatial pattern is the main theme of Geography. The pattern considred the 'spatial dimentions of spatial phenomena'. The spatial pattern is understand by important tool of geographical map.

* Types of spatial Pattern :-

(i) Continious uniform pattern - 'If the phenomenon are equally located on earth known as continious uniform pattern.' ⟿

process for this

Example - The distribution of relief, distribut^n of temp. etc.

(ii) Discrete Pattern - — — —

'If the distance variation of element discontinious or discrete pattern.'

Example : Distribut^n of popl^n, density, water resources, forest, soil & crop.

- These are some simillarities & dissimilarities.

(iii) Point Pattern - •

Some times pattern of distribution is element on point on the earth.

Example - Location of cities, homes & mines etc.

(iv) Linear Pattern - ——

Some times pattern of distribution is shown by lines on maps.

Example - Road map, distribution of river.

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(v) Area Pattern- ▭

Spatial distribution is shown by using area known as area pattern.

Example - Landuse pattern, different climate distribution.

(vi) Clustred Pattern- ∴

'Some times settlment clustered at one point and relative distance then it is called cluster pattern'.

(vii) Random distribution pattern- ↑ ↑ ↑

If elements are randomly distribute on earth it is called random distribution pattern.

C] PROCESS: (पद्धत) कार्य पद्धती

Process is responsible for structure and pattern. There is close relation betn structure, pattern & process - on the earth. There are different process: e.g.

process responsible for struct & pattern

Example - Physical, Economic, social and cultural.

The result of these process are structure & pattern.

- The terriestrial surface differ from one place to another. This spatial organization related to process require structure and pattern.

Example - what was nature of Geography in 15th century.

In ancient period there are Greek, Roman, Arab geographers are studied geography in discriptive nature. There is the process and cause and effect were not consider or no related to the phenomenas.

But modern geography many approches were develop and the spatial analysis is done with the help of these approches, diffrent process, cause & effect understood in the study of geography.

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- One German geographer followed the Kantian tradition of space - Hettner
- who used the word 'ensemble' - Prestone James.
- which American geographer carried on the Kant - Hettner tradition forword - A. Hartshorne.
- One British geographer carried on the regional geography represented a 'behavioural backlash' - Richrd chorley.
- The concept of 'Regional system' was developed - Phibrick -
- who delinated the 'morphological regions' of the 'U.K' - Dickinson.
- The dichotomy of General Geography and special geography was advocated by - Varenius.

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- The concept of 'climatic energy' propounded by - Huntington
  Davis, Hutington, Ratzel
- Charles Darwin has been called - Edison of Biology.
  edision of biology, Newton of Biology, champion of species
- Voluntarism views man as - a modifying element to some extent.
  a slave to nature, a master of nature, a modifying element to some extent.
- The early geographer belived in the philosophy of - Determinism.
- F = f (mp) t - K.J. Gregory.
- The term 'social Darwinism' was coined by - Spencer.
- who proposed the reduction of geography to social morphology - Emile Durkheim.
- The present role of enviormental and astrological influence on human life was - Jean Bodin.
- 'morphology of Landscape' was written by - Carl O. Sauer.
- who introduced the term 'compage' in Human Geography - whittlesey.
- Brunche's facts of destructive exploitation refers mainly to - mining.
  'robber economy' →
- who wed the word 'Ecology' - Haeckel.
- The concept of ecology was elabrated by - ~~Barrow~~ Tansley.
- The founder of concept Human Ecology - Barrow
  & 'Geography as the study of Human Ecology'.

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June 07

⑦ POSITIVISM

'man is the measure of all things.' — Auguste Comte (1920-30's)

A philosophy of science originally proposed by Auguste Comte in 1820's and 1830's. The primary purpose of positivism was to distinguish science from metaphysics.

'Positivism is also called as empiricism'.

- The positivism advocate with empirical questions, these questions are things are in reality. It is a reality defined as 'speak for themselves', or 'letting data speak themselves'.

- Thus, positivism is a philosophy which is 'anti-idealism'. Positivists further stress that we can not investigate and test moral norms e.g. belief, attitude, tradition etc.

- Positivism states that the scientific statement should be based on empirical & experience data.

* **Element of Positivism :**

(a) Empiricism - (Experience) The modern view of scientific method is that both experance & reason play an important role in science.

(b) Unified scientific method - accepted and routenly drawn upon by the entire scientific community.

(c) formulation of scientific laws - the formal construction of theories capable of empirical verifications, their successful proof would serve to identify universal laws which had.

(d) Exclusion of normative question - like belief, values, customs, attitudes, prejudices ruled out of scientific court because they could not be empirically tested.

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(e) Unification of scientific laws: the progressive unification of scientific laws into a single, incontrovertible system.

* **Historical Perspective of Positivism:**

'The name 'positivism' derives from the emphasis on the positive science that is on tested and systematized exprence rather than on undisciplined speculation'.

- There are verious version of positivism:

(i) British Empiricism -

'John Lokke' and 'David Hume' belived that 'all knowledge is derived from the evidences of the senses'.

(ii) Continental positivism -

August comte (19th century) who emphasized that positivism is not to destroy but to organise. Comte's positivism viewd history as progressing through three stages: ① the religious ② the metaphysical and ③ the scientific.

(iii) Logical Positivism -

It is 20th century positivism. In real terms, modern positivism began in the 1920's establishment, of the so called 'Vienna circle' by 'Moritz Schlick' in association with mathematicians and scientists.

* **Impact of Positivism of Geography:**

(i) Geography as a spatial science - During 1950's the models of spatial structure and spatial analysis widened their scope mainly based on positivism.

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(ii) Encouraged quantitative revolution - in geography during 1960's by the increasing use of mathematical and statistical techniques in geographical studies.

(iii) Provides sound basis for geography - to be an empirical science; Geographers are using the hypothetic - deductive method of positivism. Geographers are more intrested in Enviornmental problems.

(iv) It favours geography to be macrogeography: Its objective is the unity of science, which helps geography to be a coherent science itself.

* Limitations of Positivism:

1) Geographers have to accept uncritically the method of other disciplines.
2) The problem of objectivity and subjectivity is very difficult to resolve.
3) It is a natural and social sciences are cannot be the identical nature from the experimental point of view.
4) Positivists method cannot be applied in 'social sciences'.
5) We cannot consider human behaviour the same way as animal behaviour.
6) Positivist can not investigate and test moral norms for e.g - belief, attitudes, tradition, values, customs, prejudices are ruled out.

- Spatial analysis closely associated with positivism.

'Behaviourism is an approch to human geography and in particular to the process responsible to human spatial behaviour'. ✓ DATE

BEHAVIOURALISM :1960-70'

- W. Kirk

Distatisfaction with the models and theories developed by the positivists, using the statistical techniques with based on the 'economic rationality' of man led to the development of behavioural approch in geography.

• Defination: 'A psychological turn in human geography which emphasized the role of cognitive (subjective) and decision-making variables an mediating the relationship betn enviorment & spatial behaviour'.

* Objectives of Behavioural approch:

1) To develop models for humanity which were alternative to spatial location theories.
2) To define cognitive enviorment which determine the decision-making process of man.
3) To explain the psychological and social theories of human decision-making and behaviour.
4) To search for method other than mathematical & statistical.
5) To explaination of human activity and physical enviorment.
6) To generate primary data of human behaviour.
7) To adopt interdisciplinary approch, for theory building and problem solving.

* Basic philosophy of behaviouralism-

man-enviorment interrelation

'The behaviour geographer recognizes that man shapes as well as responds to his enviorment and that man and enviorment are dynamically interrelated. man is viewed as a motivated social being, whose decisions and actions are mediated by his cognition of the spatial enviorment.'

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* **Salient Features :**

1. The behavioural geographer argued that enviormental cognition upont which people act may well differ markedly from the true nature of real enviorment of the real world.

2. Behavioural geographers give more weight to an individual rather than to groups, or organizations or society.

3. Behavioural approch in geography postulated a mutually interacting relationship bet^n man and his enviorment.

4. Behavioural geography is multi-disciplinary.

* **Historical Perspective :**

- Immanual Kant - adopted by behavioural approch.
- Declus (19th) - emphasized man-enviorment relationship man is a not passive agent.
- Wright (1947) - Interpritation of man-nature interaction.
- Simon (1957) - He saw the man as behaving within the bounds of rationality in complex world.

In Europe the finnish geographer 'Johannes Gabriel Granno, and his Estonian student 'Edgar Kant' were attempting a behavioural approch in 1920's.

* **Fundamental components of Decision Making**

1) A detector - (or sensor) which picks up information signals from the enviorment and feeds it back to.

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2) A Selector - (or governor) which choose what to do about the information on the basis of some predefined goal or objective and then passes instructions to.

3) An effector - which carries out the instructions and performs the chosen act of behaviour.

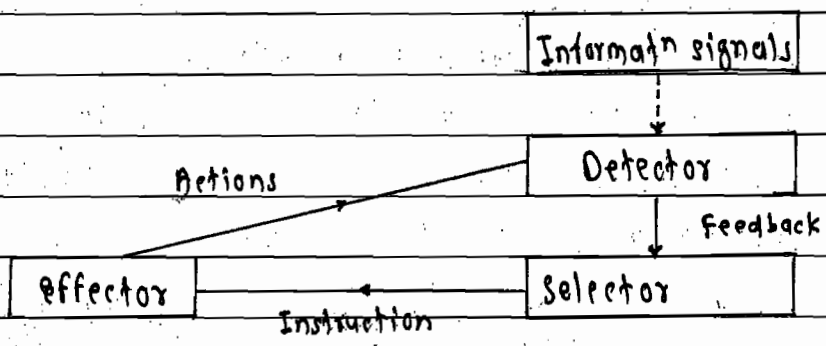


Fig: A simple cybernetic model of decision-making system.

* Criticism of Behaviouralism:

1) One of the main weakness of lack in synthesis of empirical findings, poor communication & conflicting terminology.
2) Same space (enviorment) has different meaning to different individuals.
3) Contextual enviorment i.e. culture, belief, religion & expection is ignored.
4) Behavioural geography has been gap between theory & practice.

'The approch to man-enviorment relationships that many geographers adopted in the late 1960's as a part of the movment towards behaviouralism in geography had many distinguishing features.'
- It started with the premise that enviorment condition upon which people act may differ markedly from the true nature of the real world.

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RADICALISM

- R.J. Peet (1977)

The radical approch in geography developed in 1970's as a reaction to 'quantidative revolution' and 'positivism'.

- The radicalists stressed on three political issues: ① the Vietnam ② civil right of American black ③ the pervasive poverty and inequality suffered by resident of urban 'ghettos'.
- This approch was close to 'marxism' and 'Antipode' was their journe
- 'socio-economic inequalities of man' is the subject matter of radicalism.

* Origin of Radicalism:

- The issues of great social relevance like - inequality, racism, sexism, crime, delinquency, discrimination agains blacks and non-whites, females and enviormental resources.
- The origin of the radical geography movment can be traced to the in the late 1960's, especially in the U.S.A. with three political issues:
  ① The Vietnam war.
  ② Civil Rights (especially American blacks)
  ③ the pervasive poverty and inequallity suffered by the residents of urban 'ghettos'.
- It was radicalized students and junior faculty members started publishing articles with ~~with~~ more 'socially relevant'. ~~and~~
- professional journals - 'Antipode' - a Radical journal of geography in 1969.

* Peet (1977): Radical geography developed largely as a negative reaction to the established discipline. The radical geography introduced to the study of topics such as, poverty, hunger, health, and crime to human geographers.

- ~~Ra~~ eography has four view: ① History of ideas PAGE
  ② Philosphy of science ③ Development of theory ④ The view of practi

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* Objectives of Radical Geography:

1) To highlight the weakness of the positivism and quantitative revolution.
2) To remove regional inequalities.
3) Radicalists apposed political centralization and economic concentration.
4) They were against imperialism, nationalism and racism.
5) They opposed the idea of the superiority of the white and the west.
6) The Radicalists as a man & enviorment relationship may be understood through history.
7) To develop a more just, equal, tension free, peaceful and enjoyable society.
8) It is a holastic view of economy, society and polity.

* Work of Radical Geographers:

1. Geography and Imperialism:

'An unequal territorial relationship, usually betn states, based on domination and subordination is known as imeppialism'.

unequal territory relationship

-Imgerialism has been considered largely responcible for destructive economy - 'robber economy' or violent attack on nature, which cause poverty in the 3rd world countries.

11. Women and Enviorment:

The women's movment of 1960 inspired the radical geographers to explore and make in-depth study of the man and enviorment.

role of female in decision making process.

- The female geographers raised the question of women and enviorment, and the role of females in the decision-making process about the utilization of natural processes.

particular to general - inductive approch.
General to particular - Deductive approch.

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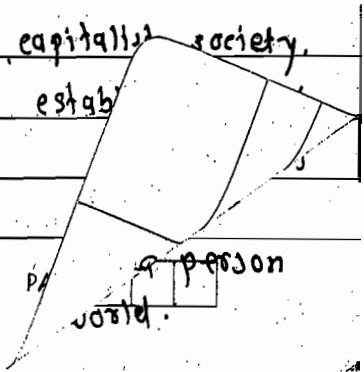
iii. Anarching Learning : (अराजकतावाद)

'Removal of the state and its replacment by voluntry groups of individuals who can sustain social order without any external authority is known as anarcism'.

* Criticism of Radicalism :

1) The theoratical base of the radical paradigm was weak.
2) Radical geography was radical in topics and politics but not in theory or method of analysis.
3) The radicalist could not develop an appropriate model about population resources.
4) The radical geographers gave over weightage to marxism.
5) The radicalists and marxists gave priority to time over space.
6) It is all against the capitalism.

- Raddicallism in geography came in the form of a reaction geography as a 'spatial science'.
- The origin of radical approch can be traced to civil right, poverty and in equality.
- The founder of radicalism in geography had a strong marxist base.
- some of the radical geographers termed radicallism as 'the political - economy perspective'.
- The premise that progress is independent of the material conditions.
- Radicalism aimed at a general restructuring of capitalist society.
- Radical geographers have made great inroads to estab the discipline of the geography.



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HUMANISM

-Yi-Fu-Tuan (1976).

- Humanistic geography developed due to a deep satisfaction the mechanical models in quantitative revolution.
- The first geographer to attract humanistic approch was 'Kirk' (1951), But it was Tuan (1976) who argued for humanistic geography.
- The term 'humanistic geography' was used for first time by Yi-fu-Tuan in 1976.

coined - Kirk (1951)
applied - Tuan (1976)

• Defination: "An approch to human geography distinguished by the central and active role that it gives to human awarness and human agency concicousness and human creativity. It is 'an expansive view of what the human person is and can do'" - Tuan

- Humanism in geography developed as a criticism against positivism and quantitative revolution in geography.
- Humanists explain man and space relationship.
- Geography as 'the study of the earth as the home of man'.
- Humanistic geography achieves an understanding of the human worlds by studying people's relation with natur.
- Place is a key concept of humanistic geography.

* The Methodology of humanists is charactrised with:

1) A self-conscious drive to connect with that special body of human expreence & human expresion.

a) Its methods are essentially those of literary criticism, aesthetics and/art history.

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- Humanistic geography attempts at understanding meaning and values of life events.
- Humanism gives the central and active role to human awarness.

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3) It's interest is the recovery of place and the iconography of landscap

4) It lays emphasis on participant observation, interaviewing, focus group discusion rather than statistical and quantitative tenchniqu for establishing correlation betn people & place.

5) Humanists argues that 'objectification' is never simple excercise which convectional forms of science assume them to be.

* Themes in Humanistic Geography:

Humanistic geography does not consider human being as an 'economic man'. The propoun of humanistic geography 'Tuan' explored five themes; of general interest to geographers namely:

1. Geographical Knowldge -

The primary task of humanistic geographers therefore, is the study of geographical knowldge. It is knowldge of geography is necessary to biological survival.

- All animals must have it, and even the migratory birds hav a mental map. e.g: Saiberian birds migrate to Bharatpur.

2. Territory and place -

Teritory and place is also an important animal instinct. Some species of animals, like honeybee, tiger, lion etc. defend their living space against intrudes.

- much more than animals, man developes emotional attachment to place as he satisfies his biological needs e.g - drink, eat. etc

3. Crowding and Privacy -

Crowding of a place leads to physical and psychological stress. The behaviour of man at a crowded place becomes abnormal. Culture, social, institutions and infrastructures help in reducing stresses.

- Privacy affect the thinking process & decision making of a person regarding space. In solitude person creates his own world.

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- development and quality of life.

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4. Livelihood and Economics :

Man sustain himself by doing some economic and social activities. While working for his livelihood, man differentiates between life sustaining and life-destroying activities.

5. Religion :

Religion is present at varying degree in all cultures. It appears to be universal trait. In religion human beings are clearly distinguished from other animals.

* Historical Perspective :

- Kantinian philosophy : Geography that of 'space', History as 'time'.
- Blache : school of possibilism, 'nature is never more than adviser'.
- Hartshorne (1939) - pleaded the cause of humanistic geography in his book 'The nature of Geography'.
- Kirk (1951) and Tuan (1976) - strong foundation of humanism in geography.

* Criticism of Humanism :

1) Humanistic geography never providing true explaination.
2) It is methodological ground is seperates physical geography from human geography.
3) In humanistic geography difficult to develop theory.
4) It is insignificant emphasis on applied reasearch.
5) Humanistic geography does not offer a viable alternative to nor a pre-suppositionless basis for, scientific geography.
6) Humanistic approch is 'methodologically obscure'.

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- **Pragmatism: ('Peirce')**

'is the position in philosophy that defines meaning and knowledge in terms of their function and expirence, with reference to adjustment and the resolution of problamatic situation.'

- A philosophical perspective, which is centrally concerned with the construction of meaning through the activity of human being.

Idealism, realism, nominalism.

- **Probabilism: (Spate, O.H.K., 1957)**

'The view that although the physical environment does not uniquely determine human actions, it does nevertheless make some response more likely than others'.

- 'The easiest of the possibilities is the most probable'.

Pragmatic possibilism: Thatum / Tatham.

- Humanistic geography depended on the ~~greed~~ growing need of social relevence of the subject.
- Humanistic geography drew much from the radical trend in geography

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June 05

	Humanism	Radicalism
1)	The central and active role of humans in terms of human awarness, human agency, human consciousness & human creativity.	- It is emerged during 1970's & 1980's as the inadequancies of behaviouralist method became clear.
2)	- This approch on the self of human being from description of pattern of human phenomena	-- It sought to counter the 'positivist' Quantitative methods with normative techniques drawn from marxist theory.
3)	- In the process human geography has become more humane.	-- It argued, were not useful unless alternatives or solutions were given to problems.
4)	हा लोकांचा अभ्यास आहे. जो स्वतः लोकांचे व लोकसंख्या आहे.	- हे प्रस्थापित व प्रयोगावर अवलंबून आहे.
5)	यात्रा मुद्दा मानवाचे जगणे, कृती करणे व विचार करणे हे समजून घेणे होय.	- हा मार्क्सवादातून जगातील मानवसमूहांची 'आहे रे' व 'नाही रे' अशी विभागणी करतो
6)	हा दृष्टिकोन मानवी भूगोलातील आहे.	- हा दृष्टिकोन सैद्धांतिक व प्रात्यक्षिक भूगोलामधील क्रांतिचा आहे.

* कल्याणकारी भूगोल (Welfaire Geography) - ① "मानवी भूगोलातील दृष्टिकोन, जो सामाजिक विषमतेशी संबंधित आहे व ज्यात क्षेत्रीय भिन्नता & मानवी क्रियांचे कल्याणाच्या दृष्टीने आंतरक्षेत्रीय संबंधाचे अध्ययन होते, त्याला 'कल्याणकारी भूगोल' म्हणतात." - Clerk.

② 'सामाजिक विषमतेशी निगडीत क्षेत्रीय भिन्नता & मानवी क्रियांचे कल्याणकारी दृष्टीने केलेले अध्ययन म्हणे कल्याणकारी भूगोल होय.'

classmate

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* वर्तनात्मक भूगोल (Behavioural Geography) -

- १९६०-७० च्या अखेरीस व ७० च्या प्रारंभीस अशी कल्पना पुढे आली की भूगोल मानवाच्या वर्तनाशी संबंधित क्रियेशी निगडीत आहे.
- 1960 मध्ये 'साचमन' यांनी वर्तनात्मक भूगोलाचा विकास केला.
- त्याआधी युरोपमध्ये जोहान्स, ग्रॅबिएल ग्रॅनो व एडगार कान्ट हे वर्तनात्मक दृष्टिकोनाविषयी प्रयोग करत होते.
- व्याख्या : ① "मानवाच्या कृतीचे व्यापक विश्लेषण, त्याच्या परिणामांतून घडणाऱ्या घटना यांचे केलेले प्रत्यक्ष किंवा अप्रत्यक्ष निरीक्षण व त्याचा मानसशास्त्रीय व कृतिशील परामर्श म्हणजे 'वर्तनात्मक भूगोल' होय."
  ② वर्तनात्मक भूगोल हे भूगोलाचे क्षेत्रात्मक क्षेत्र आहे - Gold

* घटक :

① शोधक (Detector) - पर्यावरणापासून माहितीचे संकेत मिळवून तिचा पुरवठा करणारा.
② निवडक (selector) - मिळविलेल्या माहितीतून निवडक सूचना पाठविणारा.
③ परिणामकारक (effector) - सूचनानुसार वर्तनात्मक कृती करणारा.

* वर्तनावर परिणाम करणारे भौगोलिक घटक -

1. सूचना - पर्वतीय क्षेत्रातील लोकांचे वर्तन कष्टाळू व निश्चिंतपणे असते तर मैदानी प्रदेशातील लोकांचे वर्तन साधे व सरळ असते.
2. ज्ञानमान - शहरी व समशीतोष्ण कटिबंधातील विचारपूर्वक व शांत तर उष्णकटिबंधातील उतावळे व भावनाप्रधान असतात.
3. इतर घटकांत जिज्ञासा, सामाजिक व आर्थिक दर्जा, व्यक्तिगत रुची, वय, अनुभव, शिक्षण व आशा-आकांक्षा हे घटकही महत्त्वाचे आहेत.

* वर्तनात्मक दृष्टिकोन (Behavioural Approach) -

- या दृष्टिकोनात मानवी वर्तनावर भर दिलेला आहे.
- Gold या तज्ज्ञाच्या मतानुसार वर्तनात्मक दृष्टीकोन ५ मुद्द्यावर आहे -
  ① निसर्ग, पर्यावरण व व्यक्ती यांचे भिन्न स्वरूप.
  ② व्यक्तीने पर्यावरणात बदल करण्यासाठी केलेल्या क्रिया.
  ③ वर्तनात्मक दृष्टीकोनाच्या अभ्यासाचे व्यक्तिगत स्वरूप.
  ④ वर्तनात्मक भूगोलातील वस्तुनिष्ठता.

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Heliocentric: Copernicus (1543) -

'The old time concept of the earth as the centre of the universe was abondended in favour of the concept of a heliocentric universe first put forward by the Polish scholar Nicolous Copernicus in 1543.

Teleology - Ritter

'The theory that events can only be explained as stages in a movment towards a pre-ordained end is known as teleology'.

* महत्व (Importance) Industrial Geography

1. वर्तनात्मक भूगोलाचा अवलंब सर्वप्रथम औद्योगिक भूगोलात करण्यात आला. या दृष्टीकोनात संख्या (quantity) व गुणवत्ता (quality) ही दोन महत्वाची वैशिष्टे सांगितली

2. वर्तनात्मक दृष्टीकोन हा केवळ नैसर्गिक व पर्यावरण घटकांना महत्व देत नसून मानवी वर्तनाच्या क्रियेला महत्व देतो.

उदा. प्रश्नादरम्यान विकासाठी उद्योगाचे स्थानिकीकरण होण्यास नैसर्गिक घटकच कारणीभूत असतात असे नसून उद्योगपतीच्या निर्णयालाही महत्व आहे.

3. वर्तनात्मक दृष्टीकोनाचे अनुयायी सांख्यिकीय समस्येचे स्पष्टीकरण मानवी व प्राकृतिक दृष्टिकोनातून करतात. भूगोलामध्ये हा दृष्टीकोन विकसित झाल्याने 'वर्तनात्मक क्रांती' (Behavioural Revolution) म्हणतात.

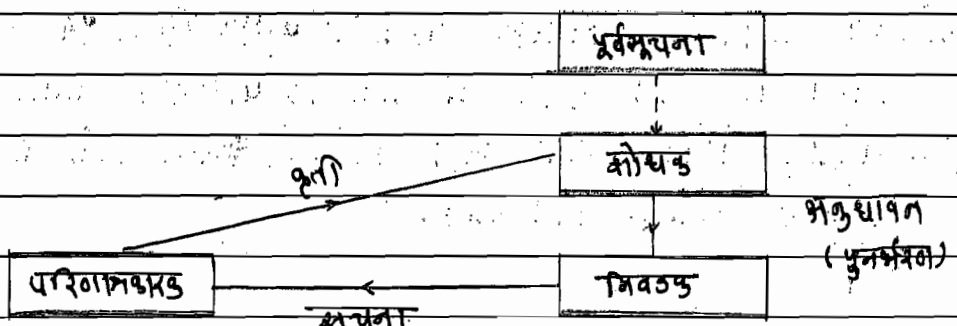


fig: निर्णयप्रक्रिया

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मानवतावादी भूगोल (Humanistic Geography) -

- ह्युकने प्रथम 1950 मध्ये संकल्पना मांडली नंतर Yi-fu Tuan समर्थन केले. 1970च्या दरम्यान Humanism चे भूगोलात आगमन झाले.

• अर्थ: 'मानव काय आहे? व तो काय करू शकतो याविषयीचा दृष्टीकोन व्यक्त करणारे शास्त्र म्हणजे मानवतावादी भूगोल होय'. -Tuan.

- समाजाच्या मूलतत्त्वांचा अभ्यास हा सामाजिक व प्राकृतिक विज्ञानांपेक्षा मानववंश व मानवी स्वभावावर आधारित आहे.
- मानवतावादी भूगोलात मानवी जाणीव, मानवी प्रतिनिधित्व, मानवी सदसद्विवेकबुद्धी व मानवी उत्पादनशीलता यांचा अभ्यास होतो.
- हा विचार प्रत्यक्षवाद (Positivism) व भूगोलातील बदल यांच्यावरील टीकेमधून उदयास आला.

* तत्त्वे: (i) मानवाच्या अनुभवासंबंधी विशेष ज्ञानाचा अभ्यास करणे.
(ii) वाड्:मयीन टीका, निसर्गसौंदर्य व ऐतिहासिक कृती यांचा विचार करणे.
(iii) अदृश्याचे प्रतिकात्मक अर्थाचे माध्यम म्हणून विश्लेषण करणे.
(iv) निरीक्षण, विचारविनिमय व तार्किक सारांश यांवरून केलेले विश्लेषण हे संख्यात्मक माहितीपेक्षा महत्त्वपूर्ण असे मूलभूत घटक.

* विषय:

(1) भौगोलिक ज्ञान - पर्यटनाच्या अस्तित्वासाठी भूगोल ही मूलभूत गरज आहे. कारण स्वच्छता, स्थळ व साधनसंपत्तीचा मानसिक पडताळा नाही.

(2) प्रदेश व स्थळ - प्राचीनकाळी मानवाला स्थळ व प्रदेशाचे ज्ञान आहे. उदा: शिकारीचा व आक्रमण रोखण करणारे स्थळ, प्रदेश निवडा.

(3) गर्दी व एकांतवास - गर्दीची ठिकाणे नेहमी मानसिक ताण निर्माण करतात. मानवाला त्याचे स्वतःचे जग निर्माण करण्यास एकांतवासाची गरज आहे.

(4) उपजिविकेचे साधन व अर्थशास्त्र - मानवाच्या बहुतेक क्रिया हया क्रियात्मक स्वरूपाच्या असतात, कारण त्या सामाजिक पद्धतीला आधार देतात.

(5) धर्म - धर्म ही वैश्विक संस्था असून समाजाची धारणा करतो तो धर्म, या संकल्पनेतून धर्माचा उदय झाला.

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मूलगामी भूगोल (Radical Geography) -

• पार्श्वभूमी -

- 'कार्ल सिऱ्हप्रोजेल' या तज्ञाने 1920 मध्ये 'पुरोगामी भूगोल' असे विधान केले.
- मूलगामीवाद हा अराजकता & साकर्ष परंपरेचे मूळ आहे.
- 'मानवी विकास हा मुद्दयावर नव्हून सहकार्यावर अवलंबून असतो.' - Reclus.
- Harve - Positivism जगा समजून घेण्याचा तर Radicalism हे त्यात बदल करण्याचा शोध घेतो.

Radical Approch मांडणाऱ्यांची विरोधी भूमिका होती.

• उगम -

- Radicalism ही संकल्पना Q.R., Positivism व Traditional Regional Geography यांच्या भूगोलविषयनातून विकसीत झाली.
- Radical Geography चा उदय हा 1960 मध्ये U.S.A. मधील पुरोगामी शासकांनी झालेल्या मूलगामी चळवळीतून झाली.

• मुख्य & महत्वाचे मुद्दे:

1. U.S.A. ची व्हिएतनाममधील घुसखोरी.
2. निग्रो लोकांची न्यायासाठी चळवळ.
3. शहरात वर्णभेदामुळे जागेमुळे पडलेल्या लोकांचे वाढते दारिद्र्य.

- वरील गोष्टीमुळे तणाव निर्माण झाला होता.

"विशेषत: मुद्दयांच्या विरुद्ध चळवळ हे मूलगामीवादाचे मुख्य कारण होते."

• साकर्ष - (i) समाज व निसर्ग यांचे परस्परसंबंध समजून निर्माण होतात.
(ii) कुलजना जीवन ठरवीत नाहीत, तर जीवन कुलजना ठरविते.
(iii) राज्य हे लोकांचे शोषण करण्याचे साधन आहे.

* Radical Approch :

(i) समाज हा एकात्मतेने विकसीत होतो व तो तंत्रज्ञानावर अवलंबून असतो.
(ii) समाजाची तात्त्विक भूमिका व राजकीय योजना यात बदल केले पाहिजेत.
(iii) मूलगामी भूगोल हा मुख्यत: सामाजिक कुलजना, असमानता दूर करणे, तदनुषंगिक प्रादेशिक विभाग व विषमतेकडे नेणाऱ्या प्रक्रियेचा & पर्यावरण टिकविणे यांवर भर देतो.

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The debate of radical geography aimed at one of the follwing- Introducing radical changes in the content of geography.

The book entitled 'social justice and the city' deals with one of the follwing- Radical.

Gabrial Grano, Edgar Kant, Pread and walport were related with- Behavioural geography.

Social Darwinism' was elaborated by - Herbert Spencer.

N.M. fennerman prepared a model 'Circumferance of Geography' in 1919 to solve the dispute of subject.

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1) River: anicent name — Present name

i. Kshubudi - Sutlej
ii. Parushni / Iravati - Ravi
iii. Asikini - Chenab
iv. Vitasta - Jhelum
v. Kubha - Kabul
vi. Mahagauri - Damodar

2) Mountains: anicent name — Present name

i. Krishnagiri - Karakoram
ii. Anjana - Sulaiman
iii. Menkagiri - Siwalik
iv. Arbud - Aravali

3)

Age	Period
i. Greek age	
ii. Roman age	
iii. Dark age	300 AD to 1200 AD
iv. Discoveries age	1200 AD to 1700 AD
v. Arab age	
vi. Modern Geographical Thought.	

4)

Geographer	Book
i. Pomponius mela	De chorographia
ii. Richard Hokluyt	Principle navigations.
iii. Giles Fletcher	Description of soviet union.
iv. carpenter	World Geography.

5)

Author	Book
i. Geography or Geographers	A.J. Johnstom
ii. The chaniging nature of Geog	Minshull R.
iii. Conceptual revolutn in Geog.	Davis W.K.
iv. Themes in Geographic Thought	Harvey M.E.

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Cultural Hearth - Carl Sauer

Structuralism - Lov Strang

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- आधुनिक भूगोलाचा पाया - हुम्बोल्ट व रिट्टर यांनी घातला.
- भूवर्णनात्मक भूगोलाचे जनक 'स्ट्रॅबो व इरॅटोस्थेनिस' होते.
- 'भूगोल हे वितरणाचे शास्त्र आहे' - हुम्बोल्ट व रिट्टर
- 'भूगोलाच्या अभ्यासात मानव हा केंद्रबिंदू आहे' - रॅटझेल.
- रॅटझेल यांचा 'अँन्थ्रोपोजिऑग्राफी' हा ग्रंथ म्हणजे मानवी भूगोलास मिळालेली एक फार मोठी देणगी आहे.
- 'नगरांचा भूगोल' - अल्बर्ट डाकूचिन.
- क्षेत्रीय विभिन्नता (Areal Differenciation) - अल्फ्रेड हेटनर
- ब्रह्मांड उत्पत्ती सिद्धांत (cosmology) आणि पृथ्वीच्या जीवोत्पत्ती सिद्धांत - ॲनॅक्झीमेंडर यांनी मांडला.
- प्लेटो - हा पहिला तत्वज्ञानी की, ज्याने पृथ्वीच्या गोलाकाराची संकल्पना मांडली. 'पृथ्वी विश्वाच्या मध्यभागी असून सर्व खगोलीय त्या समोवती फिरतात'.
- कॅप्टन कूक यांनी अंटार्क्टिका खंडाचा शोध लावला.
- 'पृथ्वी हे मानवाचे घर' - हंटिंग्टन

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Hecateus ~~Eratothenis~~ : 'Ges-periodus' - Discription of Earth.

Eratothenis : 'Geographia' - father of Geography'

Anaximendar : I^st world map

Dr. Nande

DATE

POSTMODERNISM :

Post modernism is a recent movment in humanities, philosophy, arts and social sciences. It develope in reaction to historicism in modern geographic thought. Postmodernity is everywhere, from literature, design, art, architecture, philosophy, mass media, clothing style, music and television. "Postmodernism raises urgent queti about places, space and landscape in the production of social life."

- Defination: "It is a movment away from the viewpoint of modernism. more specifically it is tendency in contemporary culture characterised by the problem of objective truth & inherent suspicion towards global cultural narrative and megha narrative".

- Charactaristics of Postmodernism:

(I) It is focus on the spatiality of social life i.e. spatial dimention and social perception.

(II) Postmodernism as a shorthand for a hetrogeneous movment which has its origin in architecture and literary theory.

(III) Postmodernism has a wide range of explict and implict meaning and its core is hard to identify.

(IV) Postmodernism in geography stresses on openness in social and geographical enquiry, and artist exprimentation and political empowerment.

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(v) The totalization process will be lose the relevence of geography as a whole and therefore post-modernism is antitotalization in geography.

(vi) The Postmodernism in geography can be traced in three stages : (1). social science concept of geography
(2) Transformation of geography.
(3) spatial science.

Components of Postmodernism -

Dear (1986) usefully classified postmodernism in to three components :

a) Postmodernism as a style -

Postmodernism as a style originated in litrature and literary criticism, and spread to other artistic field such as design, film, art, photography & architecture. The general trend involved the promotion of difference and the lack of conformity to over-riding structural imperatives.

b) Postmodernism as a method -

Postmodernism as method is, according to Dear, likely to be most enduring of the three main trends.

(i) The notions of universal truths.
(ii) meta-theories - 'the meaning of everything'.
(iii) Dominance over another, seprate theories are incommensurable and so cannot be evaluted.

c) Postmodernism as Epoch :

Postmodernism may be thought of as an epoch, a historic era in which changes in culture and philosophy

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are themselves located in the evolution of a global economy and geopolitics.

Postmodernism as epoch portrays current developments within society as a major radical break with the past - hence use of the term 'postmodernity' to contrast it with the modernity of the previous epoch.

- Importance of Postmodernism:

1. It is hetrogeneity, particularity and uniquness undobtedly attracted some human geographers.

2. Postmodernism expressed as 'the great lesson of the 20th century is that all the great truths are false'.

3. Postmodernism is, in a very real sense, 'post - paradigm' i.e. postmodern writers are immensly complete & comprehensive.

4. The paradigm like enviormental determinism, possibilism, positivism, behaviouralism, humanism, structuralism & system approch have been rejected by those belived in postmodernism.

5. Postmodernism presents a substantial critique to the approches which dominated geography betn 1950's & 1980's.

6. They opposed the idea of structuralism and it is largely through this opposition that postmodernism is some times called as 'post - structuralism'.

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⑧ Models in Geographic Research

law-theories-model.

* **Introduction :**

In the post-second world war period, defination of geography, geographic thought and geographic methodolo have undergone great transformation. Geographers have increasingly concentrated in the last few decades on the theme of geographic generalization, formulation of models, theories and general laws. The geographic generalization is also known as 'model building'.

* **Defination :**

(i) Skilling : "A model is either a theory, a law, a hypothesis or a structured idea. It can be a role, a relation or equation".

(ii) Ackoff : "a model may be regarded as the formal presentation of a theory or law using the tools of logic, set theory and mathematics".

(iii) Haines Young and Petch : "any device and mechanism which generates a prediction is a model".

(iv) "Model means exprimentation and observations, is simply an activity which enables theories to be tested and examine critically".

* **Significance of Model :**

1. The subject matter of geography i.e. the complex relationsh of man and enviorment can be examined and studied scientifically with the help of model & theories.

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2. Aim of models is to simplify a complex situation and thus render it more amenable to investigations.

3. In fact, models are tools which allows theories to be tested. A more restractive view of models is that they are predictive device.

4. The geographical reality of the earth's surface and man-enviorment relationship are quite complex, models solve these problem.

5. Models show some features of the real world in a more familiar, simplified, observable, accessible, easily formulated, and conclusion can be drawn.

6. Models provide a framework wherein information may be defined, collected and arranged.

7. Models help to squeezing infomation, explain perticular phenomena, and compaire data.

8. Models form stepping-stones to the building of theories and laws.

* Need of Modelling in Geography :

1) A model-based quantification or formation of unobserved or unobservable phenomena.
Example - The forecast of weather, change of climate, change in sea level, pollution, soil erosion etc.

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2) Models help in estimations, forecasts, simulations, interpolation and generation of data.
Example: The future growth & density of popln, use of land, migration pattern, industralizatn, urbanizatn etc.

3) A model helps in describing, analyzing and simplifying a geographical system.
Example: Location theories of industries, agricultural zone, stages of landform development etc.

4) Modelling is undertaken for structuring, exploring, organizing and analysing the obtained enormous (complex) geographical data.

5) Models helps in improving the understanding of causal mechanism, relationship betn micro and macro properties of a system and enviornment.

6) Modelling provides linguistic economy to geographers and social scientists who understand their language.

7) Models help in the building of theories, general and special laws.

* Types of Models:

a) Descriptive Model - 'is concerned with some static description of reality.'
- Descriptive models may be concerned with the organizatn of empirical information, and termed as data, classificatory (taxonomic) or expiimental design models.

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b) Normative models: 'deals with what might be expected to occure under certain stated or assumed conditions'.

- Normative models involve the use of a more familiar situation as a model for a less familiar one, either in a 'time' (historical) or a 'spatial' (geographical) sense - and have a strongly predictive connotation.

c) Physical or Exprimental models -

'It is may be iconic (idol-shaped) in which the relevant properties of the real world are presented with the same properties with only a change in scale.

Example: maps, globes and geological models.

d) Analogue simulation models -

It is having real world properties represented by different properties. Analogue models are concerned with symbolic assertion of a verbal or mathematical kind in logical terms.

* Classification of Models:

A large number of models have been designed, adopted and applied by geographers. A more simple classification of models illustrated with examples has been given has follows:

a) Scale Models -

'Scale models, also called 'hardware models', are perhaps the easiest type to appreciate as they are direct reproductions, usually on a smaller scale of reality'.

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- Scale models are often used by physical geographers and especially by geomorphologists.

Example: To observe river action, glacier movment, wind erosion, marine process & erosion by groundwa

II) Maps Models :-

Maps are the models that are most familiar to geographers. They are a special types of scale model which become increasingly abstract as the scale become smaller.

Examples: Air - photographs, Diagramatic map etc.

III) Simulation and Stochastic Models :

'Simulation means; imitating the behaviour of some situation or process by means of a suitably analogous situation or apparatus, especially for the purpose of study or personal training.'

Example - predict future development of the spit.

'Stochastic means: randomly determined or that which follows some random probability distribution or pattern, so that its behaviour may be analyzed statistically but not predicted precisely.'

Example: In the field of human geography, to study spatial diffusion of population diseases e.g. malaria, AIDS etc.

IV) Mathematical Models -

mathematical models are considred to be more reliable but difficult to construct - They obscure many of the human values, normative quetions and attitude.

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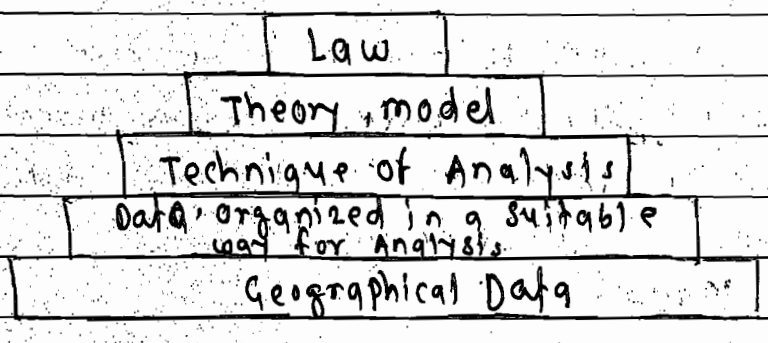
Yet, they have symbolic assertions of a verbal or mathematical kind in logical terms.
Example : Economic Geography - central place theory,
Settlment Geography - Rank size rule.

V) Analogue Models :

'In the analogue models, insted of using limitatn, of the original or symbols to represent it, the feature being studied is compared with some completely different feature by means of analogy'.
- Its value depends on the researcher's ability to ~~regon~~ recognize the element common to two situations.
Example : 'Normal cycle of erosion' - W.M. Davis
'State as a living organism' - Ratzel.

VI) Theoretical Models :

'The conceptual models provide a theoratical view of a particular problem allowing deductions from the theory to be matched against the real situation. Theoratical model is associated with the word 'theory', when this is used to denote the overall framework of a whole discipline.'



- For understanding & explaining complex geographical phenomena, models are of great importance.

DATE

⑧ Geography as a Scientific Discipline

* **Introduction** -

The early part of the 19th century German schollars Humboldt and Ritter led the 'foundation of the modern geography' but it is not a scientific discipline. Scientific geography started from middle of 20th century. The study of geography as a science or as a scientific discipline. It is regarded as a 'pure or natural science' after the world war II, basically period from 1950 to onwords. It is a contemprary period of geography according to 'James Priston'. In this period study of geography was started from scientific point of view and so today geography is called as a 'spatial science'.

* **Scientific Definations of Geography** -

① Schaefer (1953) - "Geography has to be considred as science, related with the formulations of laws which determine the spatial distribution of the features on the earth surface".

② Peet (1977) - "He defined as a scientific discipline and it is consider the process of earth surface. These process are determine the spatial distribution. Thus the geography called scientific disciplne."

③ Yeateo (1968) - "Geography can be regarded as a science because it is related with the rational development laws and theories which explained and predict the classmate spatial distribution on the earth surface.

DATE

a) **Foundation of Scientific Geography -**

German scholars, Humboldt and Ritter led the foundation of 'modern geography' in early 19th century. But Immanual Kant give scientific foundation of modern geography. He divided geography in to two different branches: (i) Physical and (ii) Human and also it is subdivided in commercial, Political, Economic Geography in 19th century.

Thus the Varinious and Immanual Kant the great German geographers led the foundation of scientific geography in 15th & 16th century.

b) **Geography as a European Science -**

There are different exploration activities are condected in continent of Europe and also different voyages (समुद्री यात्रा) were conducted in Europe. Thus the new information about different part of the world are collected in Europe exploration.

- Vasco-de-gama ; reach the continent of Asia & the western coast of India during the 15th century.
- Colombus ; also discovered a new land America in 15th & 16th century.
- Marketor ; The evalution of cartography is also took place constructing a projection for drawing the map of world.
- Then Gallilieo, Kopernikas, Newton this scientist discovered many things, such as binacular, gravitational law etc. during the 15th & 16th century.

There fore this period is turning point for development of geography in Europe. The first university department of Geography in Europe established in 1874.

DATE

c) Geography as a Social and Natural Science -

Geography mostly study the physical or natural aspects exists on the earth surface, deep study of these physical and natural aspects conduct by geography. But there are also many human activities present as the earth surface. These human activities are also studied in the geography.

physical-natur & Human-social aspects.

Thus many physical and human aspects are studied in geography. The physical aspects are studied in natural science and 'human aspects' are studied in behaviour or social science.

- Thus there is confusion in the study of geography, because physical aspects as well as many activities of man are studied in geography.

Therefore it is divided in two branches for avoi the confusion: (i) Physical Geography (Natural & physical aspect
(ii) Human Geography (Social & behavioural scie

d) Geography as a Observational Science -

careful observati data (informati collected.

Many laws, theories and models are used to give explanation of human aspects, on the earth surfa in Geography. So it is called a 'pure' and 'applied science'. It is also a observational science because careful observation of field is made and relevent data & information collecte through field work.

Thus data was analysed by using many scientif methods, therefore geography called as observational science.

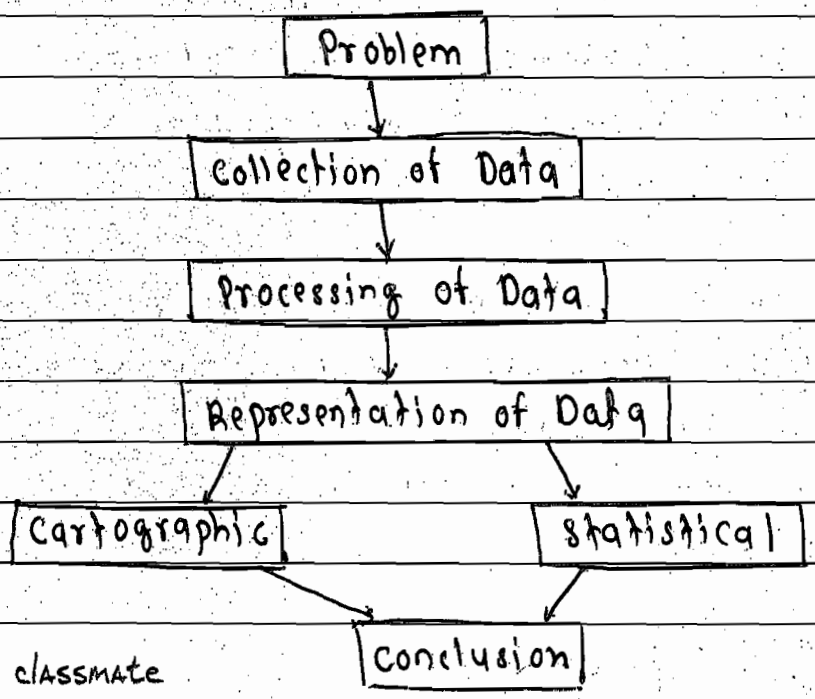
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e) Geography and scientific Method:

When the study of geography as a spatial science, many scientific methods are used. Which is important features of sciences many laws, theories, models, equations, all quantitative and statistical methods are used for making the geographical inquiry.

- The major 3'w' (what, where, who) questions given answred by using many scientific method.
- There are many geographical problems solved by using the scientific methods.
- To give the explanations of geographical problems the field observations is made for data collection.
- The analysis of these data by using many statistical and mathematical techniques.
- The processed data is represented by cartographic representation and statistical representation.
- After this we draw the conclusion to give answer the problem.

This procedure is called as 'scientific method'



DATE

f) Quantitative Revolution in Geography :

- The uses of quantitative methods in geography was firstly started in America in the middle of 20th century, and latter it spread out in Europe & rest of the world.
- Quantitative and statistical techniques are changed the nature of geography from qualitative to quantitative.
- The geometrical relationship bet" different phenomena are analysed in geography with the help of quantitative and statistical method.

g) Geography as a problem solving discipline :

These are many sciences such as physical, social, pure, Applied sciences used some philosophy and principles as a tool in problem solving discipline.

- Geography also have a certain discipline for problem solving method:
  i) Identification of problem.
  ii) Formulation of Hypothesis
  iii) Determined type of data collected.
  iv) Data analysis.
  v) Testing & modification of hypothesis.
  vi) synthesis / conclusion / Generalization.
- This steps are very usefull in problem solving method.

* Conclusion -

Geography is a observational science as well as a natural science and social science. It deals with the scientific methods and quantitative techniques used in study of geography. Geography is also study as a problem solving discipline. In this way we justified geography as a scientific discipline.

DATE

(10) Explainations in Geography :

- **Introduction -**

We consider, explainations the spatial association, spatial interaction, spatial behaviour and spatial diffusion. Explaination is diffrent from disription. explaination gives scientific status of Geography. It means in the study of explaination there is a logical reasoning.

- **meaning of explainations** - 'Why? and How? these are the fundamental questions in geography.

(i) The satisfactory & responsible answer to Why & How? quetions is called explaination.

(ii) Kisher - 'Geographical method may be jumped up an attempt to develop geographical method up to scientific method.

(iii) David Harvey - Purpose of explaination may be regarded an accepted some and expected out some of making circular event seen natural.

(iv) Attemp to ~~with~~ simplify the fact or events or process explaination of kind.

(v) Explaination is the process or end product of given an account of according for interpriting something and making it clear or intelligible.

With the help of explaination we can understand the geographical structure, law, theory, statistical techniques helps to understanding complex structure of the earth surface. Thus explaination is called 'puzzle solving activity'.

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Explanations in Geography

- David Harvey

In geography, where explainations have been attempt these have tented to be 'ad hoc' and unscientific form. This point has been carefully examined by Harvey, who has offered follwing explainations.

- Harvey recognised six forms of scientific explanations, covering methodological statments and generalizations from empirical studies.

* The explainations in geography put forwarded by Harvey to explain the general and empirical laws are as follows:

(i) **Cognitive Description**:

Under cognitive description are included collection, ordering and classification of data. No theory may be explicitly involved in such procedures, but it is important to note that a theory of some kind is implied. In the early stage of a disciplines development such theoratical assumptions may be amorphous and ill defined.

(ii) **Morphometric Analysis**:

Morphometric analysis thus provides a framework within which the geographers examines shapes and forms in space. Morphometric analysis can be lead to certain types of predictive and simulation models.

Example: The locational theories and the central places are the results of this type of analysis

- Geometrical predictions of this nature have had increasing significance in geography.

DATE

(iii) **Cause and Effect Analysis :**

The cause and effect analysis develops from the assumption that previous causes can explain observed phenomena. We look for causal relationships which are in their simplest form, of the type 'cause A leads to effect B'.

- Causal laws may be discovered by hypothetic deductive method or more simply comparing data from different phenomena in a region.

Example : The Black soil region of India with a cotton concentration.

The close relationship bet^n the black soil and the quantity of cotton output.

(iv) **Temporal Analysis :**

Temporal Analysis may also be termed as 'historical analysis' which is established a long period of time.

'The foundations of geographic study lie in geomorphology and historical geography'- both of which were dominated by temporal modes of explaination. e.g. Uniformitarianism.

In practice it will never be possible to understand such a comprehensive causal series; the analysis, therefore, must be restricted to some determined period of time.

(v) **Functional & Ecological Analysis :**

The cause and effect analysis was rejected by the positivist and counter to develop functional analysis.

'functional analysis attempts to analyze phenomena in terms of role they play within a particular organisation'.

Example : functional classification of towns, rivers analyzed role in denudation and so on.

- At the present time there are numerous geographers who regard ecological concepts as providing an important basis for geographic explaination.

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* **Steps for Scientific Explaination:**

For scientific explaination different steps are used as follows: (i) Identification of Problem.

(ii) Formulation of Hypothesis

(iii) Data collection

(iv) Analysis of Data

(v) Testing of hypothesis

(vi) Generalization (Theory, law is developed.)

- So explain the geographical complex problem with the help of law & theories is called as 'explaination'. This laws & theories plays important role in geographical explaination.

'Laws & theories are universal in nature'. They are acceptable all over the world. The laws & theories are formulated by two methods.

I. Deductive - (General to pertirular)

II. Inductive - (Pertirular to general)

* **Need of Explainations -**

Geography is a very complex subject. Nature and scope of geography is very vast. Today it is called 'spatial science'. The earth surface is main objective of Geography. There are many geographical problems. what? where? How these are fundamental questions in geography. for satisfactory and responsible answers of these questions explaination is needed.

* **Problems in Explaination:**

'There are many difficulties in geographic explaination called as a problem of explaination.'

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- Physical and Human these two major aspects are studied in geography. Many difficulties in the 'natural & social sciences'.

(I) Physical geography -

In physical geog. we can use the laws & theories for explaination geography, is the study of spatial organization. Quantitative techniques are created so many difficulties in geographic explaination.

(II) Human Geography -

Human behavioural aspects can not be explain with the laws and theories. Human behaviour vary from person to person. Thus human behaviour is very complex aspect to make the study.

* Approches of Explaination -

For giving explaination diffrent approches are used -

1. Law Approch -

Law is a universal statment or a scientific method truth, accepted all over the world. This truth is used for giving the explaination.

2. Relative Relationship Approch -

In geographical study one phenomena related to other phenomena. Explainations gives refrence to relationship of this phenomena. All phenomena are related to each other, e.g - Agricultural products are related to the technological inputs.

3. Model Approch -

The geographical phenomena is represented in the form of pictures, maps, aerial photographs diagrams etc. all these are models. This geog. models also gives the explaination about the geographical problems.

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Criteria used for Explaination :

- for giving the scientific explaination different criteria are used :

1. Statment criteria -

The explaination of geographical proble is given with the help of statments is called as statment criteria - There are many conflicts and dualisms in geography. To answer all these disputes law statment criteria is used.

Example : 'everything on the earth surface is determined by God.'

2. Scientific criteria -

Geographical problems are explained on the basis of scientific explaination in geography. In the laboratory scientific expriments are made and explaination is stated.

3. Historical criteria -

How the geographical phenomena originated? what changes the development taking place? what is the history of origin & development? answers of these ~~phenomena~~ quetions give the explaination of geographical phenomena. This is historical approch -

e.g. Evolution and development of rural settlment.

DATE

③ Space, Area, Region and Regionalization

a) Space -

interaction man at earth surface

In one sense space is a continious and the interaction of man over earth surface can be viewed as a total spatial system is made up of many different subsystem of the world wide.

Geographical space is divided continum of complex interlocking spatial system. In the same way it is possible to talk about the man-enviorment relationship as an ecological system. The physical enviorment varies so much that the relationship differ from place to place and there are many smaller ecological system within the overall system.

phy. envi. differ place to place.

The interaction of these smaller, spatial and ecological system seprate divide space up in to distinctive unit as 'areas' which is known as 'region' and which have been long intrest to the geographers.

space - area - region.

b) Area -

The ending of the 19th century the french geographers, Vidal-de-la-Blach called the areas of simillar cultural and physical charactaristics as 'Pays'

homogeneity / differentiate.

- An area having a homogeniety of the physical and cultural phenomenon.
- An area that is differentiate from other areas according to specific criteria.

In fact, the geographers main concern is how things are distributed over the earth surface. How the cultural and physical feature of areas different from place to place.

Geog distribution & differentiation phenomena.

DATE

c) **Region** -

Region is dynamic concept which has define diffrently by various geographers:

① Whittlessey (1924) - 'A differentiated segment of the earth surface'.

② 'An area having a homogeniety of the physical and cultural phenomena'.

③ 'An area i.e. differentiate from other areas according to specified criteria'.

④ Hartshorne (1959) - 'Region is relatively homogeneous

Classification of Region:

1. **Formal Region** -

It is geographical area which is homogeneous in terms of selected geographical criteria.
e.g. similar topography, climate etc.

2. **Functional Region** -

It emphasizes interdependence or linkage. which are neverthless functionaly interelated, obiviously the functional region is nodal region.
e.g: such as cities, towns & villages.

3. **The Programming Region** - 'Ad-hoc'

The programming region which is desined to serve a perticular purpose.
e.g. Tennesee Valley Authority in U.S.A. (TVA)

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* **Attributes of Region -**

① Region have location - e.g. SE Asia, NE Europe etc.
② Region has spatial extent - e.g: sahara desert, gang plai
③ Region have boundries - e.g. Himalaya, languages etc.
④ Regions may be either formal & functional.
⑤ Regions are hierarchally arranged - micro, meso, macro
⑥ Regions have transitional boundries.

d) **Regionalization:**

The regional method is a way to 'communicatio based on differentiation, philosophically, regionlization can be a more effective tool. Because the image obtain from the basic determinants at the spliting of a segment of the earth surface by classification of regional units are of academic intrest as called as practical.

classification & regional unit-

Although as many possible region exists as there are ① physical :- Topography, relief, climate, soils, vegetation, minerals etc. ② cultural :- religion, language, population, agriculture etc. ③ organization :- socio-economic institute phenomena.

* **Approches of Regionalization -**

- Further there are two approches of regionalization:

① Chorogenic Approch -

In this approch volume (terristrial region) is given, content must be determine.

② Topogenic Approch -

In this approch content is given, volume must be determine.

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* **Criteria of Regionalization -**

There are some criteria of regionalization has been putforward by King (1965) & Johnston (1968) there are:

i) The class intervals - for a frequency distribution should be mutually exclusive and exhaustive of original set of observation.

ii) Intra-class variability - should be minimum where as inter class variability should be maximum.

iii) Any problem has its solution in the form of regional trend as well as local effect combined together must be analysed seprately for regional trend & local effect.

iv) If any region of area has been divided into meaningful units according to the set of criteria, then spatial auto-correlation betⁿ units should be minimum and auto-correlation with in units should be maximum.

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⑥ Exceptionalism in Geography
(Regional Approch)

The father of exceptionalism is 'Immanual Kant' The term 'exceptionalism in Geography' is, however usually identified with 'Schafer'.

Define - "The belief that geography and history are methodologically distinct from other field of enquiry, because they are peculiarly concerned with the study of unique and the particular".

i. **Kant** -

Kant claimed exceptionalism 'not only for geography but also for history'. According to him history & geography find themselves in an exceptional position different from that of the so-called systematic sciences.

ii. **Schaefer** -

- Geography as the science of spatial arrangments was termed 'exceptionalism'.
- It claims that geography does not share the methodology of other seiences because of the peculiar nature of its subject matter - 'the study of unique places or regions.'
- To maintain that geographers are distinguished among the scientists throygh the integration of hetrogeneous phenomena which they aehive.

iii. **Hartshorne** -

- There is nothing exceptional in the philusophy (nature) and methodology of geography.

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- He stated that Human geography positioned in the category of social sciences rather than in humanities or natural sciences.
- Geography, he argued, must be like other social sciences and not 'exceptional'.

* Historical Perspective :

i. Greek geographers -

This viewpoint is called choreographic and chorological one, depending on the level of abstraction.

ii. Humboldt and Ritter -

Earlier recognized that the major concern of geography is to examine the manner in which the 'natural phenomena, including man, are distributed in space.'

iii. Kraft - agrees with them that geography is a science trying to discover laws that it is limited to the earth surface and i.e. essentially chorological.

iv. Hettner - 'both history and geography are essentially chorological' History arranges phenomena in time, geography in space.

-It may be summarized that both ~~Humboldt~~ Hartshorne and ~~Ritter~~ Schefer relied upon mainly German sources such as Kant, Humboldt and Hettner and both directed geographers towards spatial patterns.

- He also positioned human geography in the social sciences rather than the humanities or natural scienees.
- Geography, he argues, must be like other social sciences and not exceptional.

classmate

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a] Spatial Analysis -

'Unwin' (1981) presented spatial analysis as the study of the arrangments of points, lines, and surfaces of a map.

Define - 'The quantitative techniques employed in locational analysis is known as spatial analysis'.

- Spatial analysis got popularity during the period of quantitative revolution. It is closely associated with the philosophy of positivism.

- The goal of spatial analysis was 'precise quantitative description of spatial distribution, spatial structure and organization and spatial relationship.'

- The application of spatial analysis could be based on just three fundamental spatial concepts:
  (i) direction
  (ii) distance
  (iii) connection (or relative position)

• Criticism:

(1) It does not take into consideration the cultural values and normative quetions.
(2) Marxist and radicalist consider spatial analysis as a device to promote capitalism and exploit workers and enviorment.
(3) One of the main criticisms is that spatial analysis focused on spatial determinism.
(4) spatial analysis for man and enviorment relationship has been criticzed on several counts.

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b] Locational Analysis -

Bunge (1966) wrote a thesis on 'Theoretical Geography' based on geography is the 'science of locations'. McCarty, were strongly influenced by developments in the field of economics, to which they introduced spatial variable.

Define - 'An approch to human geography which focuses on the spatial arrangment of phenomena. It usual methodology is that of spatial location'.

- Locational analysis is based on the philosophy of positivism. The identification of theories of spatial arrangments and so is closely linked to the discipline's quantitative revolutions.

- Locational analysis is based on 'empiricism'. It's accords to special privilege to empirical observations over theoretical statments.

- Such has focus needed:
  (i) To adopt system approch
  (ii) To employ models e.g. liner model.
  (iii) To use quantitative techniques.

- Criticism -
  (1) The locational analysis based on positivism ignores the normative quetions.
  (2) It is did not reflect the reality of decision making processes.
  (3) The models developed with the help of locational analysis conceal the complexities of the real world.
  (4) The locational analysis has given a chance to the capitalists to 'optimize their profits.'

DATE

⑨ The Emergence of Geography as formal Academic Discipline from Varineous to Kant :

Varineous (1622 - 1650) :

- Bernard Varenious, known as Varenious, was born in 1622 in a village near 'Hamburg' in Germany.
- He studied philosophy, mathematics and physics at the University Hamburg.
- They were keen to learn more and more about to geographical conditions, trades, cities, people & socio-cultural conditions.
- His ultimately death, at the age of '28' in 1650.

Books :

Description regni Laponiae et siam (1649)
Geographia Generalies (1950)

- **Contribution -**
- He was the first geographer to divide geography in to 'general or universal' geography and 'special geography' or 'chorography'.
- Varineous was the 1st scholar who laid the foundation of the dichotomy of 'systematic' VS 'Regional' geography.
- The special geography which deals with the special features of different countries and regions may be termed as 'regional geography' while 'general geography'.
- He brought together contemporary knowledge of astronomy and 'cartography'.
- Verenius were mostly the followers of ptolemy who believed in the 'geocentric concept' of the universe i.e. the 'earth is centre of the universe.'

DATE

- He was 1st scholar show highest temprature recorded near the tropics in hot desert in the world.

Immanual Kant (1724 - 1804):

- Kant was born on April 22, 1724 at Konigsburg.
- He was mainly intrested in philosophy, mathematics and natural sciences.
- He freed geography from its tight bonds with 'theology'

Books:

i. General Natural History and Theory of the Heavens (1755)
ii. Critique of Pure Reason (1781)
iii. Critique of Judgment. (1790)
iv. Anthropology from Pragmatic point of view (1798)

- **Contribution -**
- Kant was mainly intrested in 'physical Geography'
- Concept of 'space', hes asserted that space is a relative view which consists of system of relations among substance.
- Geography and history fill up the entire circumference of our perceptions: geography that of space, history that of time.
- Kant used the word 'chorographic' meaning descriptive to describe geography.
- He was the first who provided an early statment of geography as 'chorology'.
- The history of geography should be divided in to two periods - 'before Kant and after kant'

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- The Period of Varinius and Kant is also known as the 'Classical Period of Modern Geographical Thought'.
- Prior to the period of Varenius and Kant, geography was geo + graphy, largely descriptive in character.

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Rn value :			
0.00	0.30	High clustering	
0.30	0.59	moderate clustering	
0.60	0.89	Least clustering	
0.90	1.10	Random	
1.11	1.45	moderate uniformity	
1.81	2.15	High uniformity	
PH value :			
under	4.5	Very High acidity	
4.5	5.0	High acidity	
5.0	5.5	moderate to High	
5.5	6.0	moderate acidity	
6	7	slight acidity	
	7	Neutral	
7.0	7.5	slight alkalamity	
above	7.5	strong alkalamity	

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Nearest Neibourris techniques.
Rn value 0 to 2.15

0 — closely cluster
1 — Random
1.15 - far away to each other.

2.15 - maximum uniformity.

PH value of the soil contents
Acidic — 4.0 - 4.5
Nutral — 7
Alkaline — above 7.

PH value soil

very High acidity - under 4.5
High acidity. - 4.5 - 5
Moderate to High - 5 - 5.5
Moderate acidity - 5.5 - 6.
Slight acidity - 6 - 7
Neutral - 7
Slight alkalinity - 7.0 - 7.5
Strong alkalinity - 7.5 - above.

SOI (Survey of India)	- Dehradune
ISRO (Indian space & Research Organisation)	- Banglore
NRSC (National Remote sensing centre)	- Hyderabad.

	Map Type	Cartographer
1.	Isopleth Map	- Filiph Buche. (1737)
2.	Nature's Map	- Major Lehman
3.	Spot Height Map	- Krishnofer Packki (1849)
4.	Colour & tint Map	- Steelar (1820)
5.	Shading Map	- H.K. Giggs.

INDIA :

1.	India's 1st accurate map constructed by	- James Renel (1783)
2.	First General surveyer	- Makenzzi.
3.	Map of south India	- Delisle
4.	SOI (Survey of India)	- Dehradune. (1767)
5.	[illegible]	- 1957.
6.	Geological Survey of India	- 4/3/1851

	Types of Toposheet -	Standard contour interval (SI)	Index no. of Indian Toposheet
1.	million	500	64
2.	One inch	50	64/16
3.	Half inch	100	64/NE
4.	Quarter inch	250	64M

million	1 : 20,000,00	500	1 : 50,000	64
¼ inch	1 : 2,50,000	250	1 : 1,00000	64M
½ inch	1 : 1,00000	100	1 : 2,00,000	64/16
1 inch	1 : 50,00,000	50	1 : 2,50,000	64/10

Indian Topographical map - 1" = 1 mile
International map 1° = 15·78 miles

	TYPES	USE
1.	Cadastral map	- Tax & Revenue
2.	Topographical map	- Natural & cultural landscape
3.	Wall map	- Continent, Ocean, country
4.	Atlas map	- Highly generalized picture physical & cultural.
5.	Relief map (orographic)	- mountain, plateau, plain.
6.	Geological map	- Geological structure, rock type.
7.	Climatic map	- Temprature, rainfall.
8.	Soil map	- Distribution of soil
9.	Political map	- Administrative division.
10.	Population map	- Popⁿ distribuⁿ, density, growth.
11.	Economical map	- crops, minerals, industries distribution.
12.	Historical map	- Historical events, Boundries, area.
13.	social map	- Tribe, language, religions distribution.
14.	Choropleth map	- Distribuⁿ showing with the help of different shades.
15.	Dot map	- Distribution of quantities.
16.	Isopleth / Isoline map	- Join equal value by lines on a map.
17.	Diagramatic map	- bar, square, circles show distribution
18.	Pie Diagram	- divided circle
19.	chorochromatic map	- use different colour e.g - forest - Green.
20.	choroschematic map	- Use initial letters e.g - wheat 'w'.
21.	Computer map	- convert analog map into digital map.
22.	Thematic map	- To show particular theme.
23.	Digital map	- formulated virtual image.

	Statistical Diagram	Uses
I.	One Dimention	
1	Line Graph (〰)	- Type of crops, minerals.
2	Bar & Line Graph (ılıl)	- at a time two elements show.
3	Pyramid Graphs (▽)	- Distribuⁿ of popⁿ R-U, SM-F.
4	Band Graph (▬)	- Industrial production
5	Bar Graph (▭)	- Different componant.
II.	Two Dimention	
6	Prapotional square (□)	- Distribution of elements.
7	Prapotional circle (○)	- crop, mineral production distribuⁿ
8	Divided Rectangulers (▭)	- single area different components
9	Pie diagram (◔)	- Different sub elements
III.	Three Dimentional	
10	Cube (◫)	- crop, mineral, popⁿ distribution.
11	Prapotional sphere (◍)	- Industries, population, Trade.
12	Block piles (▦)	- crop, mineral, trade condition.
IV.	Others	
13	Star Diagram (✳)	- wind direction; circle calm.
14	Triangular Diagram (△)	- Three type of data structure.
15	Scatter Diagram (⁘)	- Higher data range
16.	Pictorial Diagram (🍎, 🌳, 🌾)	- Use of fruit, vegetable diagram.
Crowley 18	Climograph	- Temperature & R. Humidity
19	Hythergraph	- Monthly Temp- and Rainfall
A. Geddes 20	Ergograph	- Season, climate & crops.
21	Histogram	- Distribution of frequency
22	Ogive curve / C.F. curve	- Use of cumulative frequency
23	Frequency curve	- Use bar upper point & connected

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Concepts :

1. Frequency Distribution - Large amount of information in a compact & systematic form.
2. Cumulative frequency - It is total no. of observations is less than or equal to a given value.
3. Arithmatic mean - It is sum of value divided by their total number.
4. Median - It is a value of varities mid-way arranged in order of magnitude.
5. mode - class having maximum frequency.
6. class interval - Upper & Lower class limit.
7. Arithmetic-frequency curve - The curve drawn to represent total area of land above each contour line as percentage of the total map.

Lorenz curve - max-o-Lorenz
- It is graphical method studying dispersion.
- Identify regions with variation of development.
- Used study distribut^n of profits, wages & turnover.

* Application of Lorenz curve - Aryar

Measure of Dispersion -

Ⓐ Range - The degree to which numerical data tend to spread about an average value.

(i) Range - Difference bet^n biggest value & smallest value.

(ii) Deviation -
- Criticised on range and used mid value of given data.

Q_1 - 25%. $\quad Q.D = \frac{Q_3 - Q_1}{2}$

Q_2 - 50%.

Q_3 - 75%.

(iii) mean Deveation - It is the mean of the departure of variant from the central value.

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Standard Deviation -
- This value helps in ascertaining the distance of a particular variate from mean in terms of s.d.
- s.d. is measure of dispersion value of data set.
- used functional classification of towns.

Coefficent of variation :
- "The SD expressed as the percentage of arithmatic mean".
- Higher the coefficent of variation, more scattered is the nature of distribution.

Coefficent of correlation -
- correlation means the dependence of one variable over the other i.e. how two or more phenomena are related.

(i) +ve - Irrigation increase, production also increases 'tve' correlated.

(ii) -ve - employment decreases, poverty also increases 've' correlated.

Regression :
- "To examine the relationship bet^n one dependent and one independent variable".

e.g.: Popl^n explosion - human are dependent & climate are independent.

Chisqure (χ^2) method - The difference bet^n the observed result and the theoratical result.

1. Nearest Neighbour Technique - introduced by - P. Hertz (1909)
   proposed by - Cleark and Evance
2. Ranking score method - Spearman's.
3. Coefficent of correlation - Karl Pearson's.
4. Least square method - Weaver
5. Maximum distance method - Raifullah
6. At crop & livestock combination - Coppock

6

Sampling Techniques

1. Simple random - every person participation e.g lotary method.
2. Systematic / quasi random - Select the popln at regular interval
3. Stratified random - Popln is hetrogeneous, srv. m-p.
4. multistage / cluster - Higher data structure. eg - state popln.
5. Quata - mutually exclusive subgroups.

E.M.R. velocity	- 3×10^8 m/sec^{-1}
Gamma Rays	- < 0.03nm.
X-Rays	- 0.03 - 300nm
U.V.R.	- 0.30 µm - 0.38 µm
Visible region	- 0.38 - 0.70 µm
IR	- 0.70 µm - 1mm
mw	- 1mm - 30cm
Radio	- 730cm.

Rayleigh's scattering - particle size smaller than wavelength of radiat
mie scattering - particle size similler to wavelength.
non-selective scattering - particle size larger than wavelength.
sensor - which collect informatn e.g. reading camera.
Platform - which remote sensor are mounted.

Geosynchronous - (ω → E) - speed match earth's within same space.
Sunsynchronous - (N → S) - Each area cover at local sun time.

Projections		Use
1. Mercator	→	Navigation
2. Gnomonic	→	Airways
3. Mollweide	→	World Distribution.

TIROS : (USA) - Television & Infrared observation satellite.
- 1st Remote sensor satelite of world (1960)

LANDSAT / ERTS - (USA)

NIMBUS (USA)

IKONOS (USA)

SPOT : (France) - System Probatoire d observation de la Terre.

RADARSAT : (Canada)

METEROS : (U.S.S.R.)

E.R.S : (Europe) - European Remote sensing satellite.

TUBSAT : (Germany)

KITSAT : (Korea)

NOAA : National oceanic & Atmospheric Administrative.

GMS : Geosynchronous metrological satellite.

INDIA :

1. Aryabhatta : Indias 1st satellite (1975)
2. Bhaskara : 1st Remote sensing satellite (1979)
3. Rohini; RS-1, RS-D1, D2, D3. - SLV - 3 test.
4. INSAT : Indian National Satellite.
5. IRS : Indian Remote sensing satellite.

Hydrop

1. Coefficent of correlation - Karl Pearsons

$$r = \frac{\Sigma xy}{\sqrt{\Sigma x^2 \Sigma y^2}}$$

2. coefficent of variation :

$$C.V = \frac{\text{std } S.D}{\text{mean}} \times 100$$

3) Skewness -

$$Sk = 3(\bar{x} - \text{median})$$

4) Nearest Neighbour technique - Clark & Evans

$$RN = 2d_0 \sqrt{n/A}$$

5) Standard Deviation :

$$S.D(\sigma) = \sqrt{\frac{\Sigma(x - \bar{x})^2}{N}}$$

6) mean $\bar{x} = \frac{\Sigma x}{n}$

7) median $\frac{n}{2} = \frac{n+1}{2}$ odd no, $\frac{n}{2}$ even no

1. Rotameter - used for measuring distance on map.
2. Planimeter - used for measuring areas on maps.
3. Pantograph - used for reduction of maps.
4. Pdiograph - used for measuring volumes.
5. Clinometes - measures angles & slopes of ground.
6. Theodolite - measuring angular distance in both the vertical & horizontal planes.
7. Psychrometer - The humidity of air.

1.	1° longitude at equator	- 111km.
2.	International date line deviates	- 4 times.
3.	Shape of earth	- Geoid.
4.	Earth diameter at equator 7900 miles & N-S pole - 7927 miles.	
5.	Indian standered time based on 'longitude'	- Chennai.
6.	Indian standered time based on 'meridian'	- Allahabad
7.	Topographical maps of India	- S.O.I.
8.	Topographical map of India scale	- 10,00,000
9.	World as a whole	- globe.
10.	Equal magnetic declination	- Isogones lines.
11.	Topographical map of India	- mercator projection.
12.	Height above the sea level calculated	- Dumpy Level.
13.	Imaginary line height & depth are measured.	- Datum Line
14.	Areal photograph in three dimentional	- stereoscope.
15.	Parallel differences in Areal Photographs	- Parallax Bar.
16.	Photograph recording wavelength	- 0.3 to 0.9 um.
17.	Speed & distance shown by	- Pace scale.
18.		
19.		
20.		

1. mercury pollution - minimata disease.
2. short day plant - Trillium.
3. DDT - Non degradable pollutant.
4. Symbol WWF - Red panda
5. Obsolescent - Endangered species.

1. Hydrophyte - submerged in water, plant adapted in wet climate.
2. Xerophyte - dry habitats.
3. mesophyte - water neither excessive nor deficent.
4. Cryptophytes - (Tundra) extreme cold condition & minimum insolation.
5. Halophyte - High salt content in its enviornment.
6. Tropophyte - one season Xerophyte & one season Hydrophyte.
7. Megatherm - equatorial vegetation.
8. Mesotherm - Tropical & subtropical vegetation.
9. Microtherm - cool temprate region.
10. Sclerophyllas - mediterreanean climate.
11. Phanerophyte
12. Phylam Aniieda - Coral animals
13. Polenesian subkingdom - Paleo tropical
14. Burnt soil plants - Pyrophilous.
15. Thermophyte - is an organism that grows best at temp. < 50°C.

1. Regosols - Earthy top soil, High degree organic content.
2. Vertisols - Tropical climates mainly on basic materials.
3. Ultisols - Equatorial climates.
4. Entisols - Recent or eroded unconsolidated material.
5. Alfisol - soils occurs deciduous, woodland or grassland regime.

Classification of animals on the basis of faunal Regions:

– A.R. Wallance

1) Palaearctic – Europe, middle & north Asia, North Africa.
2) Nearctic – North America & Greenland.
3) Oriental – south & south east Asia.
4) Ethopean – whole Africa south of sahara, sw Arabia, Madagascar.
5) Neotropical – whole of South America.
6) Australian – Australia, Newzeland & Tasmania.

1.	Ecology	– Ernst Haeckel
2.	Ecosystem	– A.G. Tansley
3.	Trophic Level	– Lovejoy (later) Rosen (1486)
4.	Biodiversity	– R.L. Lindman
5.	Biodiversity Hot spot	– Norman Myers
6.	Island Biogeography	– MacArthur Wilson.
7.	Ecological conscience	– Aldo Leopold
8.	'Ecological dominant' organism	– Carl Sauer
9.	Age of Poisons	– Rachel carson
10.	Eco-development	– Maurice strong
11.	'Kababul' change name 'subabul'	– Indhira Gandhi
12.	Act locally think Globally	– Anonymous
13.	Planet Protection Fund	– Rajiv Gandhi
14.	Debt for Nature	– Thomas E Lovejoy

1. Ecotone – the transition zone bet^n two ecosystem.
2. lenthic ecosystem – lake, pond.
3. lotic ecosystem – river, spring.
4. Climax – ecological succession normal leads to climax.
5. esturies – Transition zone bet^n marine & fresh waters.
6. Flow of energy – one trophic level to next.
7. food web – complex network of food chain.
8. food chain – transfer of food energy.
9. Dendrochronology – study of annual growth rings in species of trees.
10. Dormancy – Desert animal adopted hottest & driest season.

1. Rally for valley : 'Arundhati Roy' for enviormental Degradation.
2. Bay of Bengal : Large marine ecosystem.
3. Tera Rossa soil - Tropical Region.
4. pH of soil indicates - It's chemical reaction.
5. Valley of Death - Cubatao, Brazil
6. Deseard of joyriders - California.
7. Valley of flowers - Garhwal Himalayas
8. Worst soil erosion of world. - Himalayan foothills.
9. largest strech of mangrove. - Dangladesh.
10. Oceanic desert - Sargasso sea.
11. Polygon of Drought - Sao Raimundo, Brazil
12. 'fertile crescent' of world. - Around syria.
13. Slogan 'Development is best contraceptive' - Karan singh.

Montreal Protocol : (1989) - reduce ozone depletion substances.

1. Act locally think globaly - Anonymous
2. Kubabul afforestsation, to subabul' - Indhira Gandhi
3. Ecodevelopment - Maurice strong
4. Our era the 'Age of Poisons' - Rachel carson
5. Ecologically dominant organism' as a man - Carl Sauer.
6. Tyranny of small decisions - Alfred E. Khane
7. Debt-for-Nature swap - Thomas E. Lovejoy
8. natural enviorment as an outlet 'open end' - Henry David Thoreau.
9. Planet Protection Fund w.r.t. General Assembly - Rajiv Gandhi.

Development in the best contraceptive -Karan Singh.

1. Wild Life Act (1972)
2. Project Tiger (1973)
3. Project crocodiel (1975)
4. Project elephant (1992)
5. forest, conservation act (1980)
6. Enviormental Protection Act (1986)
7. national forest policy (1988)
8. The central pollution contro) Board (1974)
9. The water Prevention & control of Pollution. (1974)
10. National water policy (1987)
11. Central Ganga Authority (1985).
12. The national river conservation plan (1985)
13. The air prevention & control of pollution act - (1951)
14. Noise Pollution (2000)
15. Bio diversity Bill (2000)
16. Biosafty Protocol (2002)
17. Wild Bird & Protection (1987)
18. Protection & maintanance of ozone layer 'montrol Protocol' - (1987)
19. Reduction in the emision of co2 - Toranto world conference (1988)

Montreal Protocall - ozone depleching (1989)

1.	Gleization	- fresh water marsh	
2.	Calcification	- High temp. & seasonal rainfall.	
3.	Illuviation	- Deposition of soluble mineral in the lower layers.	
4.	Eluviation	- Removal of soluble minerals from upper soil layers	
5.	Vertisol	- The soil which cracks & shrinks most as it dries.	
6.	Pedon	- Artificialy formed soil mass.	
7.	pH paper	- Tested acidity of soil.	
8.	Capillary action	- Salt crust below surface soil in desert region owing.	
9.	Red soil	- equatorial region.	
10	Podzol soil	- Hot-humid, coniferous forest region.	
11.	Terra Rossa	- Tropical region soil.	
12.	Rendzina	- calcimorphic soil.	
13.	Sierozems	- Grey Desert soil found in mid latitude.	
14.	Mallee	- Commanly found semi-arid part of W & SE Australia.	
15.	Mulga	- semi-arid scrub vegetat" mainly Acacia in Australia.	
16.	Baobab	- equatorial forest.	
17.	Savanna climate	- Scrub	
18.	Taiga Biome	- Douglas fir	
19.	Quebracho	- Brazil	
20.	Eucalyptus	- SE Australian forest.	
21.	Nitrogen fixing	- Gram & other pulses.	
22.	C, P, N, O recycled	- Bio-Geo-chemical cycle.	
23.	Halosere	- saline habitat vegetation.	
24.	Ecological pyramid	- man top of position.	
25.	Ecological Efficency	- Energy transfer from 1 trophic level to another level.	
26.	Vent	- most recently discovered ecosystem.	
27.	Lichens	- major part of Antartica vegetation.	
28.	Ecologists	- Three major zones.	
29.	Matrix Method	- Enviormental impact Assesment.	
30.	Eutrophication	- accumulation of nutrients in a body of water & resultant enrichment.	

① Soyabean → China
② Tea, Banana → India
③ Cocoa, Tobaco → S. America
④ watermelon → Africa.
⑤ maize → Cuba

31.	endemic	- biotic life not flourishing anywhere.	
32.	in situ	- national park	
33.	ex situ	- Botanical garden, zoo, Gene bank.	
34.	Valley of Death	- Cubatao, Brazil	
35.	Oceanic Desert	- Sargasso sea.	
36	Valley of flowers	- Garhwal Himalayas.	
37	Polygon of Drought	- Sao Raimundo, Brazil.	
38	Waldsterben	- Forest sickness.	
39	Geiger-Muller detector	- Nuclear radiation.	
40.	eco Freeze	- Halting ecological degradation.	
41.	skin cancer	- Ultra violet radiation.	
42.	Europe industrial sewer	- Rhine.	
43.			
44.			
45.			

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CONCEPTS

1.	Uniformitarianism - 1st used William Whewell (1832)	- James Hutton
2.	Base Level	- J.W. Powell
3.	Dynamic Equilibrium propounded (Hack theory)	- G.K. Gilbert
4.	The Great Denudation (Colorado Plateau)	- C.E. Dutton.
5.	Uniformitarianism propounded -	- Playfair & Lyell.
6.	Palimpsest (Historical study of landscape)	- British school
7.	Ice Age	- J.D. Carpenter
8.	mass wasting	- Sharpe
9.	Geosyncline, elaborated - (Haug)	- Hall & Dana.
10.	Escarpment	- R.J. Chorley
11.	Paleomagnetism	- W.G. Vine & matthews
12.	Trios	- W.M. Davis
13.	Entwickelung (development)	- Walther Penck
14.	Piedmonttreppen	"
15.	Endrumpf (Endrumf)	"
16.	Peneplain	- W.M. Davis
17.	Basal slapping	- Marbut
18.	Pedocals & Pedalfer	- Johnson.
19.	Isostasy (1859)	- Dutton.
20	~~Meteorites~~	
21.	~~Asteroids~~ Plani	
22.	Law of unequal slope	- G.K. Gilbert
23.	Graded stream	- G.K. Gilbert
24.		
25.		

THEORY

1.	Fault Theory	- W.M. Davis
2.	Erosion Theory	- J.B. Spurr
3.	Geosynclinal orogen Theory	- Kober
4.	Thermal contraction Theory	- Jeffery
5.	Sliding continent Theory	- Daly
6.	Thermal convectional current Theory	- A. Holmes
7.	Radioactive Theory	- Joly
8.	Horizontal Displacment of continent (1910)	- F.B. Taylor
9.	Continental Drift Theory (1912)	- Alfred Wegener.
10.	Plate Tectonic 1st used Tuzo Wilson (1965)	published - W.J. Morgon (1967)
11.	Sea floor Spreading (1960)	- Harry Hess
12.	Tetrahedral Hypothesis (1875)	- Lawtin Green
14.	Geographical Cycle (1899)	W.M. Davis
15.	Arid cycle of Erosion (1903)	
16.	Glacial cycle of Erosion (1906)	
17.	Slope Evolution	
18.	Karst cycle of Erosion	- Biddee (1911) & Civijic (1918)
19.	Marine cycle of Erosion	- D.W. Johnson (1919) & W.M. Davis (1912)
20.	Recession Theory	- A.C. Lawson.
21.	Sheet Flood Theory.	- W.J. McGee
22.	Lateral Erosion Theory	- G.K. Gilbert
23.	Composite Index	- Breyan, Davis, Sharp.
24.	Periglacial cycle of erosion	- Peltier
25.	Glacial Protection Theory	- Garwood
26.	Episodic erosion model	- S.A. Schuman
27.	Geomorphic Threshold model &	M. Morisawa
28.	Techtonic Geomorphic model	
29.	Glacial Erosion Theory	- W.H. Hobbs.
30.	Bergschrund Theory	- D.W. Johnson

Ice age was first put forwarded ~~carpenter~~ carpenter, Charpentier, Playfair, Venetz, Esmark.

1.	Glacial geomorphology	- James Geikie
2.	Marine Geomorphology	- Sir Andrew Ramsay
3.	Aeolin Geomorphology	- J. Walther, Passarage.
4.	Golden Age of Geomorphology (N. America)	- 1875 - 1920
5	Geological History of Earth	- F. Press & R. Siever
6.	Bad Land Topography	- Rainstorm.
7.	Glacial Period: Gum, Mindel, Riss & Wurm	- Penck & Brueckner
7.	Parallel Retrate	- Walther Penck
8.	Recession / retrated back	- W.M. Davis
9.	Pediplain	- L.C. King
10	Geomorphological approch of slope development	- Allen wood.
11.	Peneplain	- W.M. Davis.
12.	Pedruft	- Walther Penck
13.	Punplain	- C.H. Crickmay
14	Pediplain	- L.C. King
15.	Etchplan	- Pugh & Thomas
16	panfan	- A.C. Lawson.
17.	Microclimatology	- Petterson
18.	Geomorphology	- Griffith Taylor
19.	Meteorology	- ward
20	Hydrology	- Worchester
21.	Savana Cycle	- Thomas & Pugh
22.	Time dependent landform	- Davis
23.	Tectonogeomorphic model	- Marie Morisawa
24.	Episodic erosion Theory	- Schuman & Lichty

1. "no vestiage of a begning, no prospect of end!" - James Hutton

2. 'Egypt is Gift of Nile' - Hirodotus

3. Die Entenburg Der Kontinent and ozeane Corigin of continent & ocean) - Alfred wegener.

4. All movments are related & made relative to Africa - Pangea.

1.	Meteroites	- Extra terristrial matter.
2.	Asteroids	- Roky bodies 800km diameter.
3.	Meteorids	- small fragments rock.
4.	Comets	- Huge cloude surround the solar system.
5.	Etchplain	-
6.		
7.		
8.		
9.		
10.		

BOOKS

1.	Physical Geography	- Strahler
2.	Principle of Geomorphology	- Thornbury
3.	Unstable Earth	- J.A. Steers
4.	Essay of Geomorphology	- L.C. King
5.	Morphology of Earth	- C.H. Dury
6.	Techniques in Geomorphology	- C.A.M. King
7.	The Great Ice Age (1894)	- James Geikie
9.	The Earth	- Jefferey.

1.	Glacier classified	- H.W. Ahlmann.
2.	Great Desert Provinance	- Five
3.	Extremly fine particulate matters	- Haze
4.	Swirling movment of fluid	- Eddy
5.	Stony & Rocky Desert	- Hamada.
6.	Badland are found	- South Dakota USA.
7.	Best Institue of Seismology in India.	- Roorkee.
8.	Seismic Map of India	- Jandhang (Andhra).
10.	Indias 1st earthquake	- Kumaon 1803
11.	Kakratoa Volcano eruption	- 1883
12.	Highest volcanic mountain	- Cotopaxi (19613 ft)
13.	Volcanic eruption Hypothesis postulated	- Daly

Rocks & their metamorphosed forms:

1. Granite → Gneiss
2. Basalt → Greenstone
3. Limestone → marble
4. Sandstone → Quartzite.
5. Graphite - coal
6. Slate - clay
7. Quartz - sandstone.

Rocks:

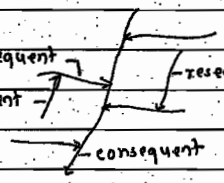
1) Igneous -
- magma & Lava, Parent rock, Primary rock.
e.g. Granite (intrusive) & Basalt (extrusive) etc.

2) Sedimentary -
- layered rock, largest area covered (75%), fossils found.
e.g: Sandstone, Limestone, Loess, clay rock, dolomite. etc.

3) Metamorphic -
- rock composition change without disintegration.
e.g. marble, schits, slates, gneiss, quartzites.
(fetd = feldspar)

Intrusive rocks

1. Batholith - long, undulating forms, side wall steep.
2. Laccolith - mashroom shape
3. Phacolith - wave like, anticline & syncline
4. Lopolith - Bowl shape, concave shallow basin.
5. sills - parallel to bed.
6. Pykes - 1st to the bed.



(i) Antecedent - river maintain previous course, before upliftment.
e.g. Brahmputra, Ganga.

(ii) Superimposed - river maintain flow, directly valley as uuvala.

1. Trellise - folded structure (syncline & anticline), grapes vine.
2. Dendritic - rootless of tree, e.g. Ganga, Krishna, Indus.
3. Rectangular - Tributaries meet right angle
4. Radial/centrifugal central higher point eg- Srilanka
5. centripedal - central lowland | basin | Lake.
6. Annular - Radial + consequent at top of dome shape.
7. Barbed. - tributries join to master stream hook shape.
8. Pinnate - narrow valley, steep ranges.
9. Herring Bone - rib pattern

बहुत -ही विस्तृत जानकारी नहीं आवश्यक नहीं.
संक्षेप -मात्र जानकारी - परिचय, दक्षिण मैदान, मोनर्क -

1.	Crust width	- 33km.
2.	Sima minerals	- Basalt
3.	outer mantle width.	- 92-700 km.
4.	mantle Density	- 3.1 to 5.57 gm/cm^3
5.	core Density	- 13.3 to 13.6 gm/cm^3
6.	core Diameter	- 6942 km.
7.	Asthenosphere	- Bending & Deforming.
8.	Transit Deep waves	- Oscillatory waves
9.	Zone of surf	- Littorial current
10.	Continental slope	- Back shore.
11.	Lagoon	- Coral Reef & fore shore.
12.	Divisions of earth's interior SIAL, SIMA & NIFE	- Suess
13.	Earth age	- 4500 million yrs.

1.	Ocean - Ocean collision	-	Japan situation
2.	Ocean - Continent collision	-	Cordillerean "
3.	Continent - Continent collision	-	Himalayan "
4.	Continent - arc collision	-	Irian "

1.	Rhurian Delta	→ Rhine
2.	Bird foot Delta	→ Mississipi
3.	Cuspate	→ Ebro
4.	Arcuate	→ Nile.

Sial x sima - Conrad Discontinuity
Lower crust x upper mantle - mono Discontinuity
upper mantle x Lower mantle - Repetti Discontinuity
mantle x core - Guttenburg Discontinuity
Outer core x inner core - Lehman Discontinuity

Earth's Interior :

1. Density -
Crust avarge density of earth - 5.5 gm/cm^{-3}.
surface - 2.6-3.3 grm^{-2} core - 11 gm cm^{-3}

2. Temprature -
- 1°c / 32mt. ↑ increasing depth.
- 100 km - 1100°c, 2900 km - 3700°c 5100 km, 4300°c, centre - 4800°c.

3. Pressure -
- surface - 14.7 mb mantle - 3200 - 23800 lb. core - 32900 - 36400 lb.

4. SIAL (Silica + Aluminium)
- Density - 2.9 , Thickness - 30-300 km.

5. SIMA (Silica + magnesium)
- Density - 2.9-4.7 ; Thickness - 1000 - 2000 km.

6. NIFE : (nikel + ferium).
- Silicon : 20%. , Iorn & nikel : 80%.
- Density : 11 Diameter : 6880 km

7. Crust :
- Thickness - 30km. Density : 2.8 - 3.0 , P-waves : 6.1 - 6.9 km/s.

8. mantle :
- 83%. volum & 68%. - mass.
- extend : 30 - 2900 km. Density : 4.6 g cm^{-3}.

9. Core ;
- volume : 16% ; mass : 32%.
upper outer core - S waves dis appear, liquid state, molten rock.
inner core - P waves travel ; solid state.

10. Lithosphere - Crust + upper mantle 50 - 100 km
11. Asthenosphere - upper mantle 200 - 1000 km
12. Mesosphere - Lower mantle 2400 - 2700 km.

Seismology:

1. - Focus - place of occurance of earthquake.
2. - Epicentre - Seismic event exprence 1st
3. - Depth - 700km (maximum)

4. P waves - Primary / longitudnal / compressional.
5. S waves - Secondary / Transverse / Distortional.
6. L waves - Surface.

7. P-S waves - maximum velocity - 11.32 km/sec. 7-8 to 4.5 km/sec.
8. Pg-Sg waves - minimum velocity - 5.4 to 3.3 km/sec.
9. P* - S* waves - medium velocity - 6.7 to 4.4 km/sec. 6.7. 4 4.5 km/sec respectively.

Intrusive volcanic Topography -

1. Batholith - Bottom & very steep side wall.
2. Lacolith - mushroom shape
3. Phacolith - wavelike
4. Lopolith - Bowl shaped
5. Sills - parallel to plane
6. Dykes - perpendicular to bed. Metamorphosed forms:

River	Delta
1. Ganga	Arcuate
2. Mississippi	Bird foot
3. Nile	Estuarine
4 Rhine	arcuate

1. Granite → Gneiss
2. Basalt → Greenstone
3. Limestone → marble
4. sandstone → Quartzite
5. ~~Graphite~~ Clay → slate
6. ~~Slate~~ Coal → Graphite

factors controlling Landform Development:

a) Endogenetic forces:
1) Sudden forces - Earthquake, volcanoes.
2) Diastrophism forces -
   (i) Epirogenetic - Upward, Downward.
   (ii) Orogenetic - compressional (fold)
   Tensional (fault).

folds	faults
1. symmetrical - ∧	1. Normal - ⟷
2. Assymetrical - ∧	
3. monoclinal - ⌐	2. Reverse - ⊏→ ←⊐
4. Isoclinal - ⌐	
5. Recumbent - ⌐	3. Thrust -
6. overturned - ⌐	
7. plunge - ⌐	4. Transcurent / strike-slip -
8. fan fold - ⌐	
9. Openfold - two side of fold	5. Step fault -
10. close fold -	
11. ~~Type~~ Nappe - thrust fault & overt upfold	

b) Exogenetic forces -
1) weathering -
   (i) Physical - temprature, rainfall, ice, wind, insolation.
   (ii) Chemical - oxidation, carbonation, soln., chelatn, Aquite, Olivine, Hydrolysis
   (iii) Biological - plant, animal, man.
2) trosion - fluvial, Aeoline, glacial, sea, karst etc.
3) mass wasting - (i) slow flowing
   (ii) Rapid flowing
   (iii) Landslide.

* Isostasy - 'Dutton'
1. Uniform density with varying thickness - Airy
2. Uniform thickness with varying density } Pratt.
'compensation line'
3. Plane of compensation (100km) - Bowie & Hayford.
4. Zone of compensation (16 km) - Joly
5. Density varies vertically & Horizontally - Heiskenen

Geological History:
- Press and Siever

1) Pre-Paleozoic Era.
I. Precambrain
2) Paleozoic
I. Cambrian
II. Ordovian
III. Silurian
IV. Devonian
V. Carboneferous - coal formation
VI. Perminean - Applacian
3) Mesozoic -
I. Triasic
II. Jurassic
III. Creataceous - formation of Rockies, Andes, Alps, Himalaya, Peninsular India. (Tertiary mountains / Alpine)
4) ~~Eocene~~ Cenozoic:
I. Eocene - Indian & Atlantic ocean formation of Himalayas.
II. Oligocene
III. Miocene
IV. Pliocene - Siwalik origin, Arabian & black sea formed.
5) Neozoic -
I. Pleistocene - Ice age, 4 glacial period., Great lake (USA)

e) Glaciated Topography:

* Process:
I. Abrasion
II. Plucking
III. Nivation
IV. Scrapping

* Erosional Landform:
I. Cirque / corrie
II. Arete
III. Matterhorn.
IV. Nunatak / Glacial island.
V. U shaped valley
VI. Hanging valley
VII. Roche mountain - D. Sauer viewpoint.
VIII. Crag & Tail
IX. Trough lakes
X. Tarn
XI. Fiord

* Depositional Landforms:
I. Morains
II. Drumlins
III. Eskers
IV. Kames
V. outwash plain
VI. Kettle.

Europe हिमयुग — GMRW Gunz, Mindel, Riss, Wurm.
USA Ice age - Gerstan, Kansas, Illinoian, Wisconsin

a) Fluvial Erosion :

* Process.

i. Solution / corasion
ii) Abration / Corasion
iii) Attrition
iv. Hydrolic Action

* Erosional Landform :

i. V shaped valley
ii. U shaped valley
iii. Canyon
iv. Pot Hole
v. Waterfall
vi. Rapids
vii. meander
viii. ox-bow lake
ix. Peneplain.

* Depositional Landform

i. Alluvial fans
ii. Alluvial cones
iii. Flood Plain
iv. Delta
v. Levees.

b) Karst Topography -

* Erosional Landform -

i. Lapies / Bogaz / Grykes / karren.
ii. Sink hole / Avens
iii. Swallow holes
iv. Dolines / Drip stones
v. Poljes / Uvalas.
vi. Cavern
vii. Natural bridge
viii. Ponores / Avenes.
ix. Blind valley
x. Jamas.
xi. Felsenmeer - Hydrofracture

* Depositional Landform.

i. Stalactites
ii. Stalagmite
iii. Cave Pillar (Pious)
iv. Speleothem
v. Travertine
vi. Dripstone
vii. flowstones
viii. cockpits
'Terraresa'

Richthofen - Transverse coast'

Ria - Italy - ভূমিকম্প দ্বারা সৃষ্টি পাহাড়ি রিয়াস।
Fiord - হিমবাহের দ্বারা সৃষ্টি পাহাড়ি ফিয়র্ডের - নরওয়ে, গ্রিনল্যান্ড।
Dalmatian - ভূমিকম্পের দ্বারা সৃষ্টি পাহাড়ি - যুগো-স্লাভিয়া।

c) Coastal Erosion :

* Processes :

i. Hydrolic action
ii. Abration / corasion
iii. corasion / solution.

* Erosional Landform

i. sea cliff
ii. sea caves
iii. Sea caves
iv. Bay & Headland
v. Arch
vi. stack & stump
vii. Chimney
viii. Inlets
ix. wave cut platform.

* Depositional Landform :

i. Beaches
ii. Sand Bars Brazil - lagoda patos
iii. Lagoons
iv. Spits
v. Sand Dunes
vi. Tombola - Italy
vii. Geos & Gloups
viii. Barrier islands
ix. Tidal inlets
x. Progradation
xi. winged Headlands
xii. wave-built platform

d) Aeolian Landform :

* Process :

i. Deflation.
ii. Abration
iii. Attrition

* Erosional Landform -

i. Deflation basin / Blow outs / desert hollow
ii. mashroom / Pedastral / Gara / Pilzfelsen.
iii. Yardang
iv. Zeugen
v. Dsikelan / ventifacts / zweikanter.
vi. Demoiselle
vii. Inselberg / Bornhardt.
viii. Stone Lattice.
ix. wind window.
x. mesa.

* Depositional Landform :

i. Loess
ii. sand Dunes
iii. Barchan
iv. Self Dune.

* Fluvial Desert Landform :

i. Badland
a. Bajada
3. Bolson
4. Playa / Khaban
5. Pediment.
Hamada : Rocky Desert
Reg : Stony Desert

* Swash - ઢોળાવ પર ઉપરની તરફ
Backswash - એ પાણી પાછું દરિયામાં જાય છે.

*	Isostasy	- Dutton (1859)
I.	Uniform density with varying thickness	- Airy
II.	Uniform density with uniform thickness	- Pratt
III.	Plane of compensation (100 km)	- Hayford & Bowie
IV.	Zone of compensation (16 km)	- Joly
V.	Rock density varies vertically & horizontally	- Heiskanen

Shields :
'A regional surface of low relief having an elevation of within a few meters of sea level & broadly convex'.

Slope Development –

Davis –
- Normal Cycle of erosion : Humid Temprate climate.
- Recession, ~~parallel~~ Retreat Backs.
- Wearing back & wearing down.

Penck –
- Die morphology Analysis
- Parallel Retreat.
- Halden Hang.

L.C. King –
- Problem of Slop Development.
- Morphology of Earth
- Pediplane.

A. Wood –
- Geometric approch of slope development.
- steep slope, free face.

Precambrian Period : 700 million B.P.
- earth change gaseous in to liquid state

Bajada : 'A type of alluvial plain, occuring towards the centre of intermontane basins in arid or semi arid areas are called Bajada.'

Playa : 'A flat basin in an arid land, which may become covered with water periodically, is called playa'. e.g. Rann Basin.

Pediment : 'An eroded rock platform, cut into the bedrock, usually slightly concave and triangular in shape is called pediment'.

Bolsons : The intermontane basins in arid or semi arid areas are called Bolsons'

Backshore : The zone of shallow bottom of the continental slope.

Offshore : The beach zone starting from the limit of frequent storm waves to the cliff base'.

Foreshore : 'The low water zone & high tide water zone'.

1.	Volcanic ash rock called as.	- Tuff
2.	Extrusive igneous rock	- Pumice
3.	Division of earth interior sial, sima, nife	- Suess
5.	Age of earth	- 4500 million yrs.
6.	Asthenosphere floating	- Peridotite
7.	The roof of world	- Pamirs
8.	East African Rift valley	- Sudan to R. Lambize.
9.	Largest rift valley of world	- Africa
10.	Buoyant Equilibrium is called	- Isostasy
11.	Important evidences of continental drift	- Permo-carboniferous glaciation
12.	evidences of sea floor spreading	- Linear magnetic anomalies
13.	Discovery of continental drift	- Paleomagnetism.
14.	Causes of Pacific plate movment	- Slab pull.
15.	major plates	- Seven/6
16.	Highest activ volcano in the world	- Cotapaxi
17.	most explosive type of volcano	- Plinean type.
18.	small mount of spatter & dribelt	- Hornitos
19.	Instrument record warps of volcanoes	- Tiltmeter
20.	Isolated hill surrounded by lava flow	- Steptoe
21.	mud flow of volcanic cones means	- Lahar
22.	lava flow crater a flank	- Coulee
23.	Dome grows pre-existing crater	- Tholoid
24.	explosive crater occupied lake	- maars.
25.	Alpine Himalayan chain formed	- Tertiary (5 million yrs ago)
26.	Bulging fences & walls tree trunk	- Solifluction.
27.	Rock stream areas relics frost wedding	- Felsenmeer.
28.	Stalus slope & constant slope angle	- 35°.
29.	Mechanical wear by river, wind	- Corrasion
30.	chemical wear by	- Corrosion
31.	chemical weathering	- cool temprate climate
32.	weathering takes place	- Insitu
34.	Processes bring land surface common level	- Degradaction.
35.	Davis idea of time & evolution from	- Darwin
36.	Frost heaving process	- Periglacial enviornment.
37.	Landforms several cycle take place	- Polycyclic Landforms.
38.	End product of Penck cycle	- Endrumpf
39.	A break in long profile of the river	- knick point
40.	Combined work of erosion & deposition	- Natural Levees.
41.	Mort lake is common	- Flood plain.
42.	Two river join a common level	- Playfair Laws.
43.		
44.		
45.		
46.		
47.		
48.		
49.		
50.		

CONCEPTS

1.	Social Geography - 1st used	- Russel-de-france (188
	propounded	- Valeus (1909)
2.	Socio-economic model	- Chorley & Haggett
3.	Race word - 1st used	- Fox (1950)
	Book -	'Book of martyrs'
4.	Classification of Races	- A.C. Haddon & Krogma
	Book	- 'The Races of man'
5.	Liqulstic survey of India	- Georg Abrahm Garison
6.	Social well being - 1st term used	- Dranovcik (1974)
	popularised	— David m. smith
	Book - The state of social - well being	(Russian)
7.	Cultural Geography	— Carl-o-sauer.
8.	Cultural Realm	- Broek and webb.
9.	Cultural Hearth	- Barkely school of Geograp
		under 'Carl-o-sauer'

	RACE	
ndia :		
1.	Negrito	- Andman & Rajmahal hills.
2.	Proto-Australoids	- central & S. India (Santhal, Bhill, Kol)
3.	Paleo mangoloid	- Himalaya, Assam & manipur.
4.	Tibeto mangoloid	- Bhutan, sikkim, NW Himalaya & Trans.
5.	Paleo mediterraneans	- Tamilnadu & Andhra.
6.	Oriental Mediterraneans	- Punjab, Rajsthan.
7.	Alpinoids	- Gujrathi, Kathiwar, Banias.
8.	Dinaric	- Bengal, orissa & coorg.
9.	Armenoids	- Parsi Bengali
10.	Nordics / Indo Aryan	- Punjab, Haryana, NW pak, RJ, J&K.
	Deomographic relaxation theory - over popl^n causes war	
orld :		
1.	Nordics	- NW europe
2.	Negro	- Guinea coast.

	TRIBES	
1.	Gond	- Madhypradesh & Bihar
2.	Bhill	- Madhypradesh & Rajsthan.
3.	Santhal	- Bihar & Orissa.
4.	Minas	- Rajsthan
5.	Oraon	- Jharkhand, BJ, Orissa.
6.	Munda	- Orissa
7.	Khond	- ~~Bihar~~ Bihar, Or, WB.
8.	Gujjars	- J & K
9.	Bakharwals	- J & K
10	Naga	- Nagaland
11.	Garo	- meghalaya
12.	Khashi	- Meghalaya
13.	Toda	- Nilgiri (TN)
14.	Uralis	- ~~Andama~~ Kerala
15.	shompens	- Andaman & Nicobar
16.	Onges	- A & N
17.	mikirs	- Assam
18.	Murias	- Bastar (MP)
19.	Lushais	- Mizoram
20.	Lepchas	- Sikkim
21.	Kukis	- manipur
22.	Kotas	- Nilgiri (TN)
23.	Khas	- Uttarpradesh
24.	Jarwas	- little Andman
25.	Gaddis	- Himachal Pradesh
26.	Chenchus	- A.P., Orissa.
27.	Bhotias	- Gashwal & Kumon
28.	Bhots	- Himachal Pradesh
29.	Baigas	- Tamilnadu (nilgiri)
30.	Chakama	- Tripura.

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32. Kol - Madhy Pradesh
33. Bhat - Himachal Pradesh

* ST Population: (in carore)
1. Madhy Pradesh - 1.22
2. Maharashtra - 0.85
3. Orissa - 0.85
4. Gujrat - 0.74
5. Rajsthan - 0.70

* SC Population
1. U.P. - 28.61 /.
2. W. Bengal - 21.04 /.
3. ~~Andhra~~ Bihar -
4. Andhra Pradesh -
5. Tamilnady -

Jackaroos - Australia

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World:
1. Pigmy food galhers - Central Africa
2. Semang - Malaysia
3. Sakais - Malaysia
4. Andmanese - India
5. Bushmen Gathering & Hunting - Kalhari desert C.S.Afr
6. Blackfoot - Rock mountain (USA)
7. Payits - NW USA
8. Eskimos / kayak Hunting & fishing - Tundra
9. Inuits - Tundra
10. Aborigin - Australia
11. Yukhagir - Saiberia
12. Bedouins - SW Asia / Arabia
13. Kirghiz - Kirgizstan (C. Asia)
14. Masai (primitive pastoral) cattle herders - East. Africa
15. Bora - south ~~Africa~~ America (Amazon)
16. Bindibus - Australia
17. Veddas - SriLanka
18. Tartas - Saiberia
19. Hausas - Nigeria
20. Kikuyas - Kenya
21. Solmans - Malaysia
22. Yorba - W. Nigeria
23. Lapps - European Tundra
24. marmons - Utah (USA)
25. samoyeds - Asiatic Tundra
26. Papuans, Hazara - New Guinea.
27. Aieta - Phillipines
28. Tapiro - Papua New Guinea
29. Tehuelche - Pantagonia.
30. Zulus - South Africa.
31. Fellanin - Saudi Arabia Egypt

LANGUAGE

INDIA

1. Indo European / Aryan (74.1.) : Rajstan - Aassam & Goa to J&K.
   Hindi, Bengali, Marathi, Gujrathi, Punjabi, Asami.
2. Dravidian (20.1.) : Telgu, Tamil, Kannada, Malyalam.
3. Sino-Tibeatean (1.1.) : Miri, Bodo, Rabha, Tripuri, Naga, manipuri.
4. Austric (1.4.1.) : Khasi & Nicobarsi, Sanjhali.

* Speakers :
- I. Hindi - 40 %.
- II. Bengali - 08 %.
- III. Telgu - 7.5 %.
- IV. Marathi - 07 %.
- V. Tamil - 06 %.
- VI. Urdu - 05 %.

WORLD:

1. Indo-European : Germanic, Italian, Iranian, Greek, Indian - Sanskrit, Bengali
2. Sino Tibetean : Chines, Japanes, Korean, Thai, & Myanmar.
3. Semito-Hematic : Arabic & Hebrew
4. African : Negro-Congo, Saharan, Khoisan, Swahil.
5. Amerindian :
6. Ural-Altic :
7. Dravidian : Tamil, Kanada, Telgu, Malyalam, Sinhali
8. Mandinago : northern Sahara.

* Speakers : I. Mandarian (Chinese) - 971 (Million)
- II. English - 481
- III. Hindi - 440
- IV. Spanish - 393
- V. Russian - 268
- VI. Arabic - 225

Mandinago - Northern Sahara.

RELIGION

World

No.	Religion	Popl^n (crore)	in %
1.	Christians	178.36	33 %.
2.	Muslims	95.07	17.1 %.
3.	Hindus	71.92	13.9 %.
4.	Budhist		6.07 %.
5.	Chinese & Japanies		3.0 %.
6.	Judaism		0.4 %.
7	Shintoism		0.1 %
8.	other		2.5 %.

India :

		Popl^n in %	State High Popl^n	state High %
1.	Hindus.	82.00 %.		Himachal Pradesh
2.	muslims	12.12 %.	U.P.	Lakshdwiv, Kerala
3.	christians	2.35 %.	Kerala	Nagaland
4.	Shikhs	2.00 %.	Punjab	Punjab
5.	Budhism	0.80 %.	maharashtra	Sikkim
6.	Jainaism	0.40 %.	maharashtra	maharashtra
7.	parsis	0.93 %.	W.MH & Gujrat	

1. Monosyllabic -
   - Wheres words are various meanings depending on their positions in the sentence.
   e.g. chinease, vietnamies, Thai, Tibetean language.
2. Agglutinative -
   - where words are altered by prefix & suffix.
   e.g. Malaya, Japanese, & many African language.
3. Inflexonal -
   - where words are flexible & can be modified to give the required meaning.
   e.g. - English, ~~fle~~ french, Indo-European language.

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Cultural Areas –

"A cultural area is a geographical area, a similler cultrual trait. e.g - language, religion etc."

Cultural Region –

"A formal & functional region within common culture".

Cultural Realm –

'A collective of cultural region sharing related culture system'.

major **Cultural Realm :**

1) Occidental Realm –
   - (i) west European - U.K. France.
   - (ii) Continental European - Greece
   - (iii) mediterranean
   - (iv) Anglo American
   - (v) Latin American
   - (vi) Australian
2) Islamic cultural Realm
3) Indian cultural Realm - Paddy culture.
4) East Asian cultural Realm.
5) South-East Asian Realm.
6) African Realm.

Cultural Hearth –

1) mesopotamia
2) Nile valley
3) Indus valley
4) Howang-Ho-valley

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1. Peublo – N. American Indians live in Arizona & mex
2. Negrillo – Aka, Bua, Twa, Bambuto.
3. Amerind is – The Indian living in America.
4. Xanthoderms – skin colour of mangolied race.
5. Polyndry – marriage of 1 men & 2-3 women.

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Animism:

'The belief that objects such as plants and stones or natural events, such as thunderstorm & earthquake have distinct spirit & conscious life is called Animism'.

1.	Founder of Political Geography	- Sir. William Petty
2.	Father of Political Geography	- Immanual Kant
3.	Father of Modern Political Geography	- Fredric Ratzel.
4.	Father of Geopolitics	- Karl Haushofer
5.	Geopolitics developed by	- Rudolf Kenjellen.

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Books

1. Politische Geography - fredric Ratzel
2. The New world - Isaih Bowman
3. Zeitschrift fur Geopolitik - Karl Houshofer
4. The Geographical Pivot of History (1904) - Mackinder
5. Democratic Ideals & Reality (1919) - mackinder
6. A Hundered years of Geography - H.W. freeman
7. The Geography of Peace - Spykman

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1. P.G. study of the political area - Alexandersson
2. Political Geog. as the study of areal diffrenciation' - Hartshorne
3. 1st university of India started P.G. - Allahbad.
4. Delimiting scope of P.G. - Hartshorne.
5. 1st global strategic view - A.T. mahan.
6. 2nd Heartland (N+S America, Africa(S. sahara), Aus, UK, Japan) - Mackinder.
7. 1st term used by 'state' - machvali
8. State - 'status' (latin) - means city or Nagar
9. Nation - 'Nasci' - means to born.
10. Nation - state : political expression of Nation.
11. frontier - social system are seprated by area or zone'

CONCEPTS

1.	Geopolitics - It' used by	- Rudolf Kenjellen
	propuunded by	- Karl Houshofer
2.	Organic state	- F. Ratzel
3.	Lebenstraturm (Living space)	- F. Ratzel
4.	mahan "Sea power"	- A.T. mahan
5.	Heartland	- Mackinder
6.	Rimland	- spykman
7.	Basin land	- Mackinder

* Boundries - line demarcated the outer limit of the state.

A] morphological classification :

a) mountain

1.	India x china - Himatay.	- Himalaya
2.	Chile x Argentina	- Andes
3.	Spain x france	- Pyrenees
4.	Peru x Equador	- Andes.

b) River.

1.	Paraguvy x Argentina	- Parana
2.	Uruguvy x Argentina	- Uruguay
3.	India x Pakistan	- Satalaj
4.	Mynmar x Thiland	- Salween
5.	Venezuela x Colambia	- Cangominoco
6.	Zaire x Cango	- Cango
7.	Zimbabwe x Botswana	- Zambize
8.	USA x canada	- Rio Grande.

c) Lake.

1.	USA x Canada	- Great lake
2.	Swizerland x Germany	- Constance
3.	Tanzahia x malwi	- Nyasa
4.	Uganda x kenya x Tanzania.	- Victoria

d) Geometrical

1.	N. Vietnam & S. Vietnam	- 17° N
2.	Egypt x Sudan	- 22° N
3.	N. Korea x S. Korea	- 38° N
4.	USA x Canada	- 49° N
5.	Canada x Alaska (USA)	- 141° W
6.	W. Irian x Papua Guinea.	- 141° E

B] Genetic classification :

1) Antecedent - Before the settlment established demarcated.
- eg - USA X Canada.

2) Super-imposed - After the settlment developed.
e.g. Korea, Germany, Vietnam.

3) Subsequent → development of the prevailing cultural pattern.
e.g. India X Pak.

4) Consequent - absence of popln & presence of barrier.
e.g - Himalaya, Pyrenees.

5) Relect - boundry currently lose their order / political function.
e.g - German X polish.

* Fedralism -
- sovergnity is constitutional divide central & state goverment.

1. Mutual intrest -
- Homogeneity in characteristics language, ethnicity.
e.g. Aus, USA.

2. Compromised - the willingness of the participating people of safegurd.
e.g - India, Nigeria.

3. Centralised - more unitary than fedral, constitution
- mor e.g - USSR, Ugoslavakiya.

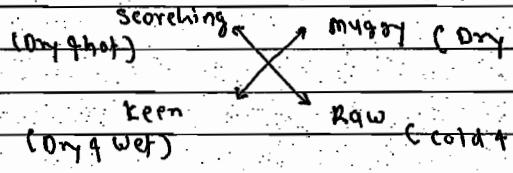
4. Imposed - majority people who were involved powerfull mionority or colonial power.
e.g - carabian islands.

5. Shape induced - shape fragmanted & prompt - forced the political leader
e.g. Pak, Malaysia.

i. Cadastral / plan map - 1:200m. Building, house, Agriculture.
ii. Topographical map - 1:50000. Natural & social elements.
iii. Wall maps - 1:1,000,00 World, Country, Tritory.
iv. Chorographical / Atlas - 1,2,5,1000

Pantograph - reduction & elarge of graph.
Pidiograph - advanced instrument of map reduction & enlage
Clinometer - To measure relief of earth surface. (High height & depth)

Climograph - 'Griffith Taylor' 'X' axis - Humidity
Y axis - Temprature.



Hythergraph : Temprature and Rainfall
Climatograph : Hartshorne & Muans climatograph'
Temprature and Rainfall.
Ergograph - Season, climate & crops.

1.	Diffusion of Inovation model -	- Hagerstand
2.	Economic Geography term 1st used	- Gvalm
3.	Resources are not they become	- Hartshorne
4.	Phantom pile	- Zimmerman.
5	Least cost Location / optimum location	- Weber
6.	maximum revenue location / market area location Theory	- Losch
7.	Agglomeration Theory	- Thombson.
8.	Transportation model	- Taffe's.
9.	Core 4 Periphesi model	- Theodore Shult
10.	Industrial symbiosis	- 9. Renner
11.	Location Triangle	- A. Weber
12.	Theory of Location interdependence	- Fetter
13	Game Theory related	- Locat^n of industr

1. Isotime - 'The line joines the equal transportation cost.'
2. Isodepane - 'The total transport cost.'
3. Distance Decay fuction - is not associated with transport system.
4. Central Place Theory - based on Baveria, southern Germany.
5. Losch model - all over Germany.
6. Harrod - Domer model - Economic Growth.
7. Fazendas - Largest estate of land in Latin America. Coffee plantation in Brazil.
8. Rebaries - House Building.
9. Density size Rule - represents relationship bet" urban size & intensity of landuse.
10. Rarities - - agriculture land belongs as resource.
11. Olöff Jonasson - Like von Thunen model but discusse zonation around industrial centre.
12. Sinclair - Intensity of landuse around an urban centre is less & increases towards county side.
13. COMECON trade - Countries of east europe.

1. Wind Energy - Mandvi
2. Geothermal Energy - Manikaran

* Crops producing countries:

1.	Tea	- India	9.	Wheat	→ china
2.	Cocoa	- Ghana	10.	Barley	→ U.S.A.
3.	Coconut	- Phillipines	11.	Rye	→ USA
4.	Banana	- Trinidad & Tobago	12.	Bananas	→ Brazil.
5.	Sugarcane Pineapple	- Hawai island	13.	Tobacco	→ China
6.	Rubber	- Malaysia	14.		
7.	Coffee	- Brazil	15.		
8.	Sugar	- Cuba	16.		

* Diseases affected by crops:

1. Monilla - Cocoa
2. Blight - Coffe
3. Rust - Wheat
4. Phylloxera - Potato

1.	Human & Economic Geography	- Leong & Morgan
2.	A Handbook of commercial Geography	- George Chisholam.
3.	Uber den standort & Industries	- Alfred weber.
4.	Regionalination of world agriculture	- Di Whittlesey
5.	Minimum temp. required for plant to grow	- 6°c.
6.	Terraced Rice farming is a speciality	- China
7.	Largest Exporters of Rice	- Thailand
8.	Pig rearing country	- China
9.	Largest goat population	- India
10.	Orchad farming & viticulture	- mediterranean region.
11.	Oriental aggriculture associated with	- Diversify economy (Rice)
12.	World 1/3 fish catch area	- NW Pacific ocean.
12.	Largest exporter of cardamom	- India
14.		
15.		

* Sector -

1) Primary (Gathering, fishing, hunting, Agri) - Red collar

2) Secondary (manufacturing, assembling, footloose ind.) - Blue collar

3) Tertiary (Trade, Transport, commu. services) - Pink collar

4) Quaternary (professional & administrative services) - White collar

5) Quinery (CLMA, scientist, actors, players) - Gold collar

6) India popln - 17.1. & energy we - 1.7 %.

7) Weber's model apply - British iorn & steel industry
India: Bokaro.

8) Foot loose Industries: watch manufacturing, Electronic manufacturing, Dying Industries, bakaries, newspaper publishing, dairy product

9) The highest centrality in lowest value - Alpha Index.

1.	Viticulture	- Grapes
2.	Mariculture	- Sea farming
3.	Truck farming	- vegetable, fruit, flowers.
4.	Factory farming	- chiken, Turkey
5.	Sericulture	- silk.

1.	The Earth summit / Rio-de-Janeiro	- Agenda 21
2.	Silicon valley of India	- Pune
3.	Transportation model	- Taffe (four phase)
4.	Harrod - Domer model	- Economic Growth.
5.	Core - Periphery model	- John Friedmann
6.	Economic Plunder	- exploitation of minerals.
7.	Social Theory	- George Henry
8.	Normative model of market system	- Richardo
9.	Social Capillarity	- Dumont
10.	Dialectic approch	- Marx
11.	Demographic Relaxation Theory	- Overpopulation.
12	Corn Belt of USA	- Beef cattle

* Order of railway network:

① Localised Linkage.
② Network Intigration.
③ Network Intensification
④ selection.

* Order of growth of ports:

① Scattered ports
② Interconnection.
③ Centralization.
④ Decentralization.

* Transport model development stages:

1. Auxiliary stage.
2. Predominent stag.
3. Symbiosis.

* Rostows stages:

① Traditional society
② Pre condition for take off
③ Take off
④ The drive to maturity
⑤ Age of mass consumption

* mobility Transition Stages: W. Zelinsky

1. Pre-modern Industrial society.
2. Early Transition society
3. Late Transition society.
4. Advanced society
5. Future superadvanced society.

Types of soil	PH value
① Agricultural soil.	8-8.5
② Extremely acidic soils	5-8
③ Neutral (soils)	7
④ Extremely alkaline soils	4-4.5

1.	Livestock Ranching	- raised for sale
2.	Mediterranean agriculture	- Orchard farming
3.	Agribusiness	- farm produce & farm services.
4.		
5.	Truck farming	- cultivation of vegetables, fruit & flowers in the periphery of cities (USA)

* Group of Practicing agriculture:

1.	Guicas	- Amazon forest	7. Kibbutz - Israil
2.	karens, meos	- Burma	8. Solkhoz - Russia
3.	Orang, Asli, Ibans	- Malaysia	9. Ujamaa - Tanzania
4.	Orang, Akit	- Sumatra	
5.	Aeta	- Philipines.	
6.	Mezzadria	- Italy	

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* Nomadic Herding:

1. fulani - west savanna
2. masai - East Africa
3. Nuba - Ethopia & Sudan
4. Banty & Hottentots - S. Africa & Botswana
5. Tuareg & Bedouri - sahara
6. Bedouins - Saudi Arabia
7. Berbers - Northern Africa
8. Tugusa - Northern Souberia

* Shifting Cultivation:

1. milpa - Central America
2. Chitene & massole - Central Africa
3. Berbeches, cammile - mexico
4. Queimada, Roca, Derubadas - Brazil
5. Ladang - malaysia
6. Pavy - malagasy
7. Kaingin - Phillipines
8. chena - srilanka
9. Humah - Java
10. Tamraj - Thibland
11. Ray - Laos
12. Taungya - Burma
13. Diuma. - Sumatra

* Land owned by group or village:

1. Kibbutz - Israel
2. Solkhoz - Russia
3. Ujamaa - Tanzania

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1. Population Geography - cleark
2. Geography of Population - Beaju-Garnier
3. A Geography of population - Treawartha.
4. A prologue to population Geography - Zeliensky
5. The Geography of life & Death. - L.D. stamp.
6. A principle of population - Malthus.
7. mobility transition model of migration - Ravenstine
8. Introduction to demographic analysis - Wansch & Termote

1.	1st Department of Geography popln study	- Punjab university Chandigarh.
2.	1st text book 'Population Geography'	- R.C. Chandana.
3.	1st doctoral work on popln Geog.	- Gosal (Trewartha)
4.	1st synchronous rencus of India	- 1871
	complete rencus	- 1882.
5.	The rencus of India 2011	- 15th
	after Independance	- 7th
6.	1st central Registration	- Dr. William Dar (1838)

* Population Distribution :-

- more developed region - 18.33%. 50-60% - ecumene
- less developed region - 81.57%. 1/3 area - non ecumene.

1) Lattitudewise

(i) N. Hemisphere - 0°-20° N - 10%. 20° to 40° N - 50%.
40-60° N - 30%, 60-90° N - < 10%.

(ii) S. Hemisphere - 0°-90° S - < 10%.

2) Altitudnal -

sea level - 200 mtr. : 66.2%.
above 200 mt. : 33.8 %. 33.8

3) Continentwise : Asia, Africa, Europe, Latin America, N. America, Oceania

* Population Density :

(i) Arithmatic = total popln / total land area

(ii) Nutritional / physiographic = Total popln / Total cultivated area — The total popln divided by foodgrain area. - Nutritional.

(iii) Agricultural = Agricultural popln / Total cultivated area

(iv) Economic = requirment of person / availablity of resources.

- 90% popln - 25% land area & 10% popln - 75% land area.
- 2.4 land area and 17.5% world popln in India.

- Popln growth rate 2.1 % per annum, for account getting doubled rate - 28 yrs.

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Population Policies :

Five Year plans –

(I) - present accurate picture of factors contributing to popⁿ increase.
- main aim to use hospitals an advice family.
- Dicover technology of family planning.

(II) - voluntary family planning, 1ST family planning clinic started.

(III) - Social climate fevour, logistic provided.

(IV) - 'The kingpins of the plan', integrated with maternal & child health care.

(V) - Tough sterilisation policy, popl^n education.

(VI) - primary health centre & subcentre setup in rural area.
- socio-economic development plan.

(IV & VII) - two child, marrage age, 60% couple contraceptive, female literacy
popl^n education

- fecundity: 'The capacity of people to bear children & thereby perpetuate themselve is called fecundity'.

- The no. of persons going to given distance is inversely proportional to to the no. of intervening opportunities'. Stouffer'

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Ravenstin Laws :

1) migration & Distance.
2) migration by stages.
3) Stream & counter stream.
4) Rural-Urban Differential.
5) Preponderence of female.
6) Technology & migration.
7) motives behind migration.

* 2001 - Urban to urban.
* India - 2011 - Rural-to Rural.

Lee's Theory of migration

	Volume of migration	Stream of migration
1)	Diversity of area	1) well defined stream
2)	Diversity of people	2) counter stream
3)	Intervening obstacles	3) Push factor
4)	Economy	4) Efficiency of migration
5)	time	5) Intervening obstacles.
6)	status of country or area.	6) economic condition.

Malthus Theory –

1) Geometric Rate - population 1, 2, 4, 8, 16....
2) Arithmatic Rate - food production 1, 2, 3, 4, 5, 6...

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Demographic Transition: 'study of popln change'.
Thomson (1929) & Notestien (1945)

1) Pre-Transition / High Stationary -
- B.R. & D.R high and fluctuating both over 35/1000.
- agrarian societies, slowly growing popln.

2) Early Transition / Early expanding -
- High B.R >35 & decline death rate 15/1000.
- health & sanitation facilities, popln explosion.

3) Late Transition / Late Expanding -
- 1st time D.R. Decline & low growth rate of popln.
- industrial society, slow popln B.R.

4) Post Transition / High Stationary -
- B.R. & D.R. approximetly equal, popln growth stable & slow.
e.g. W. Europe, E. USA, New Zealand, Russia.

* Population Resource Region:

1) USA Type - Technology - source, Popln - low, resources - high.
e.g. USA, Aus, Canada, Russia.

2) ~~Thin~~ European Type -
Technology - source, popln - high, resource - low.
e.g. NW Europe, Israel, Japan.

3) Brazilian Type -
Technology - deficient, popln - low, source - high.
e.g. Tropical Africa, Latin America.

4) Egyptian Type -
Technology - deficient, popln - high, resource - low.
e.g. India, China.

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* Fertility: 'To be birth & must not mixed with fecundity.'

i) Crude Birth Rate = $\frac{\text{no. of birth}}{\text{mid year popln}} \times 1000$, CBR = $\frac{B_1}{P} \times 1000$

ii) Fertility Ratio = $\frac{\text{no. of child} < 5 \text{ year}}{\text{female of reproductive age group}} \times 1000$, FR = $\frac{P_{0-4}}{P_{f\,15-49}} \times 1000$

iii) General Fertility Ratio = $\frac{\text{no. of birth}}{\text{women normal reproductive age}} \times 1000$, GFR = $\frac{B_1}{P_{f\,15-44}} \times 1000$

iv) Age specific Birth Rate = $\frac{\text{No. of birth to women given age}}{\text{stands for total female popln}} \times 1000$, ASBR = $\frac{B_{20-24}}{P_{f\,20-24}} \times 1000$

* Mortality: The permanent disappearence of all evidences of life at any time after birth taken place.

i) Crude Death Rate = $\frac{\text{no. of Death}}{\text{mid year popln}} \times 1000$, CDR = $\frac{D}{P} \times 1000$

ii) Mortality by age & sex = $\frac{\text{no. of death specific age \& sex}}{\text{Total popln of specific age \& sex}} \times 1000$ DaS = $\frac{D_{as}}{P_{as}} \times 1000$.

iii) Infant mortality Rate = $\frac{\text{no. of death child} < 1 \text{ year}}{\text{no. of leave birth}} \times 1000$ IMR = $\frac{D_0}{B_1} \times 1000$

iv) Maternal mortality Rate = $\frac{\text{no. of female death during maternity time}}{\text{live birth.}} \times 10,000$

Mizoram (5.1) lowest mortality & Orissa, Up (9.1) highest mortality

$M = \frac{O - A}{O}$ where, m = maladjustment
a = actual popl^n
o = optimum popl^n.

$M = \frac{\text{optimum popl}^n - \text{actual popl}^n}{\text{optimum popl}^n}$

1.	Most popl^n island in world	- Java
2.	Demographic Relaxation Theory	- overpopulation
3.	Optimum population	- m = O-A/O
4.	Wi mobility Transition model	- Wilbur Zelinsky

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December 2008

1. Airmass Type
   i. Arctic Airmass - AA
   ii. Antartic Airmass - E
   iii. Equatorial Airmass - T
   iv. Tropical Airmass - A

2. Soil water Budget - Thornwait.

3. 1st was adopted philosophical view of Geography - Immanual Kant.

4. Tribe India
   i. mikir - Meghalaya
   ii. Korwa - ~~Meghalaya~~ Chhattisgarh.
   iii. Thary - Uttarakhand
   iv. Anog - Andamang nicobar

5. Agricultural efficency - Enayat Ahmad.

6. sequent occupance - Richard Hartshorne

7. Counter Magnet - National capital Region plan

8. Remote sensing different resolution characters -
   Temporal - spectral - Radiometric - spatial.

9. Regresion analysis - Francis Galton.

Positivism :

Founder - ~~Imm~~ August Comte

Period - 1920 - 1930

work/Hisry - British: John~~Locke~~ Locke and Hume.

Logical positivism: Vienna circle by Moritz Schlick.

- positivism is empirism opposite to idealism.

Behavioralism : Behaviouriln apporch 'Carl-o-saur'

Coined - Simon

propounded - W.Kirk

period - 1960 - 1970

Hisbory - Johan's, Grabirial Granno, Edgar Kant, Pread & walport

- ackon's are mediated by cognetive process.

Radacalism :

coined - Karl vitto{oje} (1920)

propounded - R.J. Peet (1977)

period - 1970-80.

work - ① Vietnam war ② civil right (American Black)

③ poverty & inequality suffered by urban 'ghetto'.

- The consideration of social value is core of Radi.

Humanism :

coined - Kirk (1950)

propounded - Yi-fu-Phuan (1977)

period - 1970-80 'Development & quality of life'

- Human awareness & creativity

- mental map, crowding & privacy.

1.	Social Darwinism	- Herbert Spencer
2.	Circumference of the Earth	- M.M. Fennerman.
3.	Enviormental Determinism	- Ellsworth Huntington.
4.	Areal Differenciation coined	- Carl-O-Sauer (1925)
	popularised	- Richard Hartshorne
	in - Nature of Geography (1939)	
5.	Areal variation / Spatial variation	- Alfred Hettner
6.	chorological concept	- Richthofen.
7.	Human welfare	- David Harvey
8.	method of Regional science	- Walter Isard
9.	Social justice & the city	- David Harvey
10.	Natural Region	- Vidal de-la Blach.

December 2009

1.	Highest migration in 2001 census.	- Urban - Urban
2.	Projection in Loxodromes	- Gnomonic
3.	Regional disparities in development	- IInd Five Years plan.
4.	classification of states.	- Van Valkenburg.

June 2010

1.	Temprature measured on kelvin scale is	- Ratio scale
2.	Geo-synchronous satellite	- IRS
3.	India's highest divasting earthquake	- Bihar 1934
4	Largest physiographical division of India	- Great N. plain
5.	Uranium (metamorphic & igneous rock)	- Kerala.
6.	Taffe Transport model (route based on -)	- Kenya & Nigeria.
7.	Agricultural system 'child of Industrial Revolution'	- Intensive subsistance village
8.	Julian Wolpart	- Decision making model
9.	W.W. Leontieff	- Input-output model.
10.	UN projection Maximum global urban popl^n 2030!	- South Asia.
11.	Christian Topography	- Hiramanus
12.	Solinus	- Rerum memorabilum.
13.	Urban geography - Arthur Robinson	- Settlement Geography
14	Settlement Geography - ~~Settlement Geography~~ mark Jefferson	- Cartography
15.	physical Geography - Humboldt	- Hum
16.	Cartography - Robert Dickinson	
17.	chemical weathering rusting of iorn	- oxidation

18. Red Sea - Rift valley
19. Polyclimax - Clement
20. Unity in multiplicity - Carl Ritter.
21. Davis cycle developed area - ~~Missouri~~ Missouri
22. Kant viewed Geography - Chorological science.

Dec. 2010

1. Harmonic mean is used to measure - Growth rate.
2. A Handbook of commercial Geography' & translator - George Chisholm(1889)
3. National water Policy ~~200~~ (NWP) - 2002
4. Temperature & Relative Humidity - Climograph
5. Temperature & Rainfall - Hythergraph.
6. India's popⁿ to world (2001) - 16.7%
7. 'Principle of Least Effort' relation to migration - Jiff
8. Rating curve - Stream velocity.
9. Sublimation - Vapour to solid.
10. 1st geographer acertain of length of equator - Eratosthenes.
11. Bay of Bengal 1st plot - Ptolemy
12. 'Modern Geographical Thought' - Richard Peet.
13. Erdteile - Richthofen.
16. Ischrone map - Equal transport cost
17. Isoneph map - Equal cloudiness.
18. Isotim map - Equal time.
19. Isophene map - Equal biological event.

2012 JUNE

paper III

1. Platesnoster lake - Lake formed on glacial stairways.
2. Selva forest - Broad leaf evergreen forest.
3. Schaefer favour of - scientific generalization.
4. logical positivism - Behaviouralism.
5. William Bunge - Theoratical Geography.
6. David smith - Human Geography: A welfare approch.
7. Richard Peet - modern Geographical Thought.
8. Arab scholar correlate - to Ptolemy book: Al-Idrisi.
9. mental map - Gould & white.
10. 2nd Demographic Transition - Van de kaa.
12. occupation of Gonds - cultivation.
13. Export based model - North
14. Voluntry sterilization popⁿ policy - IInd five year plan.
15. Lorenz curve - show unequality in distribution.
16. Kettle - Deep dipession along morain belt.
17. Tarn - small mountain lake occupying a cirque.
18. Eskers - glacio-alluvial ridge.

Paper II

1. world's topography
2. Air pressure measure - Hectapascal.
3. ferrel cell - westerlies
4. Hadly cell - easterlies.
5. Ablation - mechanism of energy transfer.
6. Neolithic period - Domestic of plant & animals.
7. Peter Haggett - Geography: A modern synthesis
8. P.E. James - All possible worlds.
9. Abler, Adams, Gould - spatial organisation.
10. Barrow - Geography as human ecology.
11. largest popⁿ cell city - Delhi

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12. Range of good - The maximum distance which people have to travel to purches a good & services.
13. crop indensity - $\frac{\text{Gross cultivated area}}{\text{Net sown area}}$.
14. Gunar myrdal - cumulative causation model
15. Friedman - core-periphen model.
16. Frank - Dependency model.
17. Friedman - relationship bet^n spatial organisation & national development.
18. Histogram - showing frequency distribution.

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Five Year Plans:

I Agricultural plans (1951-56) - Damodar, Bhakra-nangal, Kosi, Hirakud project. Sindri fertilizers & chittaranjan antibiotic.

II Industrial plans (1956-60) - Bhilai, Rourkela, Durgapur, BHEL, Nangal & Rourkela heavy fertilizers. Regional disparities in development.

III Agriculture & Industrial plans (1961-66) - food corporation of India.

* Holidays plans - (1966-69) Green revolution - Norman Borlog, M.S. Swaminathan

IV Stable economic Growth (1969-74) - DPAP, SFDA, Bokaro steel plant; steel authority of India.

V Poverty alleviate & Independable (1974-78) - TRYSEM peasant development program.

* Rolling plan (1978-80) - Gunnar mirdal, - District industrial centre.

VI Poverty alleviation & employment create. (1980-85) - IRDP, NREP, DWCRA Vishakhapatnam & salem steel plant.

VII Employment creation founder plans (1985-90) - MWS, CAPART, JRY, NRY

* Years plans - (1990-92) - ગામડે ગામડે, ઘરે ઘરે.

VIII Human Development plans (1992-97) - SJSRA, EAS, PMRY, MPLADS, mid day meal, Ganga kalyan scheme.

IX.	Social & Economical	- Kasturba Gandhi, Pradhanmantri Gram sudak plan.
	Balanep growth plans (1997-2002)	Sarve sikshya abhiyan.
X.	Education plan (2002-07)	- National agricultural policy, Rural employment plan Bharat Nirman yojyna.
XI.	Social service plans (2007-12)	- Literacy, sex-ratio, Birth rate, Death rate. forest cover; clean river are target. - social & economic infrastructure.

Regional Planning in India:

Phase	Period	Major changes.
I	1950-60	- Community development program.
II	1960-70	- Panchayat raj phase.
III	1970-80	- Block level planning.
IV	1980-90	- District level planning.
V	1990-2001	- Renaissance of Panchayat Raj phase.
VI	2001-2010	- Rural development & Rural planning.

1.	Founder of Regional Planning: Buntan & manky	
2.	Book - New Exploration 'A philosophy of regional planning'.	
3.	Growth Pole model	- F. Perrox
4.	Regional Planning - equval word	- TVA (Tennery valley auth.)
5.	Regional Geographer	- Bernard Veniious
6.	Propulsive Industries	- Bourdon villes
7.	Polarization & Trickle down effect	- Albert Hirschman's
8.	Metropolis - satellite model	- Gunder franks
9.	Anti growth pole strategi	- Richardson's
10.	circular & cummulative causation model	- Gunar myrdal's
11.	Centre - periphery models	- J.R. friedmans
12.	Renniance period written by word Geography	- Bluverius
13.	Delimit Agricultural region	- Nestayan.
14.	Pivotal Development	- Parox
15.	Cumulative result theory	- myrdal
16.	Resource cycle	- I.B. Komar
17.	Production cycle.	- Kolovansky
18.	Joint Growth theory	- B.J.L. Berry
19.	The word 'compage' used	- Whittlesy
20.		

1. crop insurance planning – 1982
2. All industrial company act passed – 1935
3. P. Sengupta India divided – 4 part
4. Rural development 'Block level' program – 1981
5. Planning region prapared in India – Prof. Jewel.
6. Regional planning started in India – 1961
7. India planning prepared – state level
8. Program of women & children – DWCRA
9. IRDP (India Rural Development Program) – 1975
10. Planning Region of India P. Sengupta, Galina Saddasyuk – 7 macro, 42 medium.
11. R.P. Mishra, Sundram, B.L. Prakashrao – 19 micro, 35 medium.
12. Agricultural climatic region of India – 15
13. Statistical based Agricultural region – P. Sengupta
14. Normalization method / standardization – Prof. Kundu
15. Ranking method – A.B. Mitra
16. Delineted India into micro, meso & macro – R.L. Singh
17. C.S. Chandrashekhara India divided in to – 13 macro, 35 micro.

* Koppen's classification - (1933)
Based on - vegetation zones
modified in - Geigger Pohi 'Koppen-Geigger Pohi scheme'
A: Tropical Rainy climate
B: Dry climate
C: middle latitude rainy climate with mild winter
D: middle latitude rainy climate with cool winter
E: Polar climate.
* 5 major & 11 sub types -
A: Tropical Rainy climate - no winter season. (megatherm)
Af - Equatorial rainforest climate
Aw - Tropical savanna climate
Am - Tropical monsoon climate.
As - Dry summer e.g. Tamilnadu.
B: Dry climate - (Xerophytic)
BW - Dry Desert climate
BS - Semi Arid steppi climate.
C: Warm temprate rainy climate - (mesotherm)
Cf - European type climate
Cw - China type climate.
Cfa/Caf - USA type climate
Cs - mediteranean climate
D: Humid cold climate ; (microthermal)
Df - Humid cold climate no dry season.
Dw - Humid cold climate, dry winter
E: Polar climate (Heisthothermal)
ET - Tundra climate
EF - Polar Icecap climate.

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* Thornwaite classification - 1931 N. America.

1] 1931 Classification :

— like Koppen natural vegetation base -

(i) Pricipitation Effectiveness -

A -	Wet Rainforest	>127
B -	Humid forest	64-127
C -	Subhumid Grassland	32-63
D -	semiarid steppe	16-31
E -	Desert Arid	<16

(ii) Temprature effectiveness -

A' -	Tropical	127
B' -	mesothermal	64-127
C' -	microthermal	32-63
D' -	Taiga	16-31
E' -	Tundra	1-15
F' -	frost	0

2) 1948 classification -

- Based Potential Evapotranspiration

(i) moist climate -

r	- little or no water deficiet	- 0-10
S	- Moderate summer deficiet	10-20
w	- moderate winter deficiet	10-20
S_2	- large summer deficiet	>20
w_2	- large winter deficiet	>20

(ii) Dry climate

d	little or no water surplus	- 0-16.7
s	moderate surplus	16.7 - 33.3
w	~~large winter~~ moderate surplus	16.7 - 33.3
s_2	large winter surplus	< 33.3
w_2	large summer surplus	< 33.3

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	INSTRUMENT	
1.	Raingauge	- Pricipitation
2.	Barometer	- Pressure
3.	Hygrometer	- Relative Humidity
4.	Wind vane	- Wind Direction
5.	Anemometer	- wind speed
6.	Altimeter	- Altitude
7.	Evaporimeter	- Rate of evaporation
8.	Hydrometer	- specific gravity of liquid
9.	Hypsometer	- absolute height above sea level
10.	Solarimeter	- Intensity of solar radiation.
11.	Barograph	- Recording of atmospheric pressure.
12.	Cathetometer	- Height.
13.	Pyrometer	- very high temp.
14.	Cryometer	- very low temp.
15.	fathometer	- ocean depth
16.	Manometer	- Pressure of gases
17.	Photometer	- luminous intinsity of the source of light.
18.	Radio micrometer	- Heat radiation
19.	Salinometer	- Salinity of solutions.
20.	Atmometer	- Rate of evaporation.
21.	Actinometer	- Solar radiation
22.	Nephoscope	- Height, movment & velocity of clouds
23.	Lysimeter	- Actual evapotranspiration.
24.	Psychometer	- Relative Humidity
25.	Pyranometer	- scattered radiation on a surface.
26.	Thermostat	- Regulates temp. to a particular point.
27.	wind wane	- indicates wind direction.
28.	wind rose	- wind blow from various points.
29.		
30.		

Planimeter	- calculation areas on a map.
Pantograph	- enlargement & reduction of a graph. map.
Rotameter, Opisometer	- measuring distance on a map.
Clinometer	- measures angles & slopes on ground.
Parallax bar	- measures elevation of photo graph.
Theodolite	- measure horizontal & vertical angle.

ISOPLETH

1.	Isallobax	- change in atmospheric pressure.
2.	Isobath	- Depth below the surface of an ocean.
3.	Isobathytherm	- Temp. at a given depth.
4.	Isobar	- Atmospheric pressure.
5.	Isotherem	- mean summer temprature
6.	Isocheim	- mean winter temprature.
7.	Isogeotherm	- Temp. of earths interior
8.	Isotach	- wind speed
9.	Isohel	- sunshine duration.
10.	Isohyte	- Rainfall amount.
11.	Isohypse	- Height above sea level.
12.	Isoneph	- Degree of cloudiness
13.	Isonif	- Amount of snowfall equal snow depth.
14	Isoryme	- frost intensity
15.	Isohaline	- salinity
16.	Isotherm	- Temprature
17.	Isoseismal line	- Intensity of shock from an earthquake.
18.	Isothermobath	- Sea water temp. at given depth.
19.	Isobront	- Thunderstorm at the same depth.
20.	Homoseismal line	- Affected at the same time by an earthquake shock.
21.	Isochrone	- equal time
22.	Isonoph	- equal cloudiness
23.	Isotime	- equal transport cost.
24.	Isophene	- equal biological event.
25.	Isorithmic	- Population Distribution.
26.	Isodopane	- Total trasport cost
27.	Isotropes	- potential temprature.
28.	Isopaches	- Cumulonimbouse
29.	Isohypses	- cloud base
30		

31.	Isomer	- same mean monthly rainfall.
32.	Isothyme	- Equal frost intensity.
33.	Isogyenic	- same density of meteorological chart.
34.	Isokinetic	- Equal degree of wind velocity.

	~~front~~	
1.	~~Anticyclone~~ Front	- V.J. Bjerknes, Solberg, T. Bergeron
2.	Anticyclone	- Galton
3.	cloud instability Theory	- Tor Bergeron.
4.	collision Theory	- Longmuir.
5.	World six rainfall zone	- Haurwitz & Austin
6.	World 15 rainfall zone	- Patterson.
7.	Dynamic monsoon	- Sir Edmund Halley
8.	Thermal monsoon	- H. Flohn.
9.	Jet monsoon	- M.Y. Yin
10.	Tropical cell	- Hadley (N-S)
11.	Walker cell	- east west

1.	Ozone Layer	- 20-40 km.
2.	Ionosphere	- 80 - 300 km.
3.	Heterosphere	- O_2, H_2, N_2,
4.	Albedo	- 35%
5.	Cloud Albedo	- 27%
6.	Earth Absorb	- 51%
7.	Temprate Cyclone	- 30°-50° N&S. latitude.
8.	Identify Six rainfall region	- Haurwitz & Austin
9.	Globe divide into 15 rainfall zones	- Patterson

Katabatic winds - mountain breez
Anabatic winds - valley breez.

1	Cyclone		- India
2	Typhoon		- China
3	Hurricanes		- Caribean sea
4	Willy-Willy		- Australia
5	Tornadoes		- U.S.A.
6	Baguio		- Phillipines
7	Taify		- Japan
8	Big wind & Tiaphong		- East Pacific
1	Fohn	warm	- Alps
2	Chinook / snow eater	"	- Rockies
3	Kalbaisakhi		- N. India
4	Berg	"	- S. Africa
5	Zonda	"	- Andes (Argentina)
6	Loo	"	- Indian subcontinent
7	Santa-Ana	"	- S. California
8	Kashmin ~~Harmattan~~	"	- Egypt
9	Samun	"	- Iran
10	Harmattan / Doctor	"	- Guiena coast -
11	Yamo	"	- Japan
12	Tarmantto	"	- Central Europe
13	Bricktielday	"	- Australia (vichorsa)
14	Brickrollers	"	- Great plain USA -
15	Shamal	"	- mesopotemia & Persian Gulf.
16	Sircco	"	- mediterranean sea
17	Gibli	"	- Libiya.
18	Chili	"	- Tunesia.
19	Harmattan	warm dry	Western Sahara.
20	Norwester	"	- Newzeland.
21.	Simoons	"	- Sudan
22.	Friagem	"	- southern, Brazil.

1	mistral	cold	- SE France
2	Purga	"	- Russian Tundra
3	Leventer		- France / southern ~~France~~ spain.
4	pampero		- South America.
5	Karabyran		- Gobi, N. china, Tarim basin.
6	Katabatic		- Antartic & Greenland
7	Bora		- Adreatic sea
8	Blizzard		- N. USA
9	Byrran		- Saiberia
1.	Northers		- U.S.A.
2.	Nevadose		- Andes.
3.	Dust Devil		- Sahara
4.	Habub		- Sahara
5.	Simco		- Saudi Arabia.
6.	The Busters		Tasmania, Aus.

clouds :

17) High clouds - (6-12km)

(i) Cirrus clouds (Ci) - hair like, transperent.

(ii) Cirro-Cumulus clouds (Cc) - small globules / flakes.

(iii) Cirro-stratus clouds (Cs) - milky thin sheet, moon visible. Halo phenomena

2) High clouds (3-8)km :

(iv) Alto-stratus clouds (As) - Gray or blue sheet - moon obscured. Dense & grayish.

(v) Alto-cumulus clouds (Ac) - wool pack, rumpy arranged in layers.

(vi) Nimbo-stratus clouds (Ns) - rainstorm, complete darkness.

3) Low clouds (2-5 km)

(vii) strato-cumulus (Sc) - globulary / rolls.

(viii) Stratus clouds (St) - Fog like cloud

(ix) Cumulus clouds (Cu) - dome shaped, flat bases, thunder

(x) Cumulo Nimbus clouds (Cb) - thunder storm, anvil shape, vigra. Heavy downpour.

1.	cloud classification based on	shape & Height.
2.	Imp. condition necessary for cloud	- condensation nuclei.
3.	1st person to classified cloud	- Baptiste Lamarck.
4.	Total moisture loss of atmosphere	- Evapo - Transpiration.
5.	warm air moves cooler surface.	- Advectional fog.
6.	cold air flows much warmer water	- steam fog
7.	Cumulonimbus cloud develop downward	- mamma.
8.	Rotors develop towards	- leewards of mountain.
9.	Relative Humidity measured	- wet & dry bulb thermometer.
10.	Temp. at which a sample of air becomes saturated	- Dew point.
11.	Rugged & torn nature of cloud	- Fractus cloud.
12.	maximum extension of the driest condition near	- Peru.
13.	world highest recorded rainfall intensity 24hr.	- Reunion Islands
14.	a place without rainfall for longest period is	- Iquique (chile)
15.	Greatest no. of days/yrs with precipitation	- Bahia felix (chile)

1.	Stability	- el is lesser than dra
2.	Absolute stability	- el is greater than ma
3.	Instability	- el is greater than dra
4.	mechanical instability	- el is very high.
5.	conditional instability	- el is lesser than dra & greater than ma.
6.	Neutral equilibrium	- el = dra.
7.	Boundry bet^ mesosphere & Ionosphere	- Homosphere & Bet Exosphere.
8.	Hetrosphere top to bottom	- H_2 → He → O_2 → N_2
9.	Hydrogen layer	- 3500 Km.
10.	Troposphere	- 75% of total gaseous.
11.	Ozone is produced in the	- chemosphere.
12.	Van Allen Radiation	- electrically charged particles.
13.	Best ionic layer reflect radiowaves	- E-layer.
14.	Energy recived by the earth	- 2gm calorie / cm^2 / min
15.	Visible surface of Sun	- Photosphere.
16	Cool spot - Sun spots & Hot spots - faculae	
17.		

1.	Pressure at sea level	- 1013.25 mb
2.	Highest sea level pressure	- 1075.20 mb (Tokyotask)
3.	Lowest sea level pressure	- 877 mb (mariana.
4.	Air pressure dicresses rate	- 0.1 inch / 3.4 mb per 600ft
	Pressure Belt -	
1.	Equatorial low Pressure Belt	- 5°N & 5°S
2.	Sub-Tropical High Pressure Belt	- 25° - 35° both Hemisphere.
3.	Sub-Polar Low Pressure Belt	- 60° - 60°
4.	Polar-High Pressure Belt	- Polar 90°
	Planetary Wind -	
1.	Polar Easterlies	
2.	Westerlies — roaring fourties	- 40° - 50°s lat.
3.	NE trade winds — furious fifties	- 50°s lat.
4.	SE trade winds — shrinking sixties	- 60°s lat.
5.	westerlies	
6.	polar easterlies	

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Tempera te cyclone Theories -

1.	Convergence of two opposing air masses	- Fitzroy (1863)
2.	Dynamic theory of cyclogenesis	- Shaw & Lampfert (1891)
3.	formulation Theory of cyclogenesis	- Abercrumby (1887)
4.	Polai front Theory	- V. Bejerkens & J. Bjerkens
5.	Cyclone development of middle latitude.	- Barcoline
6.	formulation at eddies	- eddy

- 15° longitude by 1 hr. passes

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1.	Sun temperature	Surface - 6000°c, centre - 5500°c.
2.	Sun Density	- 1.41
3.	Earth Density	- 5.5
4.	moon Density	- 3.3
5.	Perihelion (3 June)	- 147 ml. km.
6.	Aphelion (4 July)	- 152 ml. km.
7.	Apoge	+ 407,000 km
8.	Perige	- 356000 km.
9.	International date line	- 180° meridian.
10.	1 Hour } to sun	- 15° lat passes
11.	4 min. }	- 1° lat pass

Composition of earth	%
N_2	78.08
O_2	20.94
Ar	0.93
CO_2	0.03
H_2	0.0018
He	0.0005
O_3	0.00006
N_2	0.00005
CH_2	0.00001
Kr	0.000005
Xe	0.000005

Water vapours - 0 - 5%

90% in 5 km

1. A not a green house gas - methane
2. Formation of sedimentry rock - Nitrogen
3. Hygroscopic particles - sea salt

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Structure of Atmosphere:

a] Homosphere:

1)	Troposphere	- Eg. 16 & pole - 6
	Tropopuse	- Eg. 17 & pole. 9-10
2)	stratosphere (Nacreous clouds & mother of pearl)	- 17-50
	Stratopause	- 50-55
3)	mesosphere - Noctilucent clouds	- 50-80 - Aurorous
	mesopause	- 85-90
4)	Thermosphere	- 90+

b] Heterosphere:

1)	Inosphere	D-Layers	- 90-99
		E-Layers (Kennely Heavyside)	- 100-149 - Kennely Heavyside
		F-Layers	- 150-380 - Appleton layer
2)	Exosphere	H_2-Layer	90-200
		O_2-Layers	200-1100
		He-Layers	1100-3500
		H_2-Layers	<3500

1.	Reflects radio waves	- Inosphere
2.	Homosphere courresponds with	- mesosphere.
3.	Teposphere contains total gases	- 75%.
4.	Belts of ionised particles	- Van Allen Radiation
5.	Kennely-Heavyside layer	- E Layer
6.	Appleton Layer	- F Layer
7.	free electron produced	- G Layer

1.	Solar radiation reflected	- 35%.
2.	Solar radiation travel	- 300,000 km/sec.
3.	visible surface of the sun	- Photosphere.
4.	Evaporation measure	- Lysimeter
5.	Thermal efficiency index	- Trewarth-a
6.	The opposite of 'Adret' is	- Ubac
7.	Highest official air temperature	- Al-Aziza (Libiya)
8.	Highest mean annual temp.	- Lugh (Somalia)
9.	Highest specific Heat	- water
10.	Highest range of temperature	- Verkoyansk
11.	maximum temp recorded	- 2-3 pm (after mid day)
12.	minimum temp recorded	- 4-5 am (before sunrise morning)
13.	Hottest month in N. Hemisphere.	- July
14.	Altimeter instrument measure	- Height above sea level.
15.	Fahrenheit into centigrade	- 1.8 X °C + 32°F
16.	Lowest pressure recorded on earth.	- 760 mb.
17.	Lines join equal baromatric tendency	- Isallobar
18.	Normal sea level pressure is	- 1013.25 mb
19.	Coralis force at equtor	- Nil
20.	meandring path of geostrophic wind	- Rossby wave
21.	Balance bet^n coriolis & centrifugal force	- Gradient wind
22.	Thermally direct cell	- Hadley cell.
23.	wave motion of upper westerlies	- Inden cycle.
24.	Tropical cyclone originate only	- over ocean
25.	centre cold air surrounded by high temp.	- cold pool
26.	cyclonic circulation is initiated	- cyclogenesis
27.	weakning of cyclonic air circulation	- frontolysis
28.	Driest dessert of world	- Atacama
29.	ranfall calculated as =	Total rainfall in mm / no. of rainfall hours
30.		

Solar constant (सौर स्थिरांक) : पृथ्वीवर दर चौ. कि.मी. क्षेत्रावर पडणारे सूर्यकिरणांचे 2 कॅलरी इतके प्रमाण म्हणजे सौर स्थिरांक.

1. Summer Solastice - 21 June
2. Winter Solastice - 22 Dec
3. Vernal Equinox - 22 March
4. Autonomal Equinox - 23 Sept

1 Nacreous clouds - Tstratosphere
2 Noctilucent clouds - mesosphere
3 Auroras - Erosphere
4 Air Glows - Chemosphere

1. Ice crystals containing a tiny solid nucleus of 1 micrometer - freezing nuclei
2. warm front slope less than 1:100
3. Small very intense cyclone - Tornadoes
4. Uruguay & Argentina wind - Zonda
5. rainfall of tropical cyclones - spiral bands
6. Semi permanant in existance - migratory cyclones
7. Relatively hot land - Insolation cyclones
8. Eye of cyclone - Blue sky.
9. permafrost region - saiberia
10. Koppens classificat^n based on - Temp. & rainfall
11. monsoon climate. - 5°-30° latitudes
12. spatial limit of continental climate - Groatynsky
13. mediterean type climate. - Hobart
14. 10°-30° lat. western margin of continent - sudan type
15. seasonal contrasts are maximum in - mid latitudes
    High range of temp. in steppe climate - Contanentality.

Air Glow :

-Reactions bet^ atoms & molecules of O_2, N_2, H_2 & sodium that have been excited by solar radiation.

- Air glow formed in chemosphere.

Atmospheric windows:

The atmospheric gases absorb much of the terrestrial radiation except with wavelength of bet^ 8.5 to 14 micron is know as atmospheric windows'.

Tephigram :

'The diagram used by meteorologist to depict changing properties of moving air parcels, such as at various isobaric levels in the atmosphere is Tephigram'.

Gyre :

'The circulation of surface water in closed circulatory system around the sub-tropical high pressure system is called Gyre'.

1. Pacific ocean -

Kuroshio (W)	- philippines coast
Oyashio / Kurile (C)	- Bering strait Arctic - pacific.
Okhotask (C)	
Alaskan (W)	
California (C)	
East Australian (W)	
Peruvian / Humboldt (C)	
El Nino (W)	- Peruvian coast N-S.
La Nina (W)	
Tsushima (W)	

2. Atlantic Ocean -

Antiles (W)	- east coast of west Indies
Florida (W)	- Gulf of mexico
N. Atlantic Drift (W)	
Gulf stream (W)	- Cold wall
Labrador (C)	- Baffin Bay & Davis strait
Canaries (C)	
Brazil (W)	
Falkland (C)	- S. of Brazil
Benguly (C)	- S-N
Carribean (W)	- Gulf of mexico
Canary (C)	- w. coast of N. ~~America~~ Africa, Mederia & cape varde.

3. Indian Ocean -

NE monsoon (W)	- land to ocean during winter
SW monsoon (W)	- ocen to land during summer.
S. Equatorial current (W)	- ~~During winter~~ all season present.
Counter current (W)	- during winter only
Agulahas (W)	- east of Madagascar

West wind Drift (c)

Australian current (e)

1.	convergence of oceanic current	- equatorial region.
2.	Equatorial current caused by	- coriolis force.
3.	Open ocean tide difference High & Low	- 0.5 mtr.
4.	Spring tide more than normal tide	- 20%.
5.	Neap tide lower than normal tide	- 20%.
6.	Tides occur regular interval	- 12 hr. 26 min.
7.	Highest tidal amplitude & range (world)	- Bay of fundy
8.	Highest tide recorded in India	- Okha (Gujrat)
9.	Generall tide occurs	- twice a day.
10.	Southampton southern coast of England.	- 4 times day
11.	Ist tidal power plant	- Rance (France)
12.	Thermometer record temp. upto accurate	- ± 0.02 °C
13.	Temp. range recorded	- 2 p.m. & 5 AM.
14.		
15.	Daily range of temp. surface water	- 1°c
	low latitude	- 0.3°c
	High latitude	- 0.2° - 0.3°c.
16.	Equator to 60° temp. increases & after decrease	- global range.
17.	river waters sodium chloride	- 2%.
18.	major salt (NaCl) source of ocean water	- continent.
19.	No definate trend of salinity (increase & decrease)	- vertical distribut^{n}
14.	Density of seawater range	- 1.027 to 1.028
15.	Surface water low & ~~high latitude~~ bottom high density	- at equator
16.	Surface water High & ~~high low~~ bottom of low density	- at high latitude.
17.	Rainforest of the ocean	- corals
18.	Largest Atoll	- kwajalien (marshal isc)
19.	Largest coral bleaching account 70%	- 1998

mperature :

Avarage annual temp. all ocean	- 17.2°C
N. Hemisphere	- 19.4°C
S. Hemisphere	- 16.1°C
Pacific	- 19.10°C
Indian	- 17.00°C
Atlantic	- 16.91°C
Avarage temp. of surface waters	- 26.7°C

linity :

Avrage salinity of sea waters	- 35 ‰
Atlantic ocean	- 35.67 ‰
Caribian ocean	- 34.85 ‰
Pacific ocean	- 35 ‰
maximum salinity occurs betⁿ	- 20°-40°N & 10°-30°S
Highest salinity	- Lake van (330 ‰)

Lake van - 330 ‰
~~Red sea~~ ~~330 ‰~~
Dead sea - 238 ‰
Great salt lake - 220 ‰

1. Apogee - farthest moon & earth (407,000 km)
2. Perigee - nearest moon & earth (356000 km)
3. Syzygy - sun - moon - earth straight line.
4. Quadrature - sun - moon - earth right angle.
5. Conjuction - sun & moon one side of earth (solar eclips)
6. Opposition - Earth position betⁿ sun & moon (Lunar eclips)

1.	1st person idea of deposits	- Herodolus
2.	Detail information of ocean deposits	- John Murry
3.	organic deposits	- ooze
4.	Vertical distribution of deposits	- F.J. Mankhouse
5.	Submarine canyon similies to youthfull to river valley	- sheppard

THEORIES

Tides -

1.	Equilibrium Theory (1687)	- Issac Newton
2.	Dynamic Theory (1755)	- Laplace
3.	Progresive Wave Theory (1833)	- William whewell
4.	Canal Theory (1842)	- G.B. Airy
5.	Stationary Wave Theory	- B.A. Harris

Glacial -

1.	Subsidence Theory (1842)	- Darwin & Davis (1918)
2.	Stand still Theory (1880)	- Murray
3.	Glacial control Theory (1915)	- Daly
4	Coral Bleaching	- Alfred Mayer

Origin of Earth

1.	Gaseous Hypothesis (1755)	- Kant
2.	Nebular Hypothesis (1904) 1796	- Laplace
3.	Planetesmal Hypothesis (1906)	- Chemberlin & Moulton
4.	Tidal Hypothesis (1919) modify - 1929 Jeffery Callain type	- James Jeans Jeffery
5.	Binary star Hypothesis 1952	- Russell
6.	Supernova Hypothesis 1946	- Hoyel & Littleon
7.	Inter stelles dust Hypothesis 1943	- Otto schimidt
8.	Big Bang Theory 1972	- Lamentere
9.	Capoheid Theory	- Banerjee.
10	Protoplanet	- Von Wizsacker
11	Collision Hypothesis	- Jefferey's

1.	avarage ocean depth	-3800 mts.
2.	lithosphere & Hydrosphere represent	-Hypsometric curve.
3.	continental shelf	- 8.6 %.
4.	continental slope	- 8.5 %.
5.	Abysal plane	-75.9%
6.	Earths revolving speed	- 18.5 km/sec.
7.	Earths equatorial diameter.	- 7927 mile
8.	Earth sun distance	- 930 1944 mile.
9.	Binary star of a black hole	- Cygnus-X.
10		

Deposits classification :

a) Terrigeneous -

1. Graval - Boulder (256 mm), cobble (64), Pebble (4mm), Granual 2mm.
2. Sand - 1/16 mm.
3. silt, clay, mud - f
   - (i) silt - 1/16 mm 1/92 mm
   - (ii) clay - 1/256 mm
   - (iii) mud - 1/8192 mm. (a) Blue - iorn sulphide & organic element.
     (b) Red - iorn oxide
     (c) Green - potarium & glyconite.

b) Pelagic.

(i) Organic - flora & fauna
- animal skeleton, plant leaves & shell.

(ii) Calcareous: lime

(a) Peteropad - calcium carbonate - tropical areas (coral region)

(b) Globigerina - coral region - calcium, silica, tropical & temprate.

(iii) Siliceous - maximum amount of marine deposite "silica content"

(a) Radiolarian - foraminfera.

(b) Diatom - microscopic plant.

(iv) Inorganic -

Dolomite, phosphate, silica, maganese.

(i) Red clay -

(ii) meteoric Dust -

maximum deposits :

pacific ocean	- Red clay (70-3%)
Indian ocean	- Globingerina (34-4%)
Atlantic ocean	- Globingerina (40%)

Abysal hill / seaknolls - volcanic hills lower height.

seamount - conical volcanic hill, always below sea level.

Guyots / Tablemounts - flat topped volcanic hills.

Shoal - Detached elavation with shallow depth.

Isthmus - A narrow creek of land that connects two larger landmasses is called Isthmus.

Strait - A narrow waterways that seprate two pieces of land is called strait.

Cape - land's end i.e. the tip of the least land projects in the sea is called cape;

Oasis - a small area of greenery & water in desert.
मरुद्यान

Zeneith - The point in the sky i.e. directly above the observer is zeneith.

Doger Bank - U.K, Grant Bank - USA.

Atlantic -

- 1/6th of globe & 1/2 pacific ocean - 82,00,000 km²
- Dolphin Ridge - Northern & Challenger ridge - southern
- Telegraphic plateau.

Ridges - ① wyville Thompson ⑪ Azores
⑫ Sierra ⑬ Rio Grand
⑭ walvis.

Deeps - 29 deeps
Romanche - 9970 m.
Purterico - 8385 m.
Colombia - 5125 m.

Pacific :

- 1/3rd area of globe 167,00,000 km².
- islands - 20,000.

Ridge - Albatross plateau
① Galapagoss Ridge. ⑪ Newzeland Ridge
⑫ Hawaiian Rise ⑬ Mioner Ridge - Nazca, Lord Howie, Norfolk, Equinpik, Solmon.

Deeps - 32 deeps
mariana - 11.02
Tonga - 10.88
Kurile - 10.49
Phillipines - 10.47
Jagan - 10.37
Karmadec - 10.04

Indian -

- Y shape. , Deeps are almost absent.

& formed by block mountain of Gondwana.

Ridge -

① Socotra chagoes ridge
② madagascar ridge
③ Seychelles ridge
④ SW Indian
⑤ Ninty east
⑥ Carlesberg

Trench -

Sunda - 7450 m.
Ob - 6375 m.
Mariana -

Deposits in sequence:

1. Red clay
2. Globigerina
3. Diatom
4. Radolarin

1.	Submarine canyon are found on	- continental slope
	form due to	- turbudity current
2.	Total length of ocean ridge in the world.	- 64,000 km.
3.	continental slope occupied total ocean area	- 6.5 /.
4.	longest trench of world	- Peru, chile.
5.	Grand Bank famous for	- Deep sea fisheries.
6.	A group of islands	- Archipelago
7.	summer salinity in polar area's	- Decreases.
8.	The Norwegin sea & North sea has higher salinity because of Gulf stream.	
9.	world highest salinity latitude is	- 40°
10.	Gravel & Sand deposited in	- Littoral zone.
11.	Evaporite deposits form	- Dead sea.
12.	Surface current in ocean primarily	- wind action.
13.	Green mud components	- Glyconite & CaCO3.
14.	Limestone deposits	- shallow sea.
15.	Reef building corals are	- Hermatypic.
16.	maximum development of corals	- Pacific ocean.

1. Bizelhoff - Scattered popln settlement in Germany.
2. Dormitary settlment - resident active popln commutes for employment elsewhere.
3. Settlment Type
   (i) Clustered settlment → Gagantic plain
   (ii) riucleated " → Arid regia
   (iii) Circular " → island region
   (iv) Dry point " → Deltas
   (v) wet point " → Deserts
   (vi) mothe settelement → Birth to neco
4. Roof of houses depends on - Climatic conditions.
5. Courtyards - The outer boundry of house
6. memphis - earliest city of the world
7. Ugrait - earliest cities of the New world.
8. Gap towns - towns situated in the pesticular pass.
9. Rank size rule - Urban settlement.
10. Hiercarchy of urban places - popln size.
11. Senile Towns - Relict stage.
12. Ghost Towns - Deserted Town.
13. megalopolis - Highest stage of city growth.
14. Brsenyev - cities were divided in function basis.
15. BJL Berry - Density gradient for compansing different cities.
16. Sjoberg model - structes of urbanisation before the modern era.
17. Alonso model - pattern of landuse & land value of urban area.
18. Nested Hierarchy - A K Philbrick.
19. Chennai - Best corporate health care system in the country.
20. Urban Decay - Industralization & rapid urbanization.
21. Exurbanites - The commuters beyond the continious urban built up area.

Conurbation : Continiously built up area formed by coalescence of several urban settlment.

megalopolis : A continous belt of urban popl" progressively linking several cities.

Genetrification — is a process where by the social character of a neighbourhood is changed by the infiltration of professional / higher income group seeking city location.



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1. Indian island betⁿ India & srilanka - Rameshwaram
2. Valley of flowers - U.P.
3. Southernmost point of Indian mainland - Pygmallion point
4. Exclusive Economic zone (EEZ) - 2·02 m km²
5. Coal deposits are associated with - Gondwana deposits.
6. Origin of siwaliks - Pliocene. (2m) ago.)
7. Gondwana Land spitted during - Jurassic period.
8. Maldive islands - Volcanic
9. Dhang, Dundwa & chuma range siwalik. - Nepal
10. Makalu & manalu. - Himadri / Greater Him.
11. Rest of India & kashmir connecting - Banihal pass.
12. Dhauldhar ranges - Himachal (Lesser H.)
13. ancient India link betⁿ srilanka - wellington island.
14. Alluvial track betⁿ two river - Doab
15. shifting of dunes in Rajsthan. - Dhrian
16. flood plain in Punjab - Bets.
17. Mawsmai falls - Meghalaya.
18. Applacian associated with - Satpura
19. Glacier of Karakoram - Baltora
20. Bundelkhand & Baghelkhand - M.P.
21. Lakshdweep means - 1 lakh islands
22. Indian coast are of - Pacific type
23. Backwater of malbar palain called - Pozhi
24. The joint stream of Ganga & Brahmputra in Bangladesh - Padma.
25. India & Nepal boundries - Kali
26. Largest freshwater wetland in India - Kolleru
27. Asias largest freshwater Wetland - Kabar (Bihar)
28. 'sorrow of Bihar' - Kosi
29. 'Biological Desert' - Damodar
30. Ganga delta growing rate - 3ft/year

1. ICRISAT located - Hyderabad.
2. Western disturbances bring rainfall - Bihar - U.P - W.B.
3. World rainest spot after mawsynram - Hawaii.
4. Climatic classifiⁿ of India based on temp. & rainfall - Koppen.
5. Total rainfall recived in the country - 400 mham.
6. variablity of rainfall be highest - Rajsthan.
7. maximum forest cover / Total area - Andman & Nicobar
8. maximum per capita forest area - Arunachal
9. Largest proportion area under forest cover - madhyPradesh.
10.

	River	origin
1.	Brahmputra	→ Chemayutra Glacier.
2.	Sutlej	→ Kailas region
3.	Indus	→ Senegge Khabab
4.	Beas	→ Rohtag Pass.
5.	Jhelum	→ Verinag
6.	chinab	→ Lahul
7.	Ravi	→ Kulu hills.
8.	Gomti	→ Nainital
9.	Ghagra	→ East of Mansarovar
10.		
11.	~~Himalaya = Bt~~	~~→ Black~~
	Narmada	→ Amarkantak
12.	Tapti	→ multai
13.	Mahanadi	→ Pharsiya
14.	Baharani	→ Nagri
15.	Son	→ Amarkantak
16.	Godavari	→ Trimbkeshwar
17.	Painganga	→ Buldhana
18.	Wainganga	→ Betul
19.	Indravati	→ Kalahandi
20.	Pennar	→ chennakeshwar
21.	Tungbhadra	→ Gomantak

*	Mountain	Type
1.	Himalaya	→ Fold
2.	Sahyadri	→ Relict
3.	Rajmahal	→ Volcano
4.	Nilgiri	→ Block

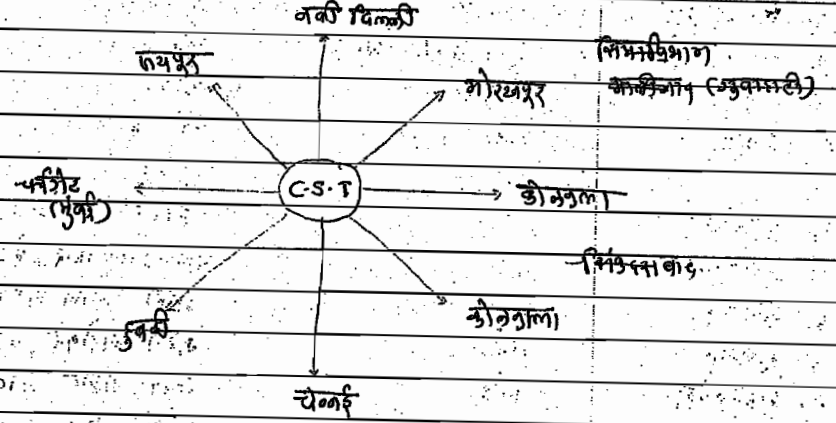
Forest Type

1. Tropical wet evergreen → Arjun, Toon, Poon, Rosewood
2. Tropical moist Deciduous → Euphorbins, Bamboo, Sandalwood, Teak, Shisham
3. Thapical Thorn → Chapleo, Khair
4. Sub Tropical pine → Oak, Junipes,
5. Tropical Dry Deciduous → Acacia

* Binary — 0-1
Octal — 0-7
Decimal — 0-9
Hexadecimal — 0-9 A-F

* $(17)_2$

2 | 17		10001
2 | 8	1	$1\times2^4+1\times2^0$
2 | 4	0	16+1
2 | 2	0	=17
1	0	



उत्तर पूर्व सीमा विभाग	- भाकीनाव (गुवाहाटी)
दक्षिण - मध्य विभाग	- सिकंदराबाद
पूर्व मध्य विभाग	- हाजीपुर (बिहार)
उत्तर मध्य विभाग	- भोपाल
दक्षिण - पूर्व - मध्य विभाग	- बिलासपुर
पश्चिम मध्य विभाग	- जबलपुर

	राज्य	नदी	प्रकल्प
1.	जम्मू व काश्मीर	चिनाब	रनबीर
2.	हिमाचल प्रदेश	सतलज (बियास)	गोविंदसागर
		सतलज	भाक्रा
3.	पंजाब	सतलज	नांगल
		सतलज	हरिके
4.	उत्तरांचल	गंगा	टेहरी, रामगंगा
5.	राजस्थान	चंबळ	राणाप्रतापसागर, कोटा बंधारा
6.	गुजरात	मही	माही बजाज सागर
6.	गुजरात	नर्मदा	सरदार सरोवर, जोडा
7.	मध्यप्रदेश	नर्मदा	नर्मदा सागर, तवा
		चंबळ	गांधी सागर
		बेटवा	माहीतिलो
8.	महाराष्ट्र	गोदावरी	नाथसागर
		कृष्णा	कोयना
9.	छत्तीसगड	सोन	गोविंद वल्लभ पंतसागर
10.	ओरिसा	महानदी	हिराकूड
		ब्राह्मणी	रेंगली
11.	आंध्रप्रदेश	मांजरा	निजामसागर
		कृष्णा	नागार्जुनसागर
12.	तामिळनाडू	कावेरी	कृष्णराजसागर
			स्टॅन्ली मेट्टूर

नं.	राज्य	लोकसंख्या	नंतर राज्य	लोकसंख्या
1.	राजस्थान	342239	1 अंदमान व निकोबार	8249
2.	मध्यप्रदेश	308000	2 दिल्ली	1483
3.	महाराष्ट्र	307713	3 पाँडिचेरी	492
4.	आंध्रप्रदेश	342289 275069	4 दादरा-नगर हवेली	491
5.	उत्तरप्रदेश	308000 238566	5 चंदीगड	114
6.	जम्मू व काश्मीर	307713 222236	6 दमण व दीव	112
7.	गुजरात	196024	7 लक्षद्वीप	32
8.	कर्नाटक	191791		
9.	हरियाणा	155707		
10.	छत्तीसगड	136034		
11.	तामिळनाडू	130085		
12.	बिहार	94163		
13.	पश्चिम बंगाल	88952		
14.	अरुणाचल	83743		
15.	ओरिसा	79734		
16.	आसाम	78438		
17.	हिमाचल	55673		
18.	उत्तरांचल	53484		
19.	पंजाब	50362		
20.	हरियाणा	44212		
21.	केरळ	38863		
22.	मेघालय	22429		
23.	मणिपूर	22327		
24.	मिझोराम	21081		
25.	नागालँड	16579		
26.	त्रिपुरा	10492		
27.	सिक्किम	7096		
28.	गोवा	3702		

	नदीचे	उगमस्थान	उपनदीचे	कोणत्या राज्यातून/देशातून वाहते.	कोणत्या समुद्रास मिळते.
अ)	हिमालयात उगम पावणाऱ्या नद्या :				
①	सिंधू	मानसरोवर	स्योक, जिलमिट	तिबेट, भारत, पाकिस्तान	अरबी समुद्र.
i.	सैतलज			भारत, पाकिस्तान	सिंधू
ii.	बियास			भारत	सतलज
iii.	रावी			भारत, पाकिस्तान	बियास
iv.	सतलज	राक्षस सरोवर	बियास, सैतलज, चिनाब	तिबेट, Himachal, Punjab.	सिंधू
②	गंगा	गंगोत्री	यमुना	उत्तराखंड, उ.प्र, बिहार, प.बंगाल.	बंगालचा उपसागर
i.	भागीरथी			उत्तरप्रदेश	गंगा
ii.	भागिरथी	हिमाचल	रावी	हिमाचल, उ.प्र. बिहार	गंगा
iii.	घाघरा	नेपाळ		नेपाळ, उ.प्र.	गंगा
iv.	गंडक	नेपाळ		बिहार	गंगा
v.	कोसी	चीन		नेपाळ, बिहार	गंगा.
③	यमुना	यमनोत्री		हिमाचल, उत्तराखंड, हरियाणा, दिल्ली, उ.प्र.	गंगा
i.	चंबळ	पश्चिम पर्वत	चंबळ	म.प्र, उ.प्र.	यमुना
			बेतवा	म.प्र, उ.प्र.	यमुना
			सिंधुआ	म.प्र, उ.प्र.	यमुना
			केन.	म.प्र, उ.प्र	यमुना
④	शोण	म.प्र		म.प्र. उ.प्र. बिहार	गंगा
⑤	दामोदर	छोटा नागपूर पठार		बिहार, झारखंड, पश्चिम बंगाल	हुगळी

	नदीपुराणी	उगमस्थान	उपनदीचे	कोणत्या राज्यांतून/देशांतून वाहते.	कोणत्या समुद्रास मिळते.
⑥	ब्रह्मपुत्रा	मानसरोवर	सुबनसिरी, मनास, निकना	चीन, अरुणाचल (दिहांग) आसाम, बांग्लादेश. भारत, प. बंगाल बांग्लादेश.	बंगालचा उपसागर ब्रह्मपुत्रा
ब)	भारतीय पठारावरील नद्या -				
अ)	परिसप्त वाहिन्या नद्या -				
①	नर्मदा	अमरकंटक		अमरकंटक, म.प्र., महाराष्ट्र व गुजरात	अरबी समुद्र.
②	ताप्ती	मुलताई	पूर्णा, गिरणा पांझरा	म.प्र. महाराष्ट्र, गुजरात	अरबी समुद्र
③	माहीसागर			गुजरात	खंबायत आखात
④	माही	विंध्य पर्वत		म.प्र. गुजरात	खंबायतचा आखात
⑤	साबरमती	अरवली पर्वत		राजस्थान, गुजरात	कच्छ रण.
⑥	पेरियार			केरळ	अरबी समुद्र
ब)	पूर्व वाहिनी नद्या -				
i.	महानदी	छत्तीसगड (रायपूर)	शिवनाथ, मांदळी, हसदो	म.प्र., छत्तीसगड, ओरिसा.	बंगालचा उपसागर
ii.	गोदावरी	त्र्यंबकेश्वर	मांजरा, प्राणहिता, इंद्रावती, शबरी, मांजरा	महाराष्ट्र, आंध्रप्रदेश.	बंगालचा उपसागर.
iii.	कृष्णा	महाबळेश्वर	मलप्रभा, कोयना, तुंगभद्रा	महाराष्ट्र, कर्नाटक, आंध्रप्रदेश.	बंगालचा उपसागर
	भीमाशंकर	भीमा	भीमा, कृष्णा	महाराष्ट्र, कर्नाटक. कर्नाटक, आंध्रप्रदेश.	कृष्णा कृष्णा
iv.	पेन्नार			कर्नाटक आंध्रप्रदेश	बंगालचा उपसागर
v.	कावेरी	कर्नाटक	भवानी, अमरावती	कर्नाटक, तामिळनाडू	"
vi.	कृष्णरी	छोटा नागपूर		झारखंड बिहार, ओरिसा	"
vii.	सुवर्णरेखा	"		झारखंड बिहार, ओरिसा	"

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- A_{00} पालापाचोळा व कर्बाची अवशेष
- A_0 मूळ स्वरूप ओळखता येणार नाही इतपत अपघटीत झालेले कार्बनी अवशेष.

कार्बनी पदार्थ

- A_1 खनिजयुक्त : स्पंजसदृश्य
- A_2 खनिज थर - चिकणमाती लोह, Al.
- A_3 A_1 | A_2 व B संक्रमणाचा थर अधिकतर 'A' प्रकारी लक्षणे.
- B_1 B व A_1 | A_2 संक्रमणाचा थर अधिकतर 'B' प्रकारी लक्षणे.
- B_2 'B' च्या गुणधर्माचे जास्तीत जास्त दर्शन.
- B_3 B व C प्रकारांचे संक्रमणाचा थर.

A व B

मृदा प्रक्रिया उत्पत्तीचा विविध प्रक्रियांनी तयार झालेले थर.

- C_1 खनिज थर : मूळ खडकाचा थर कोठून कसले व त्यांचे मातीचे साठवण.
- C_2 तळाचा खडकाचा घट्ट थर.

अविघटित मूळ खडक

C

विघटीत खनिज पदार्थांचा/ अविघटीत पदार्थांचा थर.

DATE

- Origin of ocean basin
- Bottom relief of Indian, Atlantic and Pacific oceans.
- Ocean deposits.
- Coral Reefs.
- Temprature and salinity of the ocean, Density of sea water.
- Tides and ocean currents.
- Sea level changes.
- Major water masses of the world's oceans.
- Biological productivity in the oceans.

DATE

Origin of The Earth:

1. Gaseous Hypothesis of - Kant
2. Nebular Hypothesis of - Laplace
3. Planetesmal Hypothesis of - Chemberlin & moulton
4. Tidal Hypothesis of - James Jeans.
5. Binary star Hypothesis - Russell
6. Supernova Hypothesis - Hoyle & Littleoam.
7. Inter-stellar Dust Hypothesis - Otto Schimidt.
8. Big Bang Theory : A.G. Lamentere
9. Binary star Theory : H.N. Russel
10. Capoheid Theory : A.C. Banerjee.

DATE

ORIGIN OF OCEAN BASIN

- Some theories have been given to example the origin of continents and oceans, which are as follows:

1) **Nebular Hypothesis:**

'Immanual Kant' (1755)

- He belived that the earth and our solar system has condensed from a rotating cloud of primoridial matter of dust and gas.

- 'Laplace', disagreeing with Kant's idea regarding the primordial matter of Nebula, assumed the sun as the rotating disk of hot gaseous matter.

rotating gaseous disk contraction form planet.

- The constant cooling, contraction led to increase in speed of rotation and resultant increased centrifugal force caused the seperation of rings from the equatorial circumference, which ultimetly aggregated to form the planets.

- The same process led to origin of moon as a satellite to earth. In the course of time moon and earth cooled down resulting in to rocky crust.
  - ① The superficial layer, cooled rapidly than the internal layers.
  - ⑪ The upper crust unsupported, which later sank down and fitted on the lower layers.
  - ⑪ Thus resulting in to crumples; folds and deformations.
- The higher areas thus became continents and lower areas gave birth to oceanic depressions, which the water vapour previously held in the atmosphere rained and formed the primitive oceans.

2) **Planetesimal Hypothesis:**

T.C. Chembarlin (1904) and Moulton.

- According to him due to interaction of sun and another star, ejection of smaller jets of solar matter became nuclei for different planets which later on grew by constant aggregation of planetesimals.

interaction of sun & another star

* 97.2% water of the world is shoared in the oceans.
- aquasphere (70.8%) liquid portion of ocean.
- Cryosphere (29.2%) solid sphere of ocean.

DATE

- The oceans began to form in depressions created by Volcanic action and the condensed vapour in atmosphere rained to fill up the oceans.

3) **Tetrahedral Hypothesis -**

Lowthian Green (1875).

(i) The more of land area in northern hemisphere and southern area covered water.

(ii) The continents are triangular in shape with their base in the north & their apex in south.

(iii) The ocean are triangular in shape base in the south & apex in the north.

(iv) North pole is surrounded by the Arctic ocean while south pole is surrounded by Antartic continent.

(v) Land and sea almost 'antipodal' on surface of earth.

- According to 'Green' ocean were created on the plane faces of terrestrial tetrahedral where as the apex of tetrahedral becomes continental masses.

4) **Wegner's Theory -**

Alfred Wegener (1912)

- He forward the concept of 'Displacment Hypothesis'.
- He said that the present arragment of continents & oceanic basins is regarded as a result of the fragmentation by rifting & drifting a past of the original continental and mass known as Pangea surrounded by a unversal ocean Panthalasa.

* Jeans and Jeffreys : Tidal Hypothesis (1929)
* Chamberlin & moulton : Planetesimal Hypothesis (1905)
* Kant and Laplace : Nebular Hypothesis. (1796)
* Hoyle and Littlebon : Supernova Hypothesis (1939)

DATE

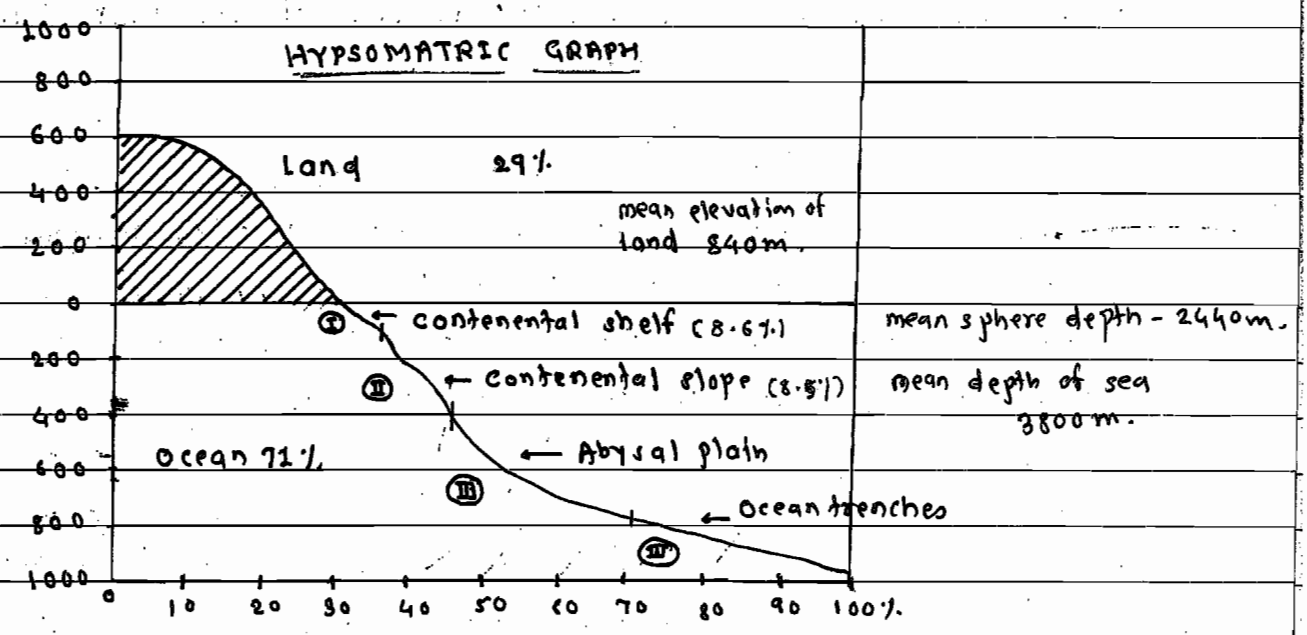
RELIF OF THE OCEAN BASIN:

(509,950,000 km^2) (148,890,000 km^2)

- The world ocean bodies covered about 71% & Land 29%.
- The avarage depth of ocean basin is about 3800 mtr.
- It is total volume of world water about 97.2%, fresh water besides 2% and ice sheet in represented 1%.
- The N. hemisphere land area 60.7% called 'land hemisphere'. while S. hemisphere 80.9% of the total surface of water.

'The oceanography is the branch of science which deals studies within physical and chemical charactaristics of ocean water. It's depth, temprature, salinity, different motion i.e. current, waves, tides flora and fauna found on the bottom of relief'.

- The different part of the ocean floor:



- The avarage depth of seas is almost 3790 mtr (3800 m.)
- The avarage elevation for the continents 840 mtr.
- The highest peak of continent Mount everest 8848 mtr.
- The greatest ocean depth of Mariana trench 12000 mtr.

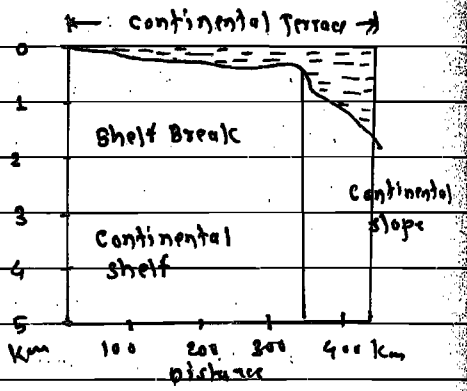
'The different height and depth zone of the lithosphere and hydrosphere are represented by hypsographic and hypsometric curve'.

classmate PAGE

DATE

a) **Continental Shelf :**

"The continental marginal areas submerged under oceanic water with avarage water depth of 6 feet (100 fathom) or 180m. and gently sloping (1°-3°) towards the sea or the oceans are called continental shelf."



* **Characteristics :**

① The shelves are narrow where high mountains are very close & parallel to the coast e.g- Pacific continental shelf.

② The shelves are wider where the coast lands are wide plains.

③ Continental shelves represent 8.6% of the total area of the ocean basins.

* Regionally Atlantic (12.8%), Pacific (5.7%) & Indian ocean (4.2%).

- It's higher parts project as islands, an angle of less than a degree.

* **Origin of Continental Shelf -**

1) **The result of marine erosion and fluvial deposition -**

- Marine waves and currents erode the continental margins and platform recive deposits of sediments by rivers and sea waves.
- The sedimentation are continiously consolidated under sea water and ultimetly continental shelves are formed.

2) **Thermal convective currents -**

- Rising the thermal convective currents from beneath the continental margins, and the ocean boundry and descend.
- The resultant compresive force causes subsidence of the continental margins & thus continental shelves are formed.

3) **Tectonic activities -**

- The parallel faults are created in the continental margins.
- The causes subsidence of the marginal land areas and consequent submergence under sea water.

- Such submerged land areas become continental shelves, which are generally called tectonically formed 'continental shelves'.

4) Glacial control Theory - 'R.A. Daly'

- The sea level fell by 38 fathom during 'Pleistocene Ice Age' with the result the continental margins which were previously submerged became free from sea water.
- These exposed land areas were glacially eroded & extensive platform formed.
- Due to deglaciation the sea level rose again & these platforms were submerged under seawater & thus extensive continental shelves are formed.

5) Coastal erosion -

- The coastal lands are eroded work of strong sea waves & sea cliffs are formed.
- The fall of hanging crests & thus extensive wave cut platform formed
- These platforms are submerged under sea water to form continental shelves.

* Continental shelves of India -

- The continental shelves of Ganga, the Godavari, the Krishna, and the Cauvery mouths have been formed through-delta formation.
- The continenal shelves of western coast are due to - faulting and consequent submergence.
- The continental shelves form 'Madinapur to Madurai' - sedimentation,
- Andman & Nicobar, Lakshdweep & Gulf of Manar are originated due to - coral reefs.

"The boundry of the continental shelf on the ocean side is determined by an abrupt change in slope and a rapid increase in depth called **continental shelf break**"

- The continental coast along the eastern coasts (500 km) and western coast (150 km) wide.

DATE

b) **Continental Slope:**

'The steep slope extending to the ocean basins floor from the continental shelf break is known as the continental slope'.

* **charactaristics -**

1) The avarage slope is about 4.3° although near the continental break, it ranges
2) The gradient decreases as the slope merges with deep sea floor at depths of about 3000 - 4500 m.
3) Continental slopes occupy only 8.5% of the total area of the ocean basins.
4) The most extensive continental slopes are found bet^n 20°N & 50°N lattitude and 80°N & 70°s lattitudes.

* **Origin of continental slopes -**

(a) By continental rifting. to tectonic theory faulting is held responsible for the origine of continental slopes.
(b) The continental slopes are formed due to bending and warping of continental shelves by sedimentation.
(c) Erosion theory slopes are formed due to erosion by marine process mainly sea waves.

'At the base of continental slopes, the steep gradients of the slope decreases to 1° or less continuing into the abyssal hills or plains. This portion of the sea floor is called continental rise'.

c) **Deep sea plains:**

Deep sea plains are charcterized by flat and rolling submarine plain is the most extensive relief zone of the ocean basins.

* **charactaristics -**

1) These deep seated plains having the depth from 3000 m to classmate 6000 m.

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ii) The total area of the ocean basin cover 75.9 percent.

iii) Deep sea plains are generally featurless but a few long, narrow and elongated ridges, guyots are significant relief.

iv) Deep sea plains are characterized by pelagic deposits of plant, marine animal and siliceous remains absence.

v) Volcanic deposits have been reported a few places in different oceans.

d) **Ocean Deeps:**

'Ocean deeps representing depressions and trenches on the ocean floors are the deepest zones of the ocean basins.

- These are generally located parallel to the coast facing mountains and along the islands.
- Ocean deeps are grouped in to two categories:

① **Deeps** - are very deep but less extensive depression are called 'deeps'.

② **Trenches** - long and narrow linear dipression are also called 'Trenches'.

- These deeps & slopes are generally characterized by very steep slopes. Sometimes are almost vertically.
- Marinas Trench (11.0 km), Phillipines Trench (10.5 km), Kuriel-Kamchtka Trench (10.5 km), Bonin Trench (9.8), Japan Trench (8.4).
- 57 deeps : Pacific (32), Atlantic (19) & Indian (6) deeps.

e) **Submarine Canyons:**

'Long, narrow and very deep valley or trenches reached on the continental shelves and slopes with vertical walls resembling the continental canyons are called submarine canyons'.

- These are classified in to ① Glacially eroded canyons.
② Non-glacial eroded canyons.
- According to 'Sheppard" the sub marine canyons are similar to the youthful river valleys.

* **Characteristics:**

i) The submarine canyon are generally straight.

ii) The gradient of submarine canyons is steeper than the continental canyons.

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- Big Bang Theory - A.G. Lamentere.
- Binary star Theory - H.N. Russel.
- Cepheid Theory - A.C. Banerjee.

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iii) The sub marine canyons are generally several km wide at their heads & avarage length is 16 km.

iv) The depth of submarine canyons are vary from 610 m to 915 m.

v) The submarine canyons carry various types of ocean deposits include sands, clays, silt, gravels and pebbles.

* Origin Theory -

1) Diastrophic Theory.
2) Subareial erosion theory.
3) Submarine density current theory.
4) Turbidity current Theory.

* Abyssal hills / seaknolls -
'The volcanic hills of lower height are called abyssal hills or seaknolls'.

* Sea mounts - 'The conical volcanic hills submerged under ocean water i.e. always below sea level, are called sea mounts'.

* Tablemounts / Guyots - 'Flat topped volcanic hills are called Guyots'.

* Shoal: Detached elevation with shallow depth.

	Area (km²)		
Globe	509,950,000		
Hydrosphere	361,060,000	71%	3/4
Lithosphere	148,890,000	29%	
Pacific	165,000,000		
Atlantic	82,000,000		
Indian	73,000,000		

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A] BOTTOM RELIEFS OF THE ATLANTIC OCEAN:

- The Atlantic ocean located bet^n north & south Americas in the west & Europe and Africa east, covers an area of 82,000000 km^2.
- It's cover area 1/6th of the geographical area of the globe and 1/2 of the Pacific ocean.
- The Atlantic Ocean was formed due to drifting of N.& S. Americas to the west due to plate techtonics.
- The ocean widens maximum width of 5920 km at 35°S latitude and narrows down towards equator only 2660 km.
- The Atlantic ocean was first formed about 700 million yrs. ago, due to sea floor spreading.

a) Continental shelf -

- continental shelves have developed width ranges from 2-4 km to more than 80 km along both coast of Atlantic ocean.
- These become narrow mountains & hills the border coasts - e.g. African coast and Brazilian coast.
- The shelves become 200 to 400 km wide along NE coast of north America NW coast of Europe.
- Extensive shelves are found Newfoundland, British Islands, Greenland, Babia Blanca and Antartica.

b) Mid Atlantic Ridge -

- The mid Atlantic ridge representing striking relief feature which having 'S' shape extend for 14,450 km from Iceland in the north and to Bouvet island in the south.
- It's goes down more than 4000 m below sea level.
- The ridge is known as 'Dolphin Rise'(N) to the northern part and & southern part of ridge is called 'challenger ridge'.(S)
- The ridge becomes quite extensive to the south of Greenland and Iceland and is called 'Telegraphic Plateau'.

* Branches :

① Wyville Thompson Ridge - It's between Iceland & scotland.

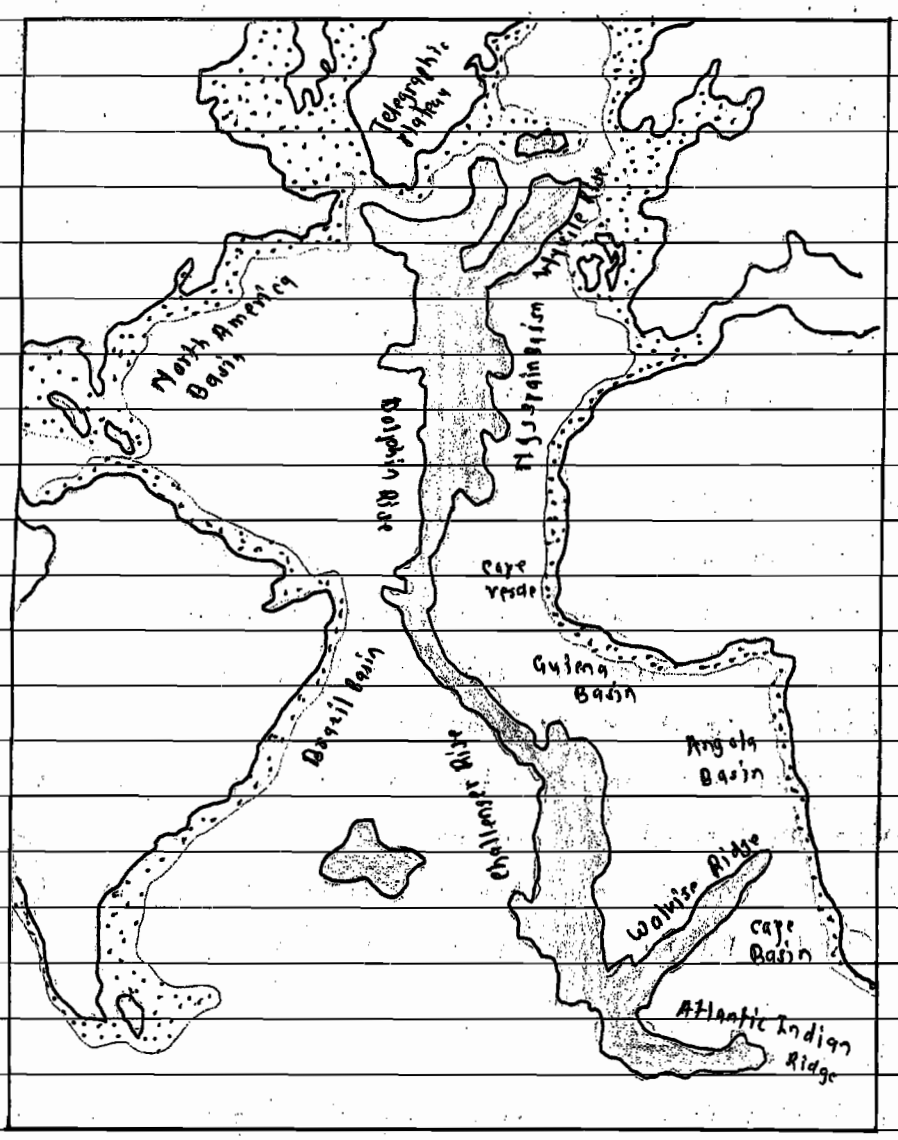
② Azores Ridge - A branch of central ridge near 50° latitude east near Newfoundland.

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(iii) Sierra Leone Rise - extends towards NE and Para Rise stretches in NW direction.

(iv) Walvis Ridge - extends towards NE and merges with African coast.

(v) Rio Grand Rise - extends towards south American coast.



c) Ocean Basin -

- The mid Atlantic Ridge divides the Atlantic ocean into two major basins east and west Atlantic.

(i) Labrador Basin - extends betⁿ Greenland in the north & Newfoundland Rise in the south, The depth of basin ranges 4000 to 4800m.

(ii) North American Basin - extends betⁿ 12° N and 40° N latitudes. The depth is more than 5000m.

(iii) Brazilian Basin - The equator and 30°s latitude and east coast of Brazil. The depth is more than 4000 m.

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(iv) Spanish Basin - is located bet^n the mid Atlantic ridge & Iberian Peninsula. The avarage depth is 5000 m.

(v) N & S Canary Basin - is comprised is two almost circular basins and is 5,000 m and more.

(vi) Cape varde Basin - It located bet^n mid Atlantic ridge & west African coast extends from 10°N to 23°N. Avarage depth 5000 m.

(vii) Guinea Basin - extend from NE to SW Guinea Ridge to Sierra Leone Rise & measures 4000 to 5000 m.

(viii) Angola Basin - is located bet^n the equator & 30°s latitude. The avarage depth is 5000 m.

(ix) Cape Basin (25°s - 45°s), Agulhas Basin (40°s - 50°s), Argentina Basin (35°s - 50°s).

d) Ocean Deeps :

- The no. of deeps in the Atlantic ocean is far less than in the Pacific Ocean, because absence of the effects of Tertiary organic movments along the Atlantic coasts.
- Murry has identified 23 deeps upto the depth of 3,000 fathom. (5,500 m) in the Atlantic ocean.
- Romanche deep (8,370 m), Purtco Rico Deep (8385 m), Colombia Deep (5125 m), Nares Deep (6,000 m), Vema Deep (4900 m)

e) Marginal Sea -

(i) Mediterranean sea - It divided into two basin East & West Basins. Broad continental shelves are found along Spanish, Italian, Greek, Egyptian, Tunisian & Lybian coasts.

(ii) Caribbean Basin sea & Gulf of mexico - are separated by a 1600 m deep ridge running bet^n Yucatan Peninsula & Cuba Island.

(iii) American coast there are Baffin Bay, Hudson Bay.

f) Islands -

(i) New foundland & British Isles - are famous islands in N. America.

(ii) West Indies located bet^n N & S Americas.

(iii) Greenland & N. Scotland are situated on mid Atlantic ridge.

(iv) Other - Folkland, South Arches, Shetland, Sandwich, Ascension, Tristan de Ghana, Barmuda, madeira, Canadies etc.

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B] **BOTTOM RELIEFS OF THE PACIFIC OCEAN:**

- The Pacific Ocean, the largest ocean of the world having 1/3rd area of the globe. area covers 16,57,23,740 km².
- It extends from east to west 16000km and for 14,480 km from north to south.
- Avrage depth of the ocean in 4,572 m.
- The ocean has the largest no. of islands more than 2,000 islands.
- **Johnson** has divided the Pacific ocean in to four sub-regions: (i) Northern Pacific (ii) Central Pacific (iii) The South West Pacific (iv) South East Pacific.

a) **Continental Shelf** -

- Continental shelves are eastern & western coasts of the Pacific.
- The shelves are broad & extensive along the eastern coast of Australia & Asia, width varies from 160 km to 1600 km.
- The continental shelves are less extensive along the western coasts of Americas because nearness of corillerean chains of folded mountains. The avarage width is 80 km.

b) **Mid-Oceanic Ridge: (East Pacific Rise)** -

- The Pacific ocean does not have central ~~the~~ mid oceanic ridge like Atlantic, albeit there are a few scattered ridges having local importance.

(i) **Albatross Plateau** -

The east Pacific Rise know as Albatross plateau is 1600 km wide & its extend from north of Newzeland to the californian coast.

- It sends of two branches betⁿ 23°S - 35°S

(ii) **Galapagos Ridge** -

are runs to eastern parallel Pacific ridge. Galapagos ridges are two branches: Carnegie ridge and cocos ridge.

(iii) **Newzeland Ridge** -

It is about 200 m to 2000 m below sea level and widens from fiji island to fiji plateau.

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(iv) Hawaiian Rise -

extends from NW to SE direction bet^n 35°N - 17°N for distance of 960 km. This is most extensive ridge 2640 km of the Pacific ocean.

(v) Minor Ridges -

- Nazaca Ridge : Peru coast
- Lord Howe Rise : east coast of Australia bet^n 20°S & 40°S -
- Norfolk Island Ridge : bet^n New Caledonia & Newzeland (23°S - 35°S).
- Louisiade - New Guinea Rise : N. of New Guena parallel to 140°E longitude.
- Solman Ridge :- north of Soloman Islands etc.

c) Ocean Basins :

- These basins are seprated by ridge and 'rises'.

(i) Phillipine Basin - is located to the east of Phillipines and extends from southe of Japan to 5°N latitude. Avarage depth 5000 - 6000 m.

(ii) Fiji Basin - is located to the south of Fiji Island bet^n 10°S & 20°S and the avarage depth is 4000 m.

(iii) East Australian Basin - is located east coast of Australia & Newzeland - Ridge with avarage depth more than 5000 m.

(iv) Peru Basin - is located west of Peru basin bet^n 5°S & 24°S latitudes The avarage depth is 4000 m.

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(v) South Australian Basin - is situated betⁿ the ~~south~~ coast of Australia having averaged depth of 5000 m.

(vi) SW Pacific Basin - is an elongated basin stretching betⁿ 20°S & 50°S lattitudes & 180-129°W longitudes.

(vii) Pacific-Antarctic Basin - is located to the SW of chilean coast betⁿ 40°S & 60°S latitudes & extends up to 130°W longitude.

d) **Oceans Deeps:**

- So far 32 deeps have been treated in the Pacific oceans. Most of the deeps are found western part of oceans.
- mariana (11.02 km), Tonga (10.88), kurile (10.49), Phillippine (10.43) Japan (10.37), Karmadec (10.04 kms). etc.
- The genesis of oceanic trenches & deeps is related mainly to tectonic activities.

e) **Marginal Seas -**

- Most of the marginal seas are along in its western coast. e.g. Bearing sea, sea of okhotosk, Sea of Japan, Yellow sea, East china sea, South china sea, celebes sea, are important.
- The west Pacific ocean has a longitudnal 'Gulf of California', sea of Coloumbia and the chilean sea.

f) **Islands:**

- Pacific ocean has nearly 20,000 islands, most of the islands are at the 'continental shelf.'
- Island on eastern coast i.e. Aleution, British coloumbia, chiljan Islands.
- The western coast of kasle, Japan, philipine, Indonesia and New Zeland.

	(km)
a. mariana	11.02
b. Tonga	10.88
c. kurile	10.49
d. Phillipines	10.47
e. Japan	10.37
f. ~~Kermadec~~ Karmadec.	10.04

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c] Bottom Relif of the Indian Ocean:

- The Indian ocean is the smallest of the three great oceans.
- The avarage depth of the ocean is 4000 m. to 5500 mtr.
- Almost 60% of its area forms an abyssal plain, ocean forming an inverted Y-shape.
- majority of this ocean is formed by the block mountains of Gondwana.
* - Johnson has divided the Indian ocean 3 zones:
  - (i) The western zone - betn African coast & mid Indian Oceanic Ridge has large no. of islands & its avarage depth 3650 m.
  - (ii) The eastern zone - deepest of all the zones with avarage depth 3550 m.
  - (iii) The central zone - the mid oceanic ridge where many tiny islands are located.

a) Continental Shelf:

- The most shelves are found along the margins of Arabian sea and Bay of Bengal, eastern coast of Africa & madagascar.
- On an avarage, the continental shelves are very wide (640 km) in the west whereas these are narrow (160 km) along coast of Java & sumatra.
- These become further narrow along the northern coast of Antartica

b) Mid - oceanic Ridge:

* Central or mid- oceanic ridge:
- It extends from the southern tip of Indian Peninsula in north to Antarctica in the south, and continious chains of highland form.
- Indian penninsula avarage width 320 km, this part of ridge is known as Laccadive - Chagos Ridge (maldive ridge).
- The ridge further extends southward & widens near equator is called 'Chagos - st. paul Ridge' betn equator & 30's (320 km width).
- These ridge further widens to 1,600 km betn 30°S and 50°S latitudes & is known as 'Amsterdam - st Paul Plateau.'
- The western branch known as Kerguelen - Gaussberg & eastern branch known as Indian Antarctic Ridge.

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- Branches of the Central Ridge:

(i) Socotra chagos Ridge- also known as 'Carlesberg Ridge' emerges from the central ridge at 5°S latitude

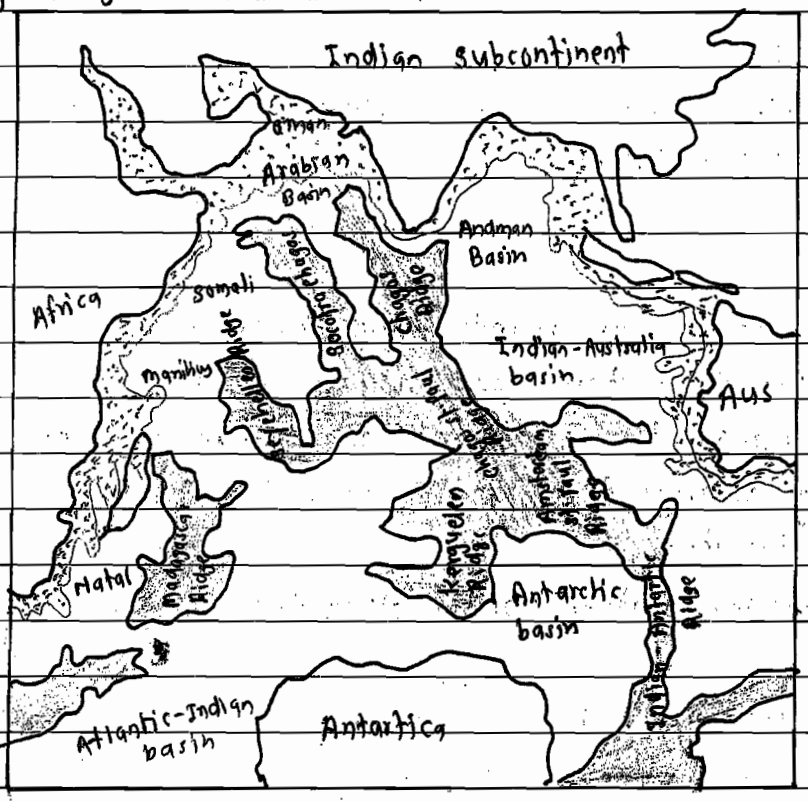
(ii) Seychelles - Mauritius ridge- Mauritius ridge bifurcates Mauritius islands & runs in roughly NW direction.

(iii) Madagascar Ridge - The southern tip of Madagascar to 40°S latitude.

(iv) SW Indian Ridge - The SW branch near 23°S latitude.

(v) Ninety East Ridge- extends from the continental shelf off the Irrawadi river mouth & runs in almost North - south direction parallel to 90°E longitude up to 40°S.

(vi) Carlsberg Ridge - Arabian sea.



(c) Ocean Basins -

- The mid-Indian oceanic ridge divides into sub-basins by the branches of central ridge.

(i) Oman basin- faces the Gulf of Oman with avarage depth 3,658 m.

(ii) Arabian basin - is located almost circular shape bet^n Laccadive chagos ridge & socotra, with the depth 3,600 m - 6486 m.

(iii) Somali basin - is bordered by Socotra - Chagos ridge & African coast in the west. The avarage depth is 3,600 m.

(iv) Mauritius basin- is located bet^n SW Indian ridge from 20°S to 40°S latitude. The depth varies bet^n 3,600 m and

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(v) Angulhas Basin - is elongated basin which is bordered by Madagascar ridge in the north east, Average depth is 3,000m.

(vi) West Australian Basin - is the SE. Indian Ridge in the SW Ninety East Ridge in the west, continental shelves of Java-Sumatra in the north east & continental shelf of west Australia.
- Avarage depth varies from 3,600m to 6,100m.

d) Deeps and Trenches:
- About 60% of the Ocean consits of deep sea plains with depth ranging from 3,600m to 5487m.
- Important deep sea plains are somali Abyssal plain, ceylone Abyssal plain, Indian Abyssal plain (4,380m).
- Significant trenches are Java or Sunda Trench (7,450m), Ob Trench (6,875m), Marihus Trench, Amirante Trench
- The deeps are almost absent.

e) Marginal sea's -
- The 'Arabian sea' and 'Bay of Bengol' are exclusion of the Indian ocean.
- The marginal seas worth the name are 'Red sea' & 'Parsian Gulf'.
- Red sea seprated Africa from Arabian Pennisula.

f) Islands -
- Madagascary srilandka' into island of large & part of mainlands.
- Socotra, zanzibar & camora are small islands.
- The Andaman & Nicobar part of 'Arakan Yoma' ranges of Mynmar.
- Lakshdweep, Maldive, chagos Diego, New Amsterdam, St. Paul are important island.

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CORAL REEFS

'Coral is a type of calcareous rock which is made of skeletons of minute sea organism known as '**polyps**'.

- There are nearly 100,000 species of coral polyps.

- 'Polyps die their skeletons are deposited at the sea floor and form a layer. When one generation of polyps, dies fresh structure are built upon the old skeleton by a new skeleton generation.
Thus a skeleton rock is created which is known as '**reef**.'

- Polyps million of small organisms e.g. Alage, Hydroza, Brgoza, Molluscs, forminfera. etc.
- coral reefs are more diverse than the tropical rainforests. because have about 100,000 species of which 10% have been studied. This is why these are called as '**rainforests of the oceans**'.

* Conditions for The Growth of Coral Polyps:

① **Temprature** – They require high mean annual temp. ranging bet^n 20°C -21°C (68°F-70°F) for their survival. They can not survive high temp & low temp.

② **Depth**- The maximum depth for ideal growth of corals is 200 to 300 ft. (60 - 91m) They die in water deeper than 91 m.

③ **Sediments** - There should be clean sediment free water because muddy water or turbid water resultant into their death.

④ **fresh water**- Polyps is required sediment-free water but fresh water is also injurious for the growth of corals.

⑤ **Ocean currents** - ocean current and waves are favourable for corals because they bring necessary food supply for the polyps.

⑥ **Salinity** - There should be sufficient salinity in the water 27‰ to 40‰. But too much salinity kills corals.

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* Coral animals belong to the organisms of "Phylum Anideliya".

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TYPES of Corals:

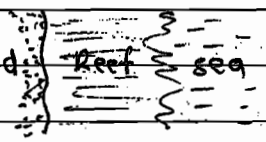
- 'Coral reef can be recognized on the basis of their structure and the underlaying substartum'.

1) Fringing reefs:

'coral reefs developed along the continental margins or along the islands are called fringing reefs'.

- The seaward slope is steep & vertical while the landward slope is gentle.
- The upper surface is uneven and corrugated.
- Though fringing reefs are usually attached to the coastal land and thus lagoon is formed betn the fringing reef & the land such lagoon is called 'boat channel'.
- Coral reefs are generally long but narrow in width.
- Coral reefs are two types:
  - (i) Coral reef facing open ocean
  - (ii) Coral reef protected by a barrier.

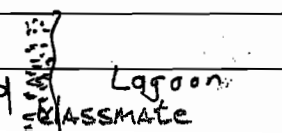
    e.g. Sakay island, southern Florida, Mehetia island etc.

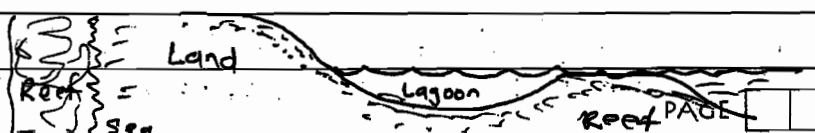




2) Barrier Reef:

- The largest coral reefs off the coastal platforms but parallel to them are called barrier reef'.
- The average slope is about 45° but sum barrier reefs are charactrized by 15°-25° slope.
- There is extensive but shallow lagoon betn the coastal land and barrier reef.
- Barrier reefs might have been formed at suitable depth but at much later date there might have been subsidence.
- Great barrier Reef, located parallel to the east coast of Australia, is the largest of world, at 9°S to 22°S latitude, length 1200 miles.





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8) **Atoll :**

"A ring of narrow growing coarals of horseshoe shape and crowned with palm trees called atoll".

- It is generally found around an island or in elliptical form on a submarine platform.
- There is a lagoon in the middle of coral ring.
- The depth of lagoon ranges betn 40 to 70 fathoms.
- Largest Atoll : 'Kwajalein' (marshall Island)

* Atolls are divided into 3 types :

① **True atoll -**

Charactrized by circular reef enclosing a shallow lagoon but without island.

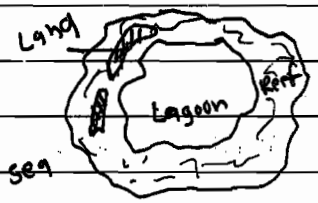
② **Island atoll -**

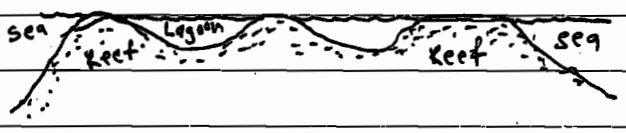
having an island in the central part of the lagoon enclosed by circular reef.

③ **coral island -**

does not have island in the begning but later on island is formed due to erosion and deposition by marine waves.

- Atolls are found in Antille sea, Red sea, china sea, Australian sea, Indonesian sea. funfutti Atoll of ellice Island is a famous atoll.





9) **Subsidence Theory of 'Darwin' :**

- Charls Darwin postulated his subsidence theory in 1837 and modified in 1842.
- According to him the land or island involved in the origin & growth of coral reefs undergoes gradual subsidence.
- According to him fringing reef, Barrier Reef & Atoll are successive stages of the development of coral reefs.

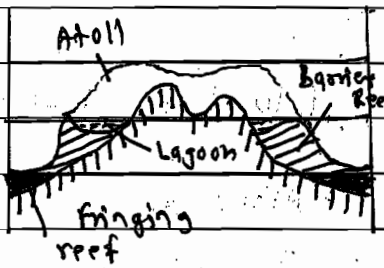
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① first of all coral polyps flock together along a suitable submarine platform & grow upward & ultimately reach sea level & fringing reef is formed.
- fringing reef are formed in stable condition of the land.

② They grow upward & outward at much faster rate so that they can get food for their survival.
- The growth of polyps is retarded near the shore of the land out it is very phenomenal & vigorous at the outer edge of the land.
- Consequently, a lagoon is formed betⁿ the coast & fringing reef and barrier reef formed.

③ There is further subsidence of the land & the island is completly submerged under water & a ring of coral reef in the form of atoll formed.

* Evolution:
- Then fringing reef, & barrier reef should not be found on either side of the same island, at the same level.
- The subsidence theory most of the accepted in Pacific ocean island.



b) **Stand still Theory of 'MURRAY':**
- murray theory formation in 1880 on the basis of the information recived during the challenger expedition.
- Theories based on the concept of non-subsidence or stand still situation of land in two categories:
  ① first group coral grow upon suitable stable submarine platforms with unchanging sea level.
  ② second group necessary suitable submarine platforms become available due to lowering of sea level.
and consequent erosion of land by seawaves but the land always remains stable.

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- The Theory of Murray belongs to the first group:
- According to him coral polyps can live up to the depth of 30 fathom.
- The height is increased due to deposition of marine sediments. After getting suitable foundation at required depth of 180 feet coral polyps begin to grow upward along the coasts & fringing reef is formed.

- The coral polyps after some time also grow outward on the foundatn of their own debris, Thus the continiously outward growing fringing reef is transformed into barrier reef.

- The lagoon is formed betn the land & barrier reef because of dissolution of dead corals. Atolls are formed due to outward growth of corals in all directions at the top of submarine platforms.

* Evolution -

(i) A limit of 30 fathoms for deposition & erosion can not be accepted.
(ii) The lagoon is formed due to solution of dead corals, this mechanism is doubtfull.

c) **Glacial control Theory of 'DALY':**

- Daly propounded his theory of coral formation in yrs 1915.
- According to him sealevel fell by 33 to 38 fathoms due to glaciation during pleistocene Ice Age.
- The existing of corals died due to lowering of temp. of marine water.
- wave-cut platforms are formed along continental coasts & islands due to abrasion by a sea waves.

- After the end of ice age the sealevel again rose by 33 to 38 fathom due to ice melt due to rise of temprature and wave cut platformed submerged under sea water.
- The corals which could survive during the glacial period & new coral polyps began to grow & establish their colonies on the seaward edges of submerged platforms.

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- Thus fringing reefs were formed on narrow wave-cut platforms while barrier reefs were formed on broad-eroded platform.
- Atolls are formed around isolated wave-eroded island peaks.

d) **Concept of W.M. Davis:**

- W.M. Davis postulated his concept of the origin of coral reefs in (1914-18) and revived the subsidence theory by Darwin.
- According to him corals grow along the subsiding land.
- "The flatness of bottoms of lagoons & their uniform depth are not due to uniform lowering of sealevel."
- The shallowness of lagoons is because of deposition of debris.
- The deposition of marine sediments would fill up the lagoons & the overflowing of water would kill the living corals on the seaward side of the reefs."

Coral Bleaching:

- "Coral bleaching refers to loss of algae from the corals resulting in to the 'white colour' which is indicative of death of corals."
- Global warming has been reported as the major factor of coral bleaching.
- Though coral bleaching was observed by "Alfred Mayer" as back as 1919. But it was the year 1998 when large scale coral bleaching accounting for 70%.
- The coasts of Kenya, Maldives, Andman & Lakshwadeep islands in the Indian ocean.

* Factors affecting on coral bleaching -

① Global warming - just 1°C higher than normal during the warmest summer month.

② El-Nino - the phenumenal increase in coral bleaching in the years 1983, 1987, & 1998 also associated with El-Nino.

③ Coral diseases - e.g. coral plague, black band & aspergallios etc.

④ Local factors - sedimentation, sea water pollution, urban sewage, clearing of marine forest etc.

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OCEAN DEPOSITS:

"The unconsolidated layer of sediments commonly known as marine deposits".

- It is the outcome of deposition of sediments due to continious wearing of rocks along the with other materials such as plants, animals etc. on the ocean floor.
- 'Herodotus' first person to give some idea of deposits.
'John Murry' submited detailed information of ocean deposits in 1894.

Classification of Deposits:

- On the basis of origin the oceanic deposits are divided into two broad classes ⓐ Terrigeneous ⓑ Pelagic

a) Terrigeneous Deposits:

'The continental rocks are disintegrated and decomposed due to various type of weathering and thus fine to coarse sediments are formed'.

- These sediments of continental origin are called terrigeneous matarials. _ Latin word.
- 'Terra geneous' means Tera meanig 'land' & geaneous meaning 'born'
- The depposits are derived from land are brought to the ocean floor by rivers, glaciers, winds and sea waves.

1) Gravel -

- The diametor of gravels ranges from 2mm to 256 mm.
- These sediments are very large in size are deposited on the continental shelves.
- Sub types: Boulders (256mm), cobbles (64mm), pebbles (4mm) and Grannules (2mm).

2) Sands -

- It's diametor as 1 mm to 1/16 mm are termed sands.
- five types ① very coarse sands (1mm) ⑪ coarse sand (0.5mm) ⑫ medium sands (0.25mm). ⑬ fine sands (0.125mm)

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3) Silt, clay, mud:

- It's rainging in diameter from 1/32 mm to 1/8192 mm are grouped
- The category silt, clay & mud silt - 1/32 mm, clay - 1/256 mm and mud - 1/8192 mm.
- clay is significant cementing element.
- clay & mud are deposited in calm seawater.

* Murry has divided mud into three types:

(i) Blue mud-

iron sulphide

- It include materials the disintegration of rocks rich in iorn sulphide and organic elements.
- These are generally found in greater depth of continental shelves.
- The original colour Blue & it contain 35% calcium carbonate.
- Blue mud predominant in the Atlantic ocean, Mediterinian Sea and Arctic sea etc.

(ii) Red mud:

iron oxide

- The sediment derived through rich in iron oxides (FeO).
- It contains 32% calcium carbonate.
- found in Yellow Sea, Brazilian coast, & Atlantic ocean.

(iii) Green Mud-

Glauconite, silicates

- It is formed due to chemical weathering where in the colour of blue mud is changed to green mud due to reaction of sea water.
- It contains green silicates, of potassium & gluconite whereas calcium carbonate ranges from 0 to 56 percent.
- It found Atlantic & pacific coast of N. America, coast of Japan, Australia & Africa.

(iv) Volcanic mud-

- These mud comes from volcanic eruption on the land and oceans.
- Volcanic materials resemble blue mud & are gray to black in colour.
- It is found in shallow sea near volcanic islands.

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b) Pelagic Deposits:

- The word Pelagic is derived from German word 'Pelagois' which means 'sea'.
- Pelagic deposits are obtained from the sea water and are deposited ocean floor i.e. deep plain, continental shelves & slope.
- These are two types; on the basis of materials -

1) Organic Deposits:

- Organic deposits contains of fauna & flora.
- The continental shelves found both animal skeleton & plant leaves & shells.
- They are not found at greater depth due to shortage of food & light.
- The organic deposits are of fine particles which known as 'Oozes'.

* which are divided into two groups on the basis of lime & silica -

① Calcareous oozes -

- It is more content of lime and are found in greater depth because their high degree of solublity.
- They are generally found 1000 to 2000 fathoms.
- Calcarious oozes further divided in to two types:

ⓐ Peteropod ooze -

most of the peteropod oozes are formed of peteropod molluscs having thin shells of conical shape with avarage diameter of half inch.

- It contains 80'/. calcium carbonate & mostly found tropical areas, at the depth 900-1000 fathum.
- It is mostly found in coral region. i.e. Azores, Cannary islands, Antiles & Indian ocean.

ⓑ Globigerina ooze -

This ooze is formed from the shells of a variety of forminfera and germ are called 'globigering'.

- This deposits it becomes dirty dried powder.
- The chemical composition 64.46'/. calcium, 1.64'/. silica & 3.93'/. minerals.
- It's found tropical & temprate zones of the Atlantic ocean, Indian orean east & west continental shelves.
- It is generally found bein the depth of 2000 to 4000 fathom.

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(ii) Siliceous Ooze - 'maximum amount of marine deposits'.
- When silica content dominates, the ooze siliceous in nature.
- Silica is derived from a group of protozoa or radiolarians and benthic animals.
- Such ooze are found in both warm & cold water at greter depths.
* On the basis of perticular organism two subtypes -

(a) Radiolarian ooze -
- It is formed by the shells of radiolaria & forminfera.
- This ooze found up to depth of 2000 to 5000 fathoms.
- It covers the largest areas in the Pacific Ocean.

(b) Diatom ooze -
- It is formed of the shells of very microscopic plants containing silica in aboundance, it also contains some clay.
- Calcium content varies from 3 to 30 %, it becomes fine coherent white powder when dried.
- These are found in zone around Antartica, & Belt of Alaska to Japan in the N. Pacific.

2) Inorganic Deposits :
- majority of inorganic material fall down above by precipitation. These elements fall on the land as well as oceans.
- These inogranic precipitates includes dolomite, amorphous silica, iron, maganese oxide, phosphate, brite etc.
Besides, gluconite, phosphrite, phillipsite & clay.

(i) Red clay -
- Red clay is the most widely spread all the 'Pelagic deposits'.
- It composition it is a true clay, hydrated silicate of aluminium coloured by oxide of iorn.

(ii) Meteoric Dust -
- The Ash produced by the burning of the 'meteroes'.
- It consits of meteoric dust coming from space recognise as 'cosmic spherules'.

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* Distribution of ocean deposits :

ⓐ Vertical distribution of Deposits :

- F.J. Mankhouse : has devided the ocean deposit into following on the basis of depth of which they are formed.

Depth in feet

0 - 6000	-	90%.	pteropod ooze $CaCO_3$
6000 - 12000	-	20%.	globigerina ooze 20%. $CaCO_3$.
12000 - 18000	-	1%.	red clay $CaCO_3$

ⓑ Horizantal distribution -

i) Pacific ocean :

- Rank Ist in area under pelagic deposit.

Red clay - maximum (70.3)
Globigerina - medium (51.9)
Diatom - low (14.4)
Radiolarian - very low (6.6)
} (143.2) - found only pacific
Petrepod - Absence

ii) Indian ocean - 2nd rank in pelagic

Globigerinia - max (34.4)
Red clay - medium (16.0)
Diatom - low (0.12)
} 63.3

iii) Atlantic ocean :

Globigernia - max (40.1)
Red clay - medium (15.9)
Diatom - low (4.1)
Pteropod - very low (1.5) - found only Atlantic
Radiolarian - absence

* Largest Islands of :

- Japan - Honshu
- India - middle Andman
- Indian ocean - Madagascar
- Philipines - Luzon
- Indonesia - Boreno
- Oceania - New Guinea
- Caribbean - Cuba

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Longest Coastline:

1. Canada
2. Norway
3. Indonesia
4. Russia
5. Philippines
6. Japan
7. Australia
8. U.S.A.
9. Newzeland
10. Greece
11. China.

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TEMPRATURE OF THE OCEAN WATER:

- The temp. of the oceanic water is important for marine organisms including plants and animals.
- The temp. of sea water also affect the climate of coastal lands and plants and animals theirin.
- These 'thermaimeters record the temp. upto the accuracy of ±0.02°c.

* Source of Heat energy in ocean mostly 'sun' and latter internal heat of the earth.

① Solar radiation:

The major source of temp. of the oceanic water is sun. The radient energy transmited from the photosphere of the sun is emr shortwaves & recived at the ocean surface is called insolation.

② Internal Heat of the earth -

Some energy through insignificant is also recived from below the bottom & through the compresion of sea water.

* Daily range of Temprature:

'The difference of maximum & minimum temp of a day (24hr.) is known as daily range of temperature.'

- The daily range of temp. of surface water of the oceans is almost insignificant it is around 1°c only
- The daily range of temp. is usually 0.3°c in the low latitudes and 0.2°c to 0.3°c in high latitudes.
- The maximum & minimum temp. of sea surface water are recorded at 2 p.m. & 5 A.m. respectively.
- Thermameters record the temp. up to the accuracy ± 0.2° centigrade.

Annual range of Temprature -

- The maximum & minimum annual temp. of ocean water are recorded in August and febravary respectively, avarge temp. -12°c (10°f)

①	At equator - 2.3°c	⑯	30° lat. - 5.9°c
⑪	10° lat. - 2.4°c	⑰	40° lat. - 7.5°c
⑬	20° lat. - 3.6°c	⑱	60° lat. - 5.6°c

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Distribution of Temprature:

- The distribution of temprature in two ways:
  ① Horizantal ② vertical.

* Factors affect the distribution of temp. of ocean water:
  - I) Latitudes.
  - II) Unequal distribution of land & water.
  - III) Prevailing winds.
  - IV) Ocean current
  - V) Minor factor - submarine ridge, local weather i.e. cyclones, fog, evaporation, and location & shape of sea.

1) Horizantal Distribution of Temprature:

Net per. 2012

- The avarage temp. of surface water of the oceans is 26.7°c (80°F). and temp. gradually decreases from equator toward the poles.

- The rate of temprature decreses with increasing latitudes is generally 0.5° F. per latitude.
- The avarage temp. 20° latitude - 22°c
  40° latitude - 14°c
  90° latitude - 0°c.

- The ocean of the norther hemisphere record relatively higher temp. than southern hemisphere.
- The high temp. recorded not at the equator it is a bit north of it.
- The avarage annual temp. of all the oceans 17.2°c.
  ① norther hemi. avarage temp - 19.4°c.
  ② southern hemi. avarage temp. - 16.1°c.
- The variation of temp. in N. & S. hemisphere, Because of unequal distribution of land & water.

Atlantic Oceans:

- The decresses of temp. with increasing latitudes in the northern Atlantic Ocean is very low because of warm ocean current

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- The avarage temp. bet 50°-70° N latitudes is recorded at 5°c.
- The decrease of temp. with increasing latitudes is more pronounced in the southern Atlantic ocean.

Pasific Ocean -

- The avarage annual temp. of the Pacific Ocean is slightly higher than the Atlantic ocean 16.9°c.
- The highest temp. 32.2°c recorded western pacific ocean and lowest temp. 3.3°c recorded near New scottland.

Indian Ocean -

- Indian ocean recorded highest temp. in 'Arabian sea' and 'Bay of Bengol' record lowest temprature.

- The avarage highest temp. of surface water of the oceans is at 5°N latitude whereas the lowest temp. bet^n 80°N and north pole. and bet^n 75°S & the south pole'.

Vertical Distribution of Temprature :

- The maximum temp. of the oceans is always at their surface because it directly recive the insolation.
- The solar rays very effectively penetrate up to 20 m depth & they seldom go beyond 200 m depth.
- The temp. decreases from the ocean surface with increasing depth but it is not uniform everywhere.
- The temp. falls very rapidly up to the depth of 200 m & thereafter the rate of decreases temp. is slowed down.

* The oceans are vertically divided into two zones:

(i) Photic or euphotic zone - (sea level - 200 m)
represents the upper surface up to the depth of 200 m & recives solar radiation.

(ii) Aphotic zones - (200 m - below)
extends from 200 m depth to bottom & does not recive solar radiations.

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1. The sea temp. decreases with increasing depth but the rate of decreases of temp. not uniform.

Depth in (fathom)	Temp. (°F)	Temp. °c
100	60.7	16°c
200	50.1	10°c
500	45.1	7.2°c
1000	36.5	2.5°c
1500	35.5	1.9°c
2200	35.2	1.7°c

2. Diurnal & annual range of temp. cease after the depth of 5 fathom & 100 fathom respectively.

3. The rate of decrease of temp. with increasing depth from equator towards the poles is not uniform.
The rate of decrease of temp. with increasing depth is more rapid near the 'equator' than towards the poles.

4. Some areas high temp. is recorded at greater depth.
e.g. Sargasso sea, Red Sea, Mediterranean sea, Sulu sea etc.
- Such anomalous conditions are noticed in enclosed seas, of low lattitudes.

5. - The mechanism by which energy of solar origin is transported around the earth is - 'ocean waves.'

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SALINITY:

① 'Salinity is defined as the ratio bet^n the weight of the dissolved materials and the weight of the sample sea water'.

② Salinity is defined as 'the total amount of solid material in grams contained in 1kg of sea water & is expressed as part per thousand. e.g. 30 ‰ means 30 gm of salt in 1000 gm of sea water.

- The oceanic salinity not only affects the marine organism & plants community but it also affect physical properties of ocean such as temprature, density, pressure, waves & currents etc.

* Composition of Sea water:

- Sea water contains a complex solution of several minerals substances in dilute form because it active solvent.

	Salts	Amount (‰)	Percentage
I.	Sodium chloride (NaCl)	27.2	77.8
II.	Magnesium chloride ($MgCl_2$)	3.8	10.9
III.	Magnesium Sulphate ($MgSO_4$)	1.6	4.7
IV.	Calcium sulphate ($CaSO_4$)	1.2	3.6
V.	Potassium sulphate (K_2SO_4)	0.8	2.5
VI.	Calcium carbonate ($CaCO_3$)	0.1	0.3
VII.	Magnesium Bromide ($MgBr_2$)	0.07	0.2

* Sources of Oceanic Salinity -

- The source of oceanic salinity is land, Rivers bring salts in solution form from the continental areas.
- Volcanic ashesh also provide some salts to the oceans.
- Surprisingly there is a lot of variation in the composition of sea salt & riverine salt as calcium ~~carbonate~~ sulphate constitute (60%) of river salinity while sodium chloride dominantes in the oceans.
- River water contains (2%) sodium chloride.
- most of the salt in the sea water is derived from 'continents'.

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June 05

* Controlling factors of salinity:

1) Evaporation -

- Greater the evaporation, higher the salinity & viceversa. Salt concentration increase with rapid rate of evaporation.
- Subtropical region high salinity as compaire equatorial region. Because subtropical area clear sky & high evaporation.

2) Precipitation -

- Higher the precipitation, lower the salinity and vice versa.
- The volume of water in the oceans is increased due to heavy rainfall & thus the ratio of salts to the total volume of water is reduced.

3) Influx of river water:

- The rivers bring salt from the land to the oceans but big and voluminous rivers pour down volume of water salinity reduced.
- Whereas evaporation exceeds the influx of fresh waters of river there is increas in salinity.

4) Atmospheric pressure and wind direction:

- Anticyclonic conditions with stable air & high temprature increase salinity of the surface water of the oceans.
- S.T.H.P belt such as high salinity.
- Winds also helps in the redistribution of salt in the oceans & the seas winds drive away saline water to less saline areas.

5) Circulation of oceanic water -

- Oceanic currents affect the spatial distribution of salinity by mixing seawater.
- Equatorial warm currents drive away salts from the western coastal areas of the continents & accumulates them along the eastern coast.

- The N. hemisphere recorded maximum salinity in June & minimum salinity in December due to evaporational rate.

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Distribution of salinity:

- The avarage salinity in the oceans and the seas is 35‰, but spatially & temporally varies.

1) Horizantal Distribution:

- Horizantal distribution of oceanic salinity is studied in relation to latitudes but regional distribution.
- The spatial pattern of distribution of salinity in enclosed seas, partially enclosed seas & open seas is also considred.

1) Latitudnal Distribution:

- On an avarage salinity decreses from equator towards the poles.
- The equator accounts for only 35‰ salinity.
- The highest salinity is observed betⁿ 20°-40° N (36‰) because this zone is charactrized by high temprature, high evaporation but significantly low rainfall.
- The avarage salinity of 35‰ is recorded betⁿ 10°-30° latitudes in the southern hemisphere.
- The zone betⁿ 40°-60° latitude in both the hemisphere records low salinity whereas it is 31‰ & 33‰ in northern & southern hemisphere.
- Salinity further decreases in the polar zones because of influx of melt water.
- On an avarage Northern hemisphere 34‰ and southern hemisphere 35‰ salinity record.

* Four zones of oceanic salinity:

(I) Equatorial zones of relatively low salinity - due to excesive rainfall.
(II) Tropical zone (20°-30°) of maximum salinity - due to low rainfall and high evaporation.
(III) Temprate zone low salinity.
(IV) subpolar and polar zone of minimum salinity.

latitudnal zones	salinity (‰)	latitudnal zones	salinity ‰
70°-50°N	30-31	20°-30°S	35-36
50-40°N	33-34	30°-50°S	34-35
40-15°N	35-36	50°-70°S	
15-10°N	34.5-35		

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- Marginal areas of oceans have lower salinity than their central part because freshwater added.
- The salinity varies in the open seas according to latitudnal but no control of salinity in inland seas.

iii) Regional distribution of salinity:

Dec 2012

(a) Seas having salinity above normal -
Red sea (34-41‰), Persian Gulf (37-38‰) and Mediterranean sea (37-39‰).

(b) seas having normal salinity -
Carribean sea & Gulf of Mexico - 35-36‰, Bass strait - 35‰ and Gulf of California (25-35.5‰).

(c) Seas having salinity below normal -
Arctic ocean (20-35‰), N. Australian sea (33-34‰), Bering sea (28-33‰), Japan & china sea (25-35‰), Andman sea (30-32‰)

Pacific Ocean:

- There is wide range of salinity differences in the Pacific ocean because of its shape & larger areal extent.
- salinity remains 34.85‰ near equator, 15°-20° latitude - 36‰
- salinity again decreses further northward west pacific 37‰, okhotask sea 34‰.
- salinity also decreses along the California, middle American and Peruvian coasts.
- The south of high salinity zone betn 15°-20°S in the southern Pacific as reffered to above (36‰) it becomes low along the Peruvian & chilean coasts.

Atlantic Ocean:

- The avarage salinity of the Atlantic ocean is 35.67‰
- salinity recorded at 5°N - 34.98‰, 15°N - 36‰ and 15°S - 37.77‰
- maximum salinity of 37‰ in the southern Atlantic is found in a region demarcated by 12°S - 20°S latitude.

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Indian Ocean:

- An average salinity of 35‰ is found betⁿ 0°-10°N but it gradually decreases northward in the Bay of Bengal (33.5‰).
- The Arabian sea records higher salinity (36‰) because higher rate of evaporation.
- The western coast of Australia records higher salinity due to dry weather.

Dec. Nov 2012

* Inland seas and Lakes:

- The amount of salt in the inland seas and lakes is controlled by the rate of evaporation, temprature, influx of river water and the presence & absence of outlets.
- Caspian sea (24‰) is because of addition of enormous volume of water by river like volga & Ural etc.
- Very high salinity is found in Great Salt lake (220‰ Utah USA) ~~Red sea (2400‰)~~, * Lake Van (330‰), Dead Sea (238‰) ~~etc.~~

2) Vertical Distribution:

- No definite the trend of distribution of salinity with depth both the trends of increase & decrease of salinity with increasing depth.

e.g. The Southern boundry of the Atlantic is 33‰ at the surface. but it increases to 34.5‰ at the depth of 200 fathoms. and 600 fathom 34.75‰.

- On the other hand, surface salinity is 37‰ at 20°s latitude but it decreases to 35‰ at greater depth.

* Characteristics:

① Salinity increase with increasing depth in High latitudes i.e. the positive relationship because of denser water below.

② The trend of increase of salinity with increasing depths is confined to 200 fathoms from the surface in middle latitude's beyond which it decrease with increasing depth.

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② Salinity is low at the surface at the equator due to high rainfall and transfer of water through equatorial currents, but higher salinity is noted below the water surface.

③ Maximum salinity is found in the upper layer of the oceanic water. Salinity decreses with increasing depth.

'The upper zone of maximum salinity & the lower zone of minimum salinity is seprate.

* DENSITY of Sea Water:

- Due to presence of salt and other substances the density of seawater ranges from 1.027 to 1.028.
- Temp. and salinity both affect density of water, Thus such factor which influence on temp. & salinity also affect on density of water.
- The ocean current are mainly responcible for the causing differences in density of water.
- If the water of upper layer is denser than that at lower layer, the denser was has tendancy to subside.

• Meaning - 'The density of any substance is the mass (weight) per unit volume'.

* Factors controlling Density:

1) Temprature-

Cold water more denser than warm water. i.e Higher the temp. lower the density.

2) Salinity -

- High salinity creat high density, but warm water with high salinity creat low density.

3) Compressibility - (Due to Air pressure):

- Air pressure also represent the density of oceanic water.
- Higher the Air pressure, higher will be density & vice versa.

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4) Convectional activity -
- convectional activity start in ocean due to differences in temp. & salinity. It creats convergence & divergence movment in the ocean.
- Density is maximum in convergence area and minimum in divergence area.

5) Influx of fresh water decrease the density.

* Vertical Distribution of Density:
- Generally at surface water of low density found it increase toward the bottom.
- Low dense water sunkdown the surface up to the depth ; where water of similar density is found. Hence at places of convergence dense water may sink below the lighter one & form dense bottom water.
- surface current from equator to pole & there is bottom current from the pole toward the equator which bring denser water in this area.

Horizantal Distribution:
- The horizantal distribution of density is largely depend on distribution of precipitation, salinity & temprature.

- At equator - Here low density at the surface and high on bottom because high temp. & high rainfall.

- At higher latitudes - Density of surface water is maximum because high salinity.

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Relationship Between Density, Temperature and Salinity :

- Density of seawater and temprature are inversely proportional i.e. if temprature of sea water increases, its density decreses and vice versa.
- It is fig. that temp. of seawater sharpley declines from 200m depth to 1000m depth in low latitudes areas and thereafter there is no variation in seawater temprature with increasing depth (curve 'A').

- On the other hand, there is no change is sea water temp. with increasing depth in high latitude (curve 'B').

* Thermocline -

The zone of sharp change of seawater temp. (decreases temp. with increasing depth) betⁿ 200m to 1000m is called as "Thermocline".

- Contrary to seawater temp-, the density of seawater increases sharply with increasing depth betⁿ 200m to 1000m in low latitudes areas (curve 'A').

But high latitude areas (polar) there is no change in sea water density.

* Pycnocline :

This zone of 200m to 1000m depth characterized by sharp change in density of sea water

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* Salinity -

- Average salinity of the sea water - 35 ‰
  - i) Atlantic ocean - 35.67 ‰
  - ii) Pacific ocean - 34.85 ‰
  - iii) Indian ocean. - 35. ‰
- Maximum salinity occurs betⁿ - 20°-40°N & 10°-30°S
- The highest salinity is found - The Lake Van (330‰)

* Temprature -

- Avarage annual temp. of oceans - 17.2°C
  - i) Pacific - 19.10°C
  - ii) Indian - 17.00°C
  - iii) Atlantic - 16.91°C
- Avarage temp. of surface water - 26.7°C

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OCEAN TIDES:

- waves, currents and tides of vital significance among various types of oceanic movements.

"The rise and fall of seawater due to gravitational force (centripetal) of the sun and moon are called Tides."

The sea waves are generated by tides are called tidalwaves.

High tide water -

"The rise of sea water and its movment towards the coast is called tide and the resultant high water level is known as high tide water".

Low Tide water -

The fall of sea water and its movment towards the sea is called as 'ebb' and resultant low water level is called low tide water.

"The difference betn High Tidal water and Low Tidal water is called Tidal range".

- In open ocean the difference betn High tide and Low tide height is: 0.5 meters.

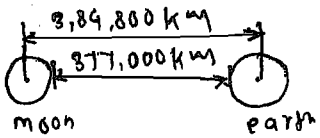
* Origin of Tides:

- The origin of tides in the oceans is primarily concerned with
(i) The gravitational forces of the sun and the moon.
(ii) The earth rotates from west to east & revolves around the sun.
(iii) The moon rotate from west to east & revolves around the earth.
(iv) The distance betn the moon and the earth changes during different times in every month.

Apogee - "The period of the farthest distance betn the moon and the earth (406,000 km) is called apogee".

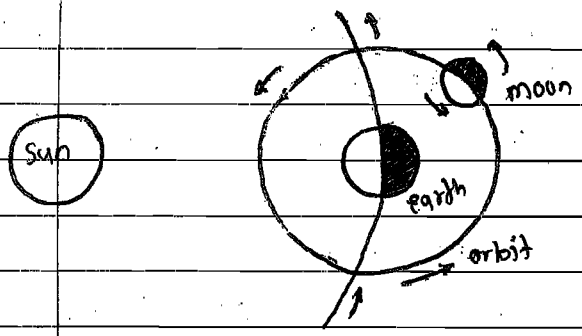
Perigee - The period of the nearest distance (356,000 km) is called Perigee.

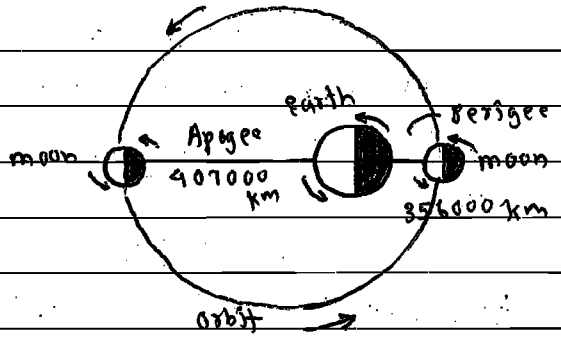
- average distance of moon & earth - 381,500 km



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- The earth diameter of 12,800 km is 6,400 km nearer to the moon than its centre.
- The centre of the moon is 3,84,800 km away from the centre of the earth.
- The earths outer surface is 377,000 km away from the outer surface of moon.





- The gravitational force of the moon will be maximum at the earth's surface facing the moon while it will be minimum at the opposite side of the earth.
- The water earth surface facing the moon is attracted and pulled & high tide occurs.
- High tide also occur at the opposite side of the earth simultaneously because of the reactionary force (centrifugal) of the gravitational (centripetal) force of the moon causing outward bulge of water.

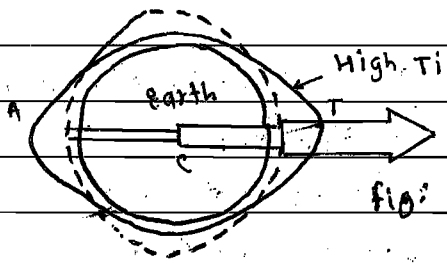


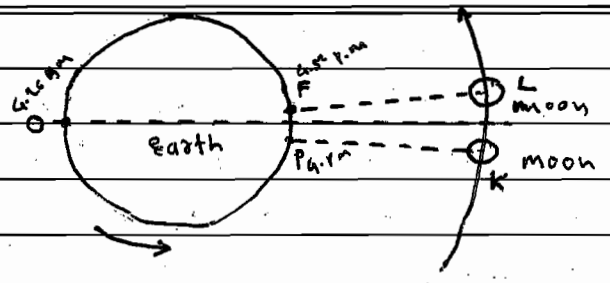
fig: Effects of gravitational force of moon on earth's water surface and occurance of high & low tide.

* Times of Tides:

- Every place exprience tides twice a day after 12 hours.
- Each day tide is delayed by 26 minutes because the moon revolving around the earth.
- Thus, a particular tide centre takes 24 hours 52 minutes to come under the moon but by that time there is another tide at the opposite side of the referred tide centre & this happens after 12 hr. 26 min.

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- Suppose if 'P' experiences first tide at 4 P.M. the second tide will occur at 4.26 A.M. and next tide will be experienced at 4.52 P.M. (1st place)
- The place 'P' after rotation (24hr.) moves 'K' moon location to 'L' moon position, which is 'F' place on the earth surface.
- The earth has to spend 52 minutes to cover P-F distance.

- The moon completes its one revolution around the earth in 27 days, 7 hr., 43 min & 11.5 sec. (average 27.5 days).
- Each place every day tide occurs after 12 hr. & 26 min. and after tide, ebb occurs after 6 hr. 13 min.

TYPES of Tides:

1) Spring Tide-

"Very high tide is caused when the sun, the moon & the earth are almost in the same line, such high tides are called spring tides."

- The position of the sun, the moon and the earth in a straight line is called syzygy.
- When the sun, the moon & the earth are in a position of a right angle this position is called quadrature.
- The sun, the moon are in a position one side of earth are called conjuction (solar eclipse). (Lunar)
- The position of the earth bet^n sun & moon is called opposition.
- The height of such spring tides 20% more than normal tides.
- Such tides occur twice every month during full & new moon.

2) Neap Tides-

"The sun, the earth & the moon come in position of quadrature on 7th & 8th day of every fortnight of month. which is lower a height in normal tide, is called neap tide".

- The height of neap tide is generally 20% lower than normal tides.

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3) Tropical & Equatorial Tides -

- Like the sun there is also northward & southward position of the moon in relation to the equator of the earth.
- 'The tides occuring along the tropic of cancer & capricorn are called Tropical cyclones'.

- 'There is diurnal inequality of tides in terms of heights of two neap tides & two spring tides because the moon is vertical on the equator every month. Such tides are called equatorial tides'.

4) Apogean and Perigean Tides -

① Perigen Tides -

'The nearest position of the moon with the earth (3,56,000km) the tidal force most powerfull during this position high tides are caused, such tides called Perigean tides'.

② Apogean Tides -

'The moon is farthest distance (4,07,000 km) from the earth & hence low tides is caused, such tides called Apogen tides.

5) Semi-diurnal and Diurnal Tides -

- The tides occurring at the interval of 24 hr. 52 min. daily are called diurnal or daily tides.
- The tides occurring at the interval 12 hr. 26 min. are called semi-diurnal tides.

6) Equinoctical Spring Tide -

- The tides occuring at an interval 6 months due to the revolution of the earth around the sun and sun's varying declinations are called equinoctical tides.

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THEORIES of the Origin of Tides:

- These theories include:
  1) Equilibrium Theory - Issac Newton (1687)
  2) Dynamic Theory - Laplace (1755)
  3) Progressive wave Theory - William Whewell (1833).
  4) Canal Theory - G.B. Airy (1842).
  5) Stationary wave Theory - R.A. Harris.

1) Equilibrium Theory:

- Sir Issac Newton propounded his theory of gravitation in his Principia in the year 1687.
- 'He stated every celestial body of the universe process gravitational force. The celestial bodies attract each other through their gravitational force in such a way that they remain in equilibrium'
- eg. The sun, the earth & the moon also in equilibrium, due to their respective pull towards each other.

- The earth & the moon while attracting each other revolve around their common centre of gravity & thus two types of force are produced.
  (i) Centrifugal force - work outward from the centre.
  (ii) Centripetal force - work towards the centre.

- The centrifugal force of the moon is greater than the attractive force at the opposite side of the surface of the earth and thus a bulge of water is caused.
- There are two tides on the earth's water surface at the same time, one is caused due to gravitational force (centripetal) being greater than the centrifugal (outward) force being greater than the gravitational force so that both may balance each other.

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3) Tropical

- Like

q -

well in 1883.

of such tidal waves become tides and ebbs

originated in the oceans under the influence of the moon.

- The velocity of tidal waves depend on the depth of seas & oceans.
- The tidal waves would travel freely from east to west.

- Tidal waves are generated in the southern ocean in the southern hemisphere under the influence of tide-producing force of the moon.
- These waves are called 'primary waves' which move from east to west in the form of 'forced waves'
- 'secondary waves' are generated when the westward movment of primary waves is obstructed by land masses, or 'derived waves'. Further minor waves are generated from the secondary waves.

- These secondry & minor waves progressively move northward though there is gradual decrese in their magnitude & amplitude but these generate tides everywhere.

3) Stationary Wave Theory -

- 'R.A. Harris' propounded the concept of stationary waves as opposed to the progressive waves.
- Harris tide phenomena are due to stationary phenomenon waves which originate independently in each ocean.

* The stationary wave theory can be explained with the help of an exprjment -

- If a rectangular tank or 'developing tray' containing water ~~tray~~ is rocked from one side to the other or is simply tilted, the water level rises along one side of the tray but falls along the other side.

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2) Progressive Wave Theory -

- William Whewell in 1883.

- The crests & troughs of such tidal waves become tides and ebbs respectively.
- These waves are originated in the oceans under the influence of tidal force of the moon.
- The length & velocity of tidal waves depend on the depth of seas & oceans.
- The tidal waves would travel freely from east to west.

- Tidal waves are generated in the southern ocean in the southern hemisphere under the influence of tide-producing force of the moon.
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- If a rectangular tank or 'developing tray' containing water ~~tray~~ is rocked from one side to the other or is simply tilted, the water level rises along one side of the tray but falls along the other side.

- This generate oscillations in the water are called stationary waves.
- The oceanic water remains calm & stationary at these points whereas water level changes around them. Such oscillatory mechanism of water occurs in every ocean & is collectively called as **'oscillation system'**.

- The oscillation system & mechanism are affected by the depth, configuration & length of the ocean basins & the rotational speed of the earth.
- There is +ve correlation bet^n the depth of the oceans & the and height of the tides.

* Importance of Tides:

(i) Some harbours are not deep, depth increase during the tide which facilitate entry of large ship.
(ii) Hydro-electricity can be generated.
(iii) Tide help in cleaning the rubbish post.
(iv) Tide help in preserving from freezing of the coast.
(v) Tide bring sea product e.g. shell.
(vi) They also carry the sediment brought by river.

* Tidal facts:

i) - Highest tidal amplitude & range - Bay of fundy.
- Highest tides recorded in India - Okha (Gujrat).

ii) - It takes 24 hr. & 52 min. for rotating earth to bring the same meridian vertically below the moon everyday.
Hence, tides occurs at regular intervals of 12 hr. & 26 min.

iii) - Generally, tides occurs twice a day,
But 'Southampton' along the southern coast of England, exprience tides 4 times a day.

- OTEC : ocean thermal energy convertion
- world 1st tidal power plant 'Rance' (france).

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* Ocean waves : ~~Tides~~

i. Waves are given rhythm to the ocean.
ii. They transport energy over vast distances.
iii. ocean waves are important part of understanding the coastal habitats they influence.
iv. There are three types : wind driven waves, tidal waves, & tsunamis.

* Ocean tides -

'Tides are the rise & fall of sea levels caused by the combined effects of the gravitational forces exterted by the moon, the sun and the rotation of the earth'.

- The moon exerts the strongest influence on tides as compared to the sun ;
Because the moon is relatively closer to the earth as compare to the sun.

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* OCEAN CURRENTS :

"The general movment of a mass of oceanic water in a definite direction is called **ocean current**".
which is more or less similar to water streams on land surface.

- Ocean currents are divided on the basis of temprature into -
  - (i) warm current
  - (ii) cold current.
- On the basis of velocity, dimension and direction -
  - (i) Drift (ii) Currents (iii) streams.

(i) **Drift** - 'The forward movment of surface water of the oceans under the influence of prevailing winds'.

(ii) **Current** - 'The ocean current involves the movment of oceanic water in a definate direction with greater velocity'.

(iii) **Streams** - 'Ocean stream involves movment of larger mass of ocean water like big rivers of the continents in a definite direction with greater velocity than the drift & currents'.

* Origin of currents :

1) Factors related to ocean current of Rotation of the Earth :
- The rotation of the earth on its axis from west to east results in the genesis of deflective force or 'coriolis force'.
- The rotational force of the earth causes movments of ocean water near the equator in opposite direction to 'the west to east rotation' & thus equatorial current are generated.
  This current flow from east to west.
- Some ocean water moves in the direction of the rotation of the earth i.e. from west to east and thus counter equatorial current are formed,
- The convergence of ocean currents takes place in : Equatorial region.

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2) Factors related to the Oceans:

(i) Temprature Differences -

- Temprature decreases from equator towards the poles. Due to high temp. in the equatorial region the water density decreases because of greater expansion of water particles where as the density of sea water becomes comparitively greater in the polar areas.
- Water moves to equatorial region (of higher temp.) to polar areas (colder areas).

(ii) Salinity Differences -

- Oceanic salinity affects the density of ocean water & density variation eause ocean currents.
- Ocean current on the water surface are generated from the areas of less salinity to the areas of greater salinity.
- Surface & subsurface currents caused by salinity variation is originated in open & enclosed sea.

(iii) Density Differences -

- water density depend on temprature, salinity and pressure of oceanic water.
- As a rule, water moves from the areas of lower density areas to higher density areas.
- The density variation caused by temp. & salinity and resultant movment of oceanic water as ocean current.

3) factors Related to Atmosphere -

(i) Air pressure and winds:

- The areas of high atmospheric pressure are charactrized by low volume of water & lower water level. Contrary low atmospheric pressur record higher volume of water level.
- Thus water moves as areas of higher water level to low water level areas.

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- Planetary winds play major roles in the origin of ocean currents. The wind blowing on the water surface also moves water in its direction due to its friction with the water.

(ii) Rainfall and Evaporation -

- The sea water level becomes relatively higher in the areas of low evaporation & high rainfall and viceversa.
- Sea water level becomes lower in the areas of high evaporation and low rainfall.
- Surface ocean current are generated from the areas of high water level to areas of low water level.

4) Factors Modifying ocean currents -

(i) Direction, shape & configuration of coastal line -

- The deposition of coast line perpandicular to the natural flow direction of ocean currents start flowing parallel to the coastline.

e.g. Equatorial current obstructed by Brazilian coast.

(ii) Bottom Relief -

- The irregularities of the bottom reliefs of the oceans modify the ocean currents.
- Ocean current follow to the high latitude in the low lattitude.
- The submarine ridges usually deflect the course of current.

(iii) Seasonal Varriation -

- There is seasonal change in the directions of currents in some areas in responce to seasonal change in weather conditions.

e.g - Monsoon climate as the currents of Indian ocean.

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Currents Of The Atlantic Oceans :

1) North Equatorial Current (warm) -

- The north equatorial current is formed betⁿ the equator & 10°N latitude.
- This current is generated cold water near the west coast of Africa. This warm current pushed westward by the cold canarry current.
- This current of the east coast of Brazil bifurcated in to two branches:
  - (i) Antilles current - flows to the east coast of west Indies islands & helps formation of 'sargasso sea'.
  - (ii) Caribbean current - enters the Gulf of Mexico & becomes Gulf stream.

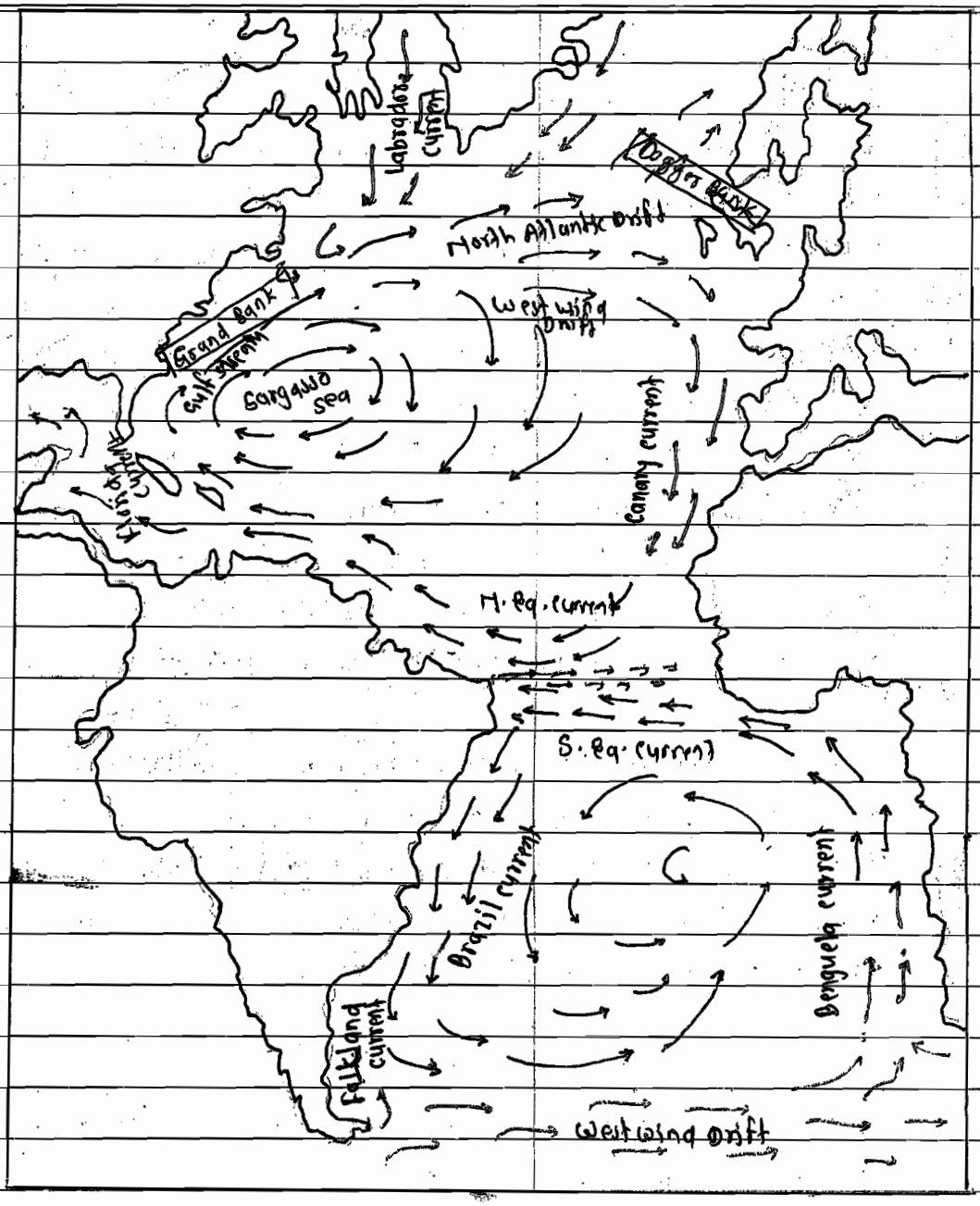
2) South Equatorial Current (warm) -

- S. Equatorial current flows from the western coast of Africa to the eastern coast of south America betⁿ equator to 20°S latitude.
- This current are more constant, stronger & greater extent than the north equatorial current.
- This current is basically originated under the stress of trade winds.
- This current bifurcated in to two branches:
  - (i) Northward branch merges N.E. current near Trinidad.
  - (ii) Southward branch continious to Brazil warm current.

3) Counter Equatorial current (warm) -

- The counter equatorial current flows from west to east betⁿ north & south equatorial current.
- The counter current mixes with the equatorial currents in the west it is more developed in the east is known as Guinea stream.
- This current is originated because of the influence of equatorial westerlies, which blow from west to east in the calm zone of 'doldrum'.
- The pillin up of water raises the water level & hence water flows eastward as compensation current up to the Gulf of Guinea.
- The N. eq. current in northern & S. eq. current in the southern ocean are caused by : coriolis force.

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4) Gulf Stream:

- This current system originates in the Gulf of Mexico around 20°N latitude & moves in NE direction along the eastern coast of N. America and reaches the western coasts of Europe at 70°N latitude.

① Florida Current -

- This current flows through Yucatan channel into the Gulf of Mexico, thereafter the current moves forward through Florida Strait & 30°N latitude.
- Florida warm current temprature of 24°c, salinity 36‰.
- The origin of Florida current is attributed to the piling up of immense volume of water in the Gulf of Mexico due to powerful trade wind.

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(ii) Gulf Stream

- The Florida current after having the water of Antilles current is known as Gulf stream beyond cape Hatters.
- The temp. ranges betⁿ 4° to 10°c, This zone of cold water betⁿ the coast & Gulf stream is called 'cold wall'.

(iii) North Atlantic Current -

- The Gulf stream is divided into many branches at 45° N latitude and 45° W longitude. All the branches are collectively called as North Atlantic Drift or current.
- There are mainly two branches;
  - (A) North eastern branch moves north eastward.
  - (B) Eastern branch comparitively warmer than northern branch.

- The Gulf stream large modified weather condition of eastern coast of USA & western coast of Europe.
- The convergence of Gulf stream & cold Labrador current near Newfoundland causes inversion of temprature, which is result in the formation of fog.

5) Canary Current (cold) -

- This current flows along the western coast of north African coast betⁿ Maderia & cape Verde.
- This current is the continuation of N. Atlantic Drift which turns southward near the spanish coast & flows to the south along the Canary Islands.
- The avarage velocity of this current 8 to 30 nautical miles / day.
- This current brings cold water of the high latitudes to the warm water of the low latitudes & finally merges with north equatorial current.

6) Labrador Current (cold) -

- This current originates in the Baffin Bay & Davis strait and after flowing through the coastal waters of Newfoundland and Grand Bank merges with the Gulf stream. (50°W).
- This current brings with it a large no. of big icebergs as far south as Newfoundland & Grand Bank, and

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7) Brazil Current - (warm)
- Brazil current is characterized by high temp. and high salinity.
- This current is generated south equatorial current flows southward along the east coast of S. America upto 40°S latitude.
- The Falkland current (cold) coming from the south merges with the Brazil current near 40° S latitude.

8) Falkland current (cold) -
- The cold water of the Antarctic sea flows in the form of Falkland cold current from south to north along the eastern coast of South America.
- This current becomes most extensive & developed near 30° S latitude.
- This current also brings numerous icebergs from the Antarctic area, to the S-America coast.

9) South America Drift (cold) -
- The eastward continuation of the Brazil current is called South Atlantic Drift.
- The south Atlantic Drift, thus flows eastward under the influence of the westerlies.
- This current is also known as the westerlies Drift.

10) Benguela current - (cold)
- This current flows from south to north along the western coast of south Africa.
- The south Atlantic Drift turns northward due to obstruction caused by the southern tip of Africa.
- This current merges with the south equatorial current.

• Sargasso Sea:
- There is a anticyclonic circulation of N. equatorial current, Gulf stream & Cannary current in the North Atlantic Ocean.
- 'The water confined calm & motionless is said Sargasso sea'.
- The sargasso sea is found bet^n 20°-40° N latitudes and 35°-75° W longitude.
- The sea record salinity 37‰, temp. 28°C.

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✱ Currents of The Pacific Ocean:

1) North Equatorial Current (warm) -

- The north equatorial current originates off the western coast of Mexico & flows in westerly direction & reaches Philippines coast.
- This current originated because of the Californian current and north-east monsoon.
- A few branches also comes out of the main current & turn north & south-
  - (i) One branch emerges from the to join kuroshio current.
  - (ii) southern branch turned eastward to form counter equatorial current.
- The velocity of the current ranges betⁿ 12 to 18 nuchical miles per day.

2) South Equatorial Current - (warm):

- This current originated due to the influence of SE trade winds and flows from east to west.
- This current stronger than N. equi. current and avarage velocity 20 nautical miles a day.
- The current is bifurcated into northern & southern branches near New Guinea.
- The norther branch turns eastward & flows are equatorial counter current while the southern branch moves towards the N & NE coasts of Australia.

3) Counter Equatorial Current (warm) -

- The current flows from west to east betⁿ the north & south equatorial current.
- This counter equatorial current is extended up to the Panama Bay.
- The avarage temprature are 27.5°C and salinity 34.5‰.
- The current transports oceanic water at the rate of 25 million m^3/sec.

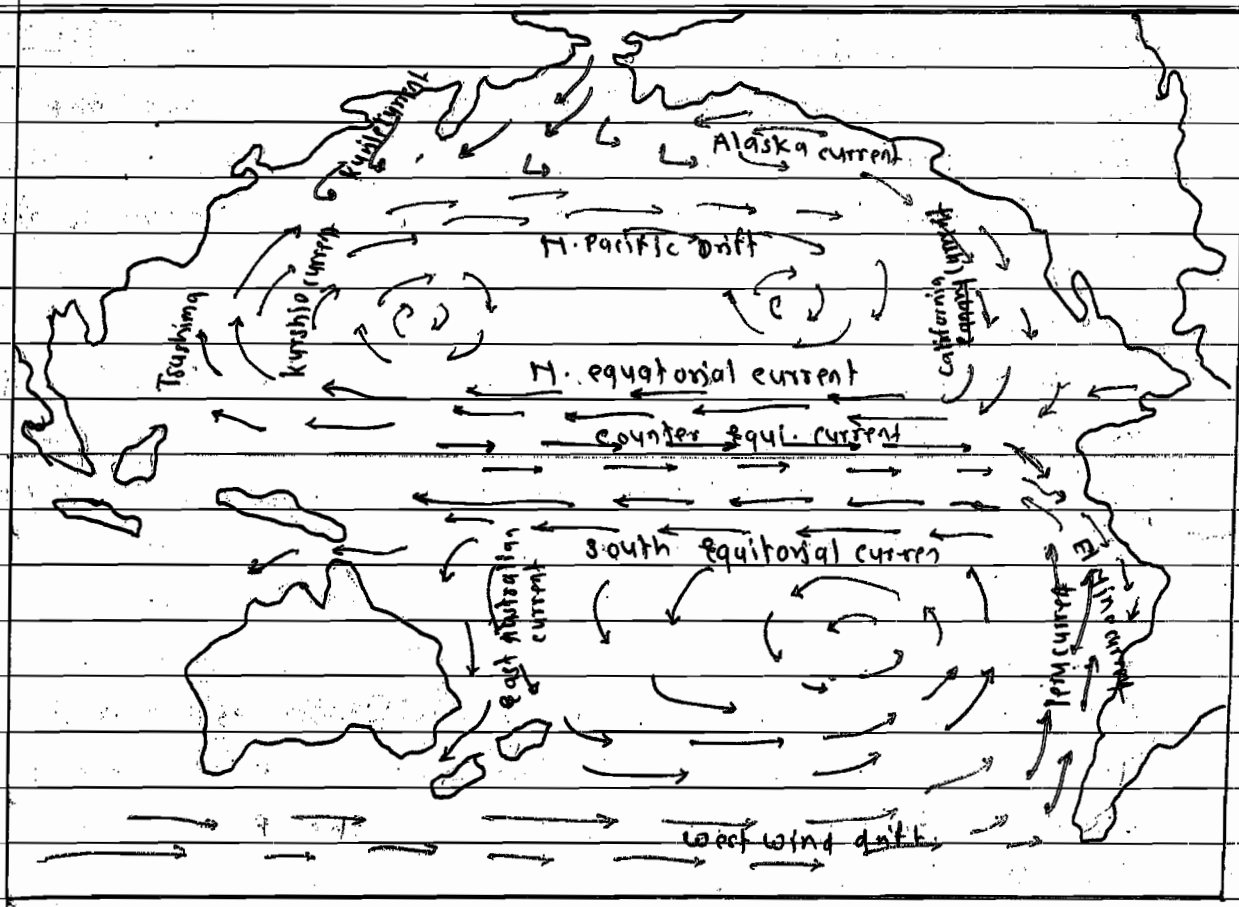
4) Kurshio System (warm) -

- It is simillar to Gulf stream system in the Atlantic ocean.
- This system runs from Taiwan to the Bering strait and consits of the kurshio current.

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① Kuroshio current -

- The north equatorial current turns northward due to the obstruction of philippines & thus gives birth to the kuroshio current.
- The average temp. 8°C and salinity 35 ‰.
- The Kurshio current leaves Japanese coast & turns eastward near 35°N latitude & bifurgated in two branches:
  - (i) one branch moves easterly direction.
  - (ii) second branch flows NE direction upto 42°N lat. & merges with Oyashio current.
- It is called as Gulf stream of Pacific.

② North Pacific drift -

- The Kuroshio current extended eastward reaches the western coast of North America.
- The north pacific drift bifurcated in to two branches:
  - (i) nothern branch becomes Aleutian current
  - (ii) southern branch gives California cold current.
- Aleutian current one branch goes towards the Bering strait while second branch moves 'Gulf of Alaska'.

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(iii) Tsushima Current-

- Near 30°N lat. enters the Japan sea & flows along the western coast of Japan.
- These current higher temp & salinity modified Japan weather.

(iv) Counter Kuroshio current-

- The Kuroshio current forms a gyral system betn Hawaiian islands & the American coast.
- Thus the oceanic water moves in westerly direction in the name of counter kuroshio current.

5) Oyashio current (cold)-

- The oyashio cold current is known as Kurile cold current.
- The cold current flows through the Bering strait in southerly direction & thus transport cold water of the Arctic sea into the Pacific Ocean.
- Near 50°N latitude this current bifurcated into two branches:
  (i) one branch merges with Aleutian current.
  (ii) second branch moves up to Japanese coast.

6) California current (cold)-

- This current is eastward extended portion of the north pacific drift.
- The California current generated along the California coast from north to south.
- This current after reaching the Mexican coast turns westward & merges with the north equatorial current.

7) Peru current (cold)-

- The cold current flowing along the western coast of S. America from south to north is called Peru current or Humboldt current.
- mean annual temprature ranges betn 14°C to 17°C. and avrage velocity 15 nautical miles per day.
- The temprature of sea water increases from the coast towards the ocean.

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EL-Nino-SO: predictability was elimDATE
variability.

8) EL-Nino or counter current: (warm)-
- A subsurface warm current known as EL-Nino current; flows from north to south betn 3°s & 36°s lat. at a distance about 180 km from the Peruvian coast. It secure every 7 or 14 years.
- The southward shifting of the counter equatorial warm current during southern winter gives birth to EL-Nino current.
- It leads to the increase in surface water temp. of 10°c

9) East Australia Current (warm)-
- South equatorial current is bifurcated near the Australian coast into northern & southern branches.
- This current flow from north to south along the eastern coasts of Australia & surrounded by New Zeland.
- It raises the tempralure of east Australian coast.

10) West Wind Drift - (cold)-
- This current flow west to east under the influence of the westerlies betn Tasmania & south American coast in the zones of 40°-50°s latitudes.
- A stronger ocean current because of immense volume of watermass & high velocity winds called as 'roaring forties'.
- Two branches: (i) one branch enters the Atlantic ocean through Cape Horn.
(ii) second branch turns northward & joins Peru current.

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Currents of the Indian Ocean:

- The current systems of Indian Ocean are largely controlled and modified by landmasses and monsoon winds.
- Indian ocean being surrounded by the Indian subcontinent, Africa and Australia.
- The currents in the Northern Indian ocean change their flow direction twice a year due to NE & SW monsoon winds.

1) **North-East Monsoon Current (warm)-**
- NE monsoon winds blow from land to the ocean during winter season in the northern hemisphere
- Thus westward blowing NE monsoon currents are produced betn Andman & Somali
- This current flows to the south of 5°N latitude.
- This current originated in the Bay of Bengal and Arabian sea and flow SW direction.

2) **Indian Counter Current (warm)-**
- Indian counter current is originated during winter season (N.H.).
- This current flows in easterly direction betn 2°-8°S latitudes from Zanzibar to Sumatra.

3) **S.W. Monsoon Current (warm)-**
- There is complete reversal in the direction of monsoon winds during summer season.
- The general direction of monsoon currents are south-west to north-east, but several branches emerge from the main branch and move in the Bay of Bengal & Arabian sea.
* The Indian counter current developed during winter season disappears due to this current.

4) **Indian Equatorial Current (warm)-**
- The currents of the southern Indian ocean are least affected by seasonal change in the direction of monsoon winds.

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- The Indian equatorial currents flows from east to west betn 10°S & 15°S lat. from Australian coast to African coast.
- After being obstructed by Madagascar this divided two branch:
  - (i) one major branch flows southward name as Agulhas current
  - (ii) other branch is directed towards the north.

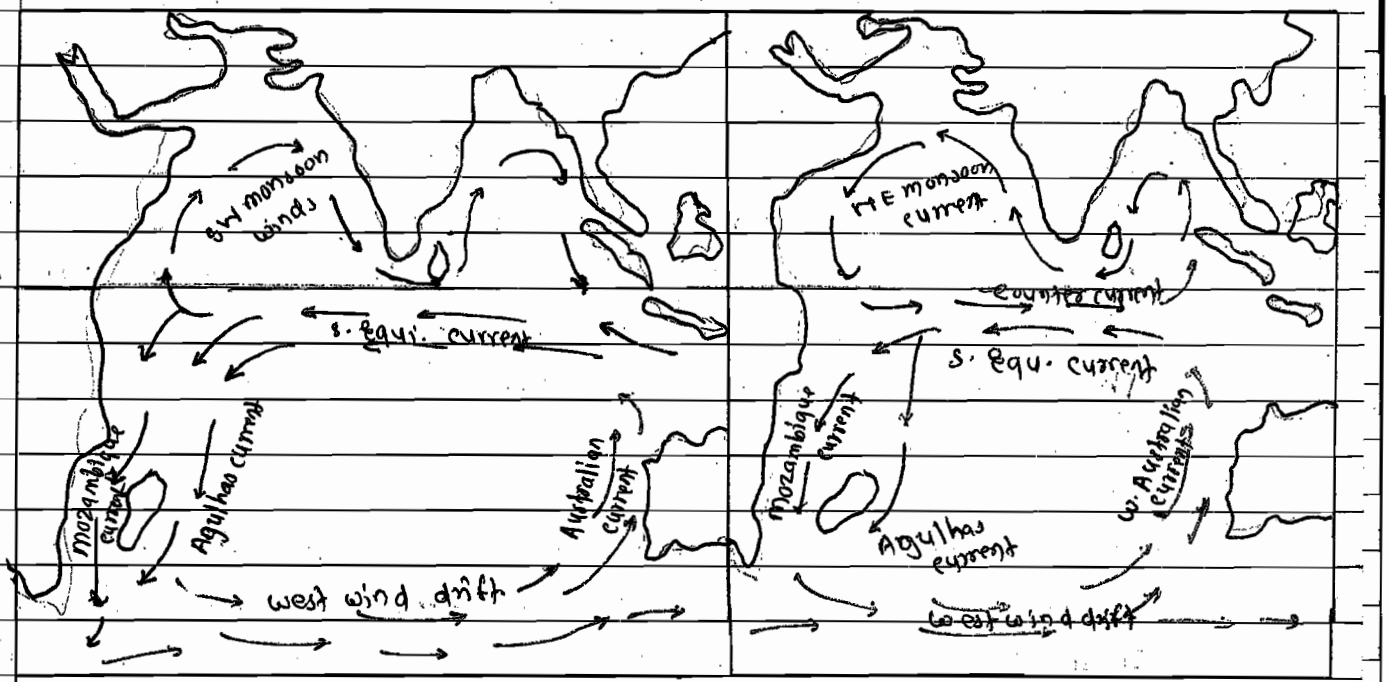


fig: currents during summer fig: currents during winter.

5) Mozambique current (warm) -
- One branch of the southern Indian equatorial current moves southward through Mozambiq channel known as Mozambique current.
- This current joins the Agulhas current near 30°S latitude & moves up to the southern tip of Africa.

6) West wind Drift -
- This current is produced due to eastward blowing westerlies along 40°N latitude known as 'roaring fourties'.
- This current is bifurcated in two branches near 120°E longitude:
  - (i) One branch turns northward & flows west 'Australian cold current'.
  - (ii) The second branch of the west wind drift turns southward.

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Effects of Ocean Currents:

1) **Modification in the coastal Climate:**
- The most effective impacts of ocean currents are seen on the temp. of affected coastal lands.
- The effects are both 'tve' & '-ve' for flora and fauna.
- Ocean currents helps in maintaining the temprature balance of oceanic water.
- Cold current lower down temp & warm current increases the the temp. considerably of the affected areas.
- The winds blowing over warm currents pick up moisture & help increasing amount of precipitation.
- The convergense warm & cold current causes dense fog.

2) **Effects of Fishing-**
- Ocean currents act as distributing agents of nutrients, oxygen & other element necessary for the existance & survival of fishesh.
- Ocean current transport planktons from one area to another area. These plankton are useful food for fisheh.
e.g. Gulf stream carries plankton of mexican Gulf.
- Some times few ocean current destroy planktons.
e.g. El-Nino.

3) **Effects of Trade and Nevigation-**
- Ocean currents determine major ocean routes for the navigation.
- The occurance of fog due to convergence of warm & cold currents pose serious threates to navigation.
- Larger icebergs brought by cold currents damage ships.

DATE

DATE

	Ocen	Current	Nature
1.	Pacific :	Kuroshio	warm
		Oyashio	Cold
		Okhotask	Cold
		Alaskan	warm
		California	Cold
		East Australian	warm
		Peruvian / Humboldt	Cold
2.	Atlantic :	Antiles	warm
		Florida	warm
		North Atlantic Drift	warm
		Gulf stream	warm
		Labrador	cold
		Canaries	Cold
		Brazil	warm
		Falkland	Cold
		Bengula	Cold
3.	Indian	Mozambique	warm
		Agulhas	warm
		West Australian	Cold

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SEA LEVEL CHANGE:

"A relative change in sea level is a rise or fall in the mean sea level of the sea surface with respect to land surface."
- Either the sea surface or the land surface or two in combination may rise or fall during a relative sea level change.

(i) Sea level rising while the land surface subsides, remains stationary or rises at slower rate.
(ii) Sea level falling while the land surface rises, remains stationary or subsides at a slower rate.

* Evedences for sea level changes:

1) Average sea level over all the changes of the last few glaciations & interglacials has been about 50-60m below its present level.

2) The height of the last glaciation (18000 yrs ago) it was betn 120m & 140m lower than it is today.

3) Sea level has risen through the post-glacial period.

4) The post-glacial sea level rises was initially fast, but it leveled off about 5000 to 6000 yrs ago.

5) Sea level has remained relatively close to its present position over the last 5000 to 6000 years.

6) The last two of which were the Medieval Advance (AD 1200-1400) & Little Ice Age (AD 1550-1800). such that the change of 1°c temp. might be expected to cause a 50mm of sea level.

7) Evidences of marine animals in the rocks of highest mountains are found & deep drilling has recorded shallow marine sediments.

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Dec. 05.

Mechanism of Sea level changes:

1) **Ice sheet melts -**
- The ice melts water will be returned to the ocean and the formerly depressed continent will isostatically recover & rise.
- The initial rate changes betⁿ 3 to 10 m per 100 yrs.

2) **Sedimentation -**
- Sediment supplied to the oceans from the continents would on its own, decrease ocean volume & therefore raise sea level.
- With current rates rise of betⁿ 15 and 40 mm.

3) **Mid Oceanic Ridge -**
- Increase in the volume of mid-ocean ridges is one of the most important reason for rise in the sea level of the sea.
- mid oceanic ridge equivalent to about 12% of total volume of ocean water.

4) **Orogenecy -**
- As orogenecy is frequently associated with crustal shortening which gives rise to both a thickening of the continental crust and a reduction in continental area.
- It can potentially have a role in global sea level change.
e.g. The formation of Tibetan Plateau & Himalayas.

5) **Small ocean basins -**
- Drying out of small ocean basins could lead to a rapid although somewhat modest changes in global sea level.

6) **Geoidal effects:**
Change in the volume of water in the oceans cause the crust to deform as it ~~vertically~~ adjust isostatically to the alterations in load.

POLITICAL GEOGRAPHY

DATE

- **Historical Perspective :**

* Founder of Political Geography : Sir William Petty.
* Father of Political Geography : Immanual Kant
* Father of Modern Political Geography : Fredric Ratzel - Book 'Politische Geography' (1897).

- University of Allahabad : 1st university of India started Political Geography (1947).

- **Defimations :**

i. Political geography as the study of relationship - "Political Geography analyses in what way man's political organisation of space and states has been influenced by adjusted to conditions of Geography."

ii. Political Geography as the study of political area - 'Human Geography concerned with ~~politi~~ geographical / natural region; But Political geography deals with artificially / man-made area i.e. political area or state'.
- Discription & analysis of political organised area. - Alexander.

iii. Political Geography as the study of areal differentiation - 'P.G. is the study of variations of political phenomena from place to place in interconnection with variations in other features of the earth as the home of man'. - Hartshorne.

iv. "राजकीय भूगोल हे राजकीयदृष्ट्या संघटीत झालेले प्रदेश, त्यांची साधनसंपत्ती व विकास आणि त्यांनी धारण केलेल्या विशिष्ट भौगोलिक क्षेत्रांच्या कार्यात्मक संबंधाशी संबंधित आहे". - Pounds N.J.G (1972)

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Scope of P.G. :

- The first attempt of delimiting the scope of P.G. was made by Richard Hartshorne (1935).
- 'Isaih Bowman' has a 'The New world' published in 1921, first important work on political Geography in America.

* P.G. of a single state area under 3 heads & 6 sub-heads :

1) Description & analysis of the state :
   i) Description & analysis as a whole.
   ii) Analysis of internal structure.

2) Interpritation of the present area :
   i) Relation to kernal areas & major limiting areas.
   ii) Direction & character of territorial change.

3) Appisal of the present territorial area & its problem :
   i) Degree of confirmity with natural or cultural landscape areas or with speical popln areas.
   ii) Harmonic & disharmonic forms.

Nature of P.G.

I. व्यक्ती व साधनसंपत्तीच्या रक्षणासाठी राज्यसंस्था जन्म घेतात. या राज्यसंस्था राजकीय भूगोलात अभ्यासाच्या केंद्रबिंदू आहेत.

II. देशांची भौगोलिक स्थिती, राज्य कारभाराच्या पद्धती, राष्ट्राची कार्यक्षमता, सामाजिक-आर्थिक स्थिती यांची चिकित्सा राजकीय भूगोल करते.

III. राजकीय भूगोल ही मानवी भूगोलाची शाखा राजकीय सत्ता (Political power) आणि भूगोल यांच्या संबंधविषयीचा अभ्यास करतो.

IV. राष्ट्रीय सीमेवर मानवी कार्यांचा, प्रभाव पडतो. तो राजकीय भूगोलाचा अभ्यास विषय ठरतो.

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v. राजकीय भूगोलाचे स्वरूप राज्यसंस्थेच्या अस्तित्वावरती निगडीत आहे. राज्य नसलेले लोक संभवनीय आहे. पण लोक नसलेले राज्य असंभवनीय आहे.

vi. राज्यसंस्थेवर नैसर्गिक व सामाजिक घटकांचा प्रभाव पडतो व त्याचा परिणाम कालानपरत्वे बदलतो. उदा: समाजवादी, लोकशाही, हुकुमशाही.

vii. राजकीय भूगोलाचे स्वरूप 'परिवर्तनशील' आहे. कारण ते परिवर्तनशील अशा नैसर्गिक व सामाजिक घटकांशी संबंधित आहे.

viii. राजकीय भूगोल 'गतिमान' आहे. कारण ते परस्पर संबंध, विविध घटकांचे पडसाद, स्थलांतरे, सीमा, साधनसंपत्ती इ. संबंधित आहे.

ix. राजकीय भूगोलाच्या शाखा: a) Election Geography
b) Military Geography
c) Critical Political Geography.

• Pounds : refers to the following aspect of P.G. :

1. The geographically coincidence of state and nation.

2. The resources which the state can command in the pursuits of its objective, the well-being & integrety of its people.

3. The social cohesion of the population. राज्य संस्थेतील लोकसंख्या, तिची कार्यक्षमता, रचना व छोटे-दोष यांचा राज्यसंस्थेवर होणारा परिणाम.

4. Every state carries on trade, however limited in scope this may be in some instances.

5. राज्यसंस्थेतील सामाजिक घटकांचे एकमेकांशी असलेले संबंध, त्यावर भौगोलिक परिस्थितीचा परिणाम.

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GEOPOLITICS :

-Karl Haushofer

- **Historical Perspective :**
  - The seed of geopolitics, sown by 'Kjellen', grew into a full tree largely through 'Karl Haushofer'.
  - In 1924 founded the 'Institute of Geopolitics' & started the publicat" of the 'Journal of Geopolitics'.
  - father of Geopolitics : Karl Haushofer (1924) 'Zeitschrift fur Geopolitik'.

- **Defination :**

I. 'The science of the earth relationship to political developments'.
भूप्रदेश व राजकीय घटना यांच्या परस्पर संपर्काच्या अभ्यासाला महत्वाचे मानले'.
-Karl Haushofer.

II. ' Geopolitics tends to focus on the political phenomena and attempts to give a geographical interpritation and study of the geographical aspects of these phenomena.'
-Kristof-

III. "राज्याच्या विकास दृष्टीकोनातून केलेला राजकीय भूगोलाचा अभ्यास म्हणजे भूराजनीती होय".

- राज्य हे सजीवाप्रमाणे असून त्याच्या विकासासाठी विशेष शक्ती बाळगली पाहिजे. राज्याची शक्ती ही भौगोलिक प्रदेशीत असल्यामुळे राज्याचा भौगोलिक प्रदेश वाढविण्याचा सतत प्रयत्न केला पाहिजे.
म्हणजेच राज्याने आक्रमक व विस्तारवादी धोरण स्विकारून दुसऱ्या देशांचा प्रदेश बळकावून घेतला पाहिजे.

- **Nature of Geopolitics :**

राजकीय डावपेचाचे, व्यूहरचनेचे मूळ भौगोलिक परिस्थितीत आहे हे जर्मन भूवैज्ञानिकांना असल्यावर त्यांनी नवीन शास्त्र आपल्या देशाच्या हितासाठी उपयोगात आणले हे नवीन शास्त्र म्हणजेच 'भूराजनीती' होय.
- जर्मनीतील शास्त्रज्ञ व त्यांचा प्रभाव वाढविण्यासाठी नैसर्गिक साधने उपलब्ध नसली हे जर्मन भूगोलज्ञांना माहिती असल्यामुळे साहजिकपणे त्यांचे लक्ष आजूबाजूच्या शेजाऱ्यांकडे होते. ज्या युद्धोपयोगी वस्तूंचे उत्पादन जर्मनी कडे कमतरता वाटते त्यांना पर्यायी वस्तू तंत्रविषयक साहाय्याने कसा शोधून काढता येतील याचा विचार

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Concepts in Geopolitics :

1. सजीव राज्य (Organic State) -

राज्य हे सजीवांप्रमाणे असल्याने त्याचा विस्तार व विकास झाला पाहिजे म्हणजेच राज्याच्या सीमाप्रदेशांत नेहमी परिवर्तन घडून आणावे की, जेणेकरून सजीव राज्यसंस्थेत नेहमी चैतन्य राहील.

2. निवासस्थान (Lebensraum - Living Place) :

प्रत्येक नवनिर्मित राष्ट्रास आपल्या लोकसंख्येस पुरेल इतकी जागा प्रदेश व्यापण्याचा हक्क आहे. सामर्थ्यवान होण्यासाठी प्रत्येक महत्वाकांक्षी राष्ट्रास स्वतःच्या मालकीचा मुबलक प्रदेश असणे आवश्यक आहे.

3. स्वयंपूर्णता (Autarky) -

सर्व वस्तूंचे उत्पादन राज्यातच होणे आवश्यक आहे. त्यामुळे आर्थिक समतोल राखला जातो. आपल्या गरजेसाठी राज्यसंस्थेवर अवलंबून राहणे हे या संकल्पनेनुसार अभिप्रेत नाही.

4. विस्तृत प्रदेश (Pan Region) -

प्रत्येक विस्तृत प्रदेशाचा विकास अफाट असल्याने तेथे अनुकूल हवामान व मुबलक नैसर्गिक साधने विपुल असल्याने तो प्रदेश स्वयंपूर्ण असू शकतात हे स्पष्ट होते.

5. जर्मन वंशाची श्रेष्ठता (Superiority of German Race) -

जर्मनीत असाही प्रचार करण्यात आला की, जर्मन वंशाचे लोक जगात सर्वश्रेष्ठ असून त्यांची सत्ता सर्व जगावर असली पाहिजे. ते यहूदी किंवा इतर धर्माच्या लोकांना कमी समजून त्यांचा द्वेषही करीत.

6. सीमा प्रदेश (Frontiers) -

जगावर स्वाभिमान राष्ट्रविस्तार झालेल्या देशांचे सीमाभाग म्हणजे त्यांची मोहिमेतील विश्रांतीस्थानेच होय. सीमाप्रदेशात नेहमी बदल घडून आणावेत म्हणजे राष्ट्रात चैतन्य राहते.

7. भूसत्ता विरुद्ध नाविक सत्ता (Land Power vs Sea Power) -

मॅकिन्डर यांची मध्यभूमी म्हणजेच 'भूसत्ता' होय. यानंतर विज्ञान व जपानमध्ये नौदलाचा विकास झाल्यामुळे या दोन शास्त्रज्ञांनी राज्यसंस्थांना होकायंत्र यांनी 'नाविक सत्ता' संबोधून यात परस्पर संघर्ष होणे अटळ आहे हे स्पष्ट केले.

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- **Purpose of Geopolitics -**

1. भूराजनितीमध्ये मानव, भूप्रदेश व नैसर्गिक संपत्ती यांचा वस्तुनिष्ठ अभ्यास केलेला असतो.
2. राज्यसंस्थेतील लोकांचे राहणीमान व जीवनमान उंचावण्यासाठी अशा प्रकारचा अभ्यास आवश्यक असतो.
3. अनेक राष्ट्रीय योजना कार्यवाहीत आणल्या जात असताना अनेकदा योजनांचे आर्थिक राज्यसंस्थेवर त्याचे वेगवेगळे परिणाम होण्याची शक्यता असते.
4. आंतरराष्ट्रीय प्रश्नांची सोडवणूक करण्यासाठी व आपापसातील वादविवाद, तंटे, युद्धे व युद्ध म्हणजे शांततेच्या व संघर्षाच्या मार्गाने कसा येतो.
5. बहुतेक सर्व वादग्रस्त प्रश्न भूप्रदेश व त्यावरील नैसर्गिक साधने यांच्याशी निगडित असतात

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GLOBAL STRATEGIC VIEWS:

MAHAN'S Sea Power: - A.T. Mahan

- The firstly global strategic view model is attributed to 'Alfred Thyer Mahan (1840-1914).

"A great highway & better perhaps a wide common space over which men may pass in all directions, but on which some well-worn path shows thats controlling reasons have led them to choose certain lines of travel rather others. Trade is normal for all states and seaborne trade especially so for those states which border the sea".

* Factors affecting the development of sea power of a state -

i) The geographical location of state.
ii) The physical coastline structure of state.
iii) Length of coastline.
iv) The size of popln of the state.
v) The national character.
v) The character of goverment & policy.

The HEARTLAND Theory:

- Halford J. Mackinder

- The 'Geographical Pivot of History' which he delivered before the 'Royal Geographical Society'. (1904)
- The Eurasian core which he named as 'Pivot area' (1904) later as Heartland (1919) was in accessible to sea power & possessed.

'Who rules East Europe commands the Heartland
who rules the Heartland commands the World Island
who rules the world Island commands the world'.

- These theory are formulated in book 'Democratic Ideals and Reality (1919).
- Mackinder modified areal spread of the pivot area in 1919 & again in 1943.

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T.W. Freeman - A Hundred Years of Geography.

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1) The Heartland :

- It is a vast area in Eurasia characterised by inland drainage system, seas and lakes.
- It streched volga river to eastern siberia and Himalaya to Arctic ocean.
- It cover 9 million sq|mile area.
- It was inaccessible sea power, arctic ocean frozen throughout year.

i) Pivot area in 1904 -

- Entirely Russian in Eastern Europe & largely Russian Asia. It includes china, mangolia, Afganistan, Baluchisthan, Iran.

ii) The Heartland in 1919 -

- The limit of the pivot area was extended westward to include all of European Russia.
- It include Baltic sea, lower danube, Black sea, Asia minor, Armenia, Pertia, Tibet & mongolia.
- In 1919 Heartland lost it's charactaristics.

iii) Basin land 1943 -

- Mackinder modified the geographical contours of the Heartland by excluding the eastern most part of siberia.
- This exception is 'Lenaland' / siberia east of Yenesi river.

2) Inner / marginal Cresent :

- The marginal lands of Eurasia encircle the pivot area on its west south & east collectively refered to by inner / marginal (recent).
- It include whole Europe, N. Africa, middle east & south east Asia (India, china, Pak, Bangaladesh).

Charactgrictics -

(i) It is an area of oceanic drainage & navigable river.
(ii) Accessible to sea power.
(iii) Marginal crecent co-inside with four religion - christinity, Islam, Hinduism, Budhism.

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3) Outer / Insular cresent :

- The world ocean & widely seprated lands of the outer or insular cresent.
- It including North & south America, Australia, British & Japanise island and Africa (south of the sahara)

"Mackinder called as second Heartland"

- Importance of Heartland :

i. Heartland was a vast area of Arctic & drainage.
ii. It surrounded by physical barriers on all sides except on the west.
iii. The vast size, central location & inaccessibility the chances of defence.
iv. The sources of power much self sufficiency in food & raw material.
v. Their potentiality in popln, wheat, cotton, fuel & metal. so great vast economic world.

- Critique :

i. Mackinder wrongly equated power potential with share geographical area.
ii. Heartland was a region of permanant difficulties & westland.
iii. In a general sense railway age ending & air age starting, he do not recognised.
iv. Mackinder ignore sea power & dominant a land power.
v. Marcator projection map, which created failse picture Arctic ocean, N. America, Eurasia.

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° Present day validity :

1. He pridict Germany control the Heartland, after 2nd world way Germany defeat & soviet union great power in world.
'who rules the east europe, commands the Heartland'
1st line of theory came to be true.

2. U.S.A as a great potential power after 2nd world war, political situation change in europe,
- Declaration of Soviet union has lost political grip over east europe, validity of 1st line no more there.

3. In late 20th century U.S.A. & W. European countries great power potential mean 'midland Basin' concept as true.

4. - Early 21th century position is also change, Because recession on 'midland Basin' & power potential of inner marginal crecent.

5. - मॅकिंडरच्या भूमीवर मुख्यत्वे सोव्हिएत संघाचा प्रभाव असल्यामुळे हृदयस्थळाचे उत्तर ध्रुवाचे महत्व अधिक वाढलेले आहे.
- आता नवे आर्क्टिक क्षेत्र हे 'नवीन किंवा आधुनिक हृदयस्थळ' बनू पाहत आहे.
- उत्तर ध्रुवास केंद्रीय स्थिती प्राप्त झालेली आहे. कारण त्याच्या चारही बाजूस युरोप, आशिया & उत्तर अमेरिकेचे भूप्रदेश आहेत.
उदा: U.S.A., कॅनडा, रु. चीन, रु. युरोप, जपान इ.

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THE RIMLAND THEORY :

- Nicholas J. Spykman

- 'The Geography of Peace' published in 1944.
- Spykman conclude that several weakness of Heartland. He pointed out west of the Yenisei river & forming the 'Heartland' was all 'Westland'

'Who rules Eurasia commands the Rimland;
who rules the Rimland commands the world'

- The area of 'Rimland' which coincide approximetly with mackinder 'inner/ marginal crecent.
  e.g. Asia minor, Arabian countries, south Asia, South East Asia, Korea, East saiberia, etc.
- All these countries lie buffer zone i.e. betⁿ sea power & land power Spykman termed 'Amphibian States'.

- The American schollar considered that 'Heartland less important than Rimland', which contained most of world popⁿ & resources.
- युरेशियाच्या हृदयस्थलाच्या लाहय दबावापासून समान रूपात प्रभावित होऊन परिघीय देश एकजूट केल्यास युरेशियाच्या चारही बाजूचे मार्ग बंद होतील.
  बाजूचे हृदयस्थळ शक्ती आपोआपच केंद्रित होऊन नष्ट होऊ शकते.

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Critique:

i. Spykman theory is self fulfilling prophecy.

ii. No one country in world who able to control all the countries of Rimland

iii. The inner crecent region are different religious e.g. christinity, Islam, Hinduism, Budhism etc.

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STATE :

- **Meaning -**
  - state : latin word 'status'
    Greek word - Polis means nagar, (city-state)
    Roman word - 'Civitas'
  - mackvati first time used the concept as a 'state'.

- **Defination :**

i. 'The state as a concept of political science and public law is a community of person more or less numerous, permanently occupying a definite portion of territory, independent or nearly so, of external control of possesing an organized goverment to which the great body of inhabitant render habitual obedience.'

— 'Garner'

ii. आधुनिक राज्य म्हणजे निश्चित असा भौगोलिक सीमा असलेले राष्ट्र, त्यातील समाज स्वतःच तयार केलेल्या राज्यघटनेनुसार विविध विधिनियमांनी संघटित झालेला असतो. असा समाज व्यक्तीचे हक्क आणि कर्तव्ये निश्चित करतो आणि त्यांचे रक्षण करण्यासाठी विधिनियम बनवितो व आपल्या आदेशपूर्तीसाठी स्वतःच्या राज्यघटनेनुसार सातत्याने कार्य करतो.

— प्रा. आनेकर आणि

- **Evolution of State :**
  - i) Tribal states
  - ii) Greek city states
  - iii) Oriental Empires (ultafrey)
  - iv) The Roman Empire
  - v) Feudal states (सरंजामी)
  - vi) Nation states
  - vii) modern states - Colonialism
  - viii) World state

- **Component of state :**

1) **Permanant Population -**

अस्थायी, भरकटलेल्या, दुर्बल आणि अकार्यक्षम असणाऱ्या लोकसमूहापेक्षा कमी लोकसंख्या असलेले ; पण सुशिक्षित, कार्यक्षम, राष्ट्रप्रेमी लोकांचे राज्य केव्हाही प्रगती करू शकते. असा लोकसमूह आपल्या राज्याचा दर्जा व प्रतिष्ठा उंचावू शकतो

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2) Territory :

- प्रत्यक्षात आपल्याला आढळते काही क्षेत्रफळाच्या राज्यापासून प्रचंड मोठे क्षेत्रफळ असलेल्या राज्यापर्यंत अनेक आकारमानाची राज्ये दिसून येतात.
- लोकसंख्येप्रमाणेच राज्याचा भूप्रदेश केवढा असावा याबाबत काही नियम ठरविले असलेला आहे.
- केवळ विशिष्ट भू-प्रदेश असून त्याचा उपयोग नसतो, तर जमिनीची सुपिकता, खनिजसंपत्तीची उपलब्धता, पाण्याचे स्रोत हे घटकही महत्त्वाचे असून ही प्राप्त झालेल्या जमिनीचे उपयोगी ठरतात.

3) Government —

- राज्य ही अमूर्त कल्पना असून सरकार हे त्याचे मूर्त स्वरूप आहे.
- राज्याच्या सार्वभौम सत्तेचा प्रत्यक्षात वापर करणारी यंत्रणा म्हणजे शासनसंस्था होय.
- सामान्यतः राज्याची संस्कृती, इतिहास, लोकांचे विचार, आचार, आर्थिक परिस्थिती, सामाजिक समाज रचना, शैक्षणिक प्रगती, राजकीय पार्श्वभूमी इ. गोष्टींवर राज्याची शासनपद्धती अवलंबून असते.

4) Sovereignty :

- सार्वभौमत्व म्हणजे सर्वोच्च सत्ता, सार्वभौमत्व सत्ता हा राज्याचा प्राण, आत्मा होय. प्राणाशिवाय व्यक्तीचे अस्तित्व टिकू शकत नाही, त्याचप्रमाणे सार्वभौमत्वाशिवाय राज्य अस्तित्वात येऊ शकत नाही.
- 'राज्याच्या अंतर्गत कारभारात सर्वश्रेष्ठ असण्याची आणि बाहेरील देशांच्या नियंत्रणापासून स्वतंत्र असण्याची अशी सत्ता म्हणजे सार्वभौमत्व होय.'

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Nation:

- Meaning - Latin word 'Nasci' means to born.
  यावरून आपणास असे म्हणता येईल की, एकाच वंशात जन्मलेले लोक किंवा एकत्राच्या नात्याने बद्दल असलेला मानवी समाज होय.

- Definations:

1. 'A nation is a body of people who feel themselves to be naturally together be certain affinities which are so strong & real for them that they can live happily together are dissatisfied when disunited and cannot tolerate subjection to people who do not share those ties'.
   - Ramsay muir.

11. 'भाषा, वाङ्मय, कलपना, प्रथा-परंपरा या जातीय साधर्म्य असलयामुळे राष्ट्रात असणारा आणि अशा प्रकारच्या इतर समाजापेक्षा आपले वेगळेपण दर्शविणारा लोकसमूह ज्यावेळी राजकीय दृष्ट्या स्वतंत्र होतो त्यावेळी ते राष्ट्र बनले".
   - मॅकॅ आयव्हर.

- Factors of the origin of Nation:

1) Homogeneity of Territory.
2) Racial equality
3) cultural inility
4) Historical aspects
5) Equal political goal.
6) Nationality
7) Economical condition
8) Goverment.

- Characteristics:

1. People of nationality should speak a comman language & follow the same religion.
11. It is not necessary that people belonging to a nation should common language or religion. e.g. canada - four language two state.
111. Religion is now no more in important factor in national unity. e.g: India as a seval regional language & religions.

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NATION - STATE :

- **Meaning :**

- રાષ્ટ્રીયતા આવનારમક ભાવ આહે, તિચે સ્વરૂપ વરિવર્તિશુ આહે.
- પ્રાચીન કાળી હી નિષ્ઠા વંશાચા હોતી, મધ્યયુગાત હી નિષ્ઠા ધર્માચા હોતી, આધુનિક કાળાત માનવી સમૂહાને હી નિષ્ઠા રાષ્ટ્રાચા વાટિલેલી આહે.
- રાષ્ટ્રનિષ્ઠા - રાષ્ટ્રપ્રેમ હે સર્વોચ્ચ મૂલ્ય બનલેલે દિસતે.

- **Defination :**

1. 'The state is the political expression of the nation we have called as nation-state'.
- Nation-state refers to the political enitity of nation.

11. 'રાષ્ટ્રીયત્વાચ્યા આધારે રાજ્યાંચી નિર્મિતી ઝાલેલી અસૂન ત્યાલા રાષ્ટ્ર-રાજ્ય અસે મ્હણતાત.'
- રાષ્ટ્ર-રાજ્ય હી સંકલ્પના આતા સાર્વત્રિક વ सर्वमान्य ~~सर्वसामान्य~~ આહે.

- **Elements of Nation state :**

1) ભૌગોલિક એકતા - એકાચ ભાગા મધ્યે સુપ્રદેશાવર વિવિધાનુવિધતા રાહણાચ્યા લોકાંનાહે આપલ્યા સુપ્રદેશાવદ્દલચા આત્મીયતા અસતે.

2) વાંશિક એકતા - આજ જગાત પૂર્णપણે શુદ્ધ સ્વરૂપાત કોણતાહી વંશ રાહિલેલા નાહી. વંશમિશ્રણ ઝાલેલે આહે. એકાચ વંશાચ્યા લોકાંચે રાષ્ટ્ર હી કલ્પના આપલ્યા કાળાત કાલબાહ્ય માનાવી લાગેલ.

3) આર્થિક એકતા - સમાન આર્થિકાંનાહે એકાત્મિયતેચી આવના નિર્માણ હોતે. જગાનાહે બહુઆર્થિક રાષ્ટ્રેહી આઢળતાત.

4) ધાર્મિક એકતા : ધર્માચ્યા આધારે જગાત કાહી રાષ્ટ્રે નિર્માણ ઝાલેલી દિસતાત. આધુનિક કાળાનહે ધર્મનિરપેક્ષ રાજ્યાંચી કલ્પના उदयास આલેલી અસૂન આપલે રાજ્યાંની તી વિકસાવલેલી આહે.

5) સાંસ્કૃતિક એકતા - સાંસ્કૃતિક એકતા અસણ્યાસ આપલ્યા પરંપરાવિષયી, કલા વ વાઙ્મયા વિષયી સમાનાનહે જો અભિમાન અસતો તો એકાત્મતેચ્યા આવનેલા પોષક ઠરતો.

6) રાજકીય વ આર્થિક હિતસંબંધાસુકે રાષ્ટ્રીય એકાત્મતા નિર્માણ હોઉ શકતે

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मुद्दे	राज्य	राष्ट्र
घटक	राज्यासाठी भूमी, शासन, लोकसंख्या, सार्वभौमत्व हे चार घटक आवश्यक आहेत.	राष्ट्रासाठी भाषा, धर्म, वेश, संस्कृती, इतिहास या दृष्टीने समान असणाऱ्या समूहात राष्ट्र ही भावना असते.
संघटन	राजसंस्था ही सुसंघटित संस्था आहे.	राष्ट्र हे संघटित किंवा असंघटित असू शकते.
दंडशक्ती	राज्याजवळ दंडशक्ती असते. त्याशिवाय राज्य अस्तित्वात येऊ शकत नाही.	राष्ट्राजवळ दंडशक्ती नसते. त्याची गरजही नसते.
भूप्रदेश	राष्ट्राला निश्चित भूप्रदेश आवश्यक आहे.	राष्ट्र हे राज्याच्या भूप्रदेशाच्या बाहेरही असू शकते.
राष्ट्र-राज्य	एका राज्यात अनेक राष्ट्रे असू शकतात. उदा - रशियन राष्ट्रकुल देश.	एका राष्ट्रात अनेक राज्ये असू शकतात. उदा - युनायटेड अरब रिपब्लिक.
राष्ट्रभावना	राष्ट्र या भावनेचा अभाव असला तरी राज्य निर्माण होऊ शकेल.	राष्ट्रासाठी राष्ट्रीयत्वाची भावना आवश्यक असते.
सदस्यत्व	राज्याचे सदस्यत्व एकाच विचारांच्या व्यक्ती-पुरतेच मर्यादित नसते.	राष्ट्राचे सदस्यत्व समान विचार असणाऱ्या व्यक्तीपुरते मर्यादित असते.
संकल्पना	राज्य ही राजकीय संकल्पना आहे.	राष्ट्र ही राजकीय संकल्पना असून मनाची भावनिक अवस्थाही आहे.

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BOUNDARIS AND FRONTIERS

FRONTIERS:

- **Meaning -**
  - English word 'frontier' - means in front
  - Latin word 'frons' & french word front - means forehead.
  - Different words are used to frontier like foreland, Borderland, Neutral zones etc.

- **Defination -**

1. "It is social system, hinterland or civilization by a area or zone seprated to each other."

2. 'राज्याच्या लगत्य बाजूला असणारा असलेली जी वेगळ्या कुपान ज्या बाहेरचा राज्याचा क्षेत्राच्या कुपान अस्तित्वात असते.' — Moodi

- **Types of Frontiers:**

1) **Natural frontier -**
   - Large and wide, inaccessible regions with absolutley no human concentration this region is natural frontier.

   e.g- Deserts, mountains, river basin, marshes & forest etc.

2) **Ethinic / Anthropogeographical frontier:**
   - The two or more political ecumenes, & were thinly & sparsely inhabited by the people of different racial stocks who might be culturally backward & inhabitants of ecumenes.

   e.g.- Balkhan region, SE Europe, SE Asia, Indo-china etc.

3) **Geometrical / Astronomical frontiers -**
   - The period of colonial expantion, the frontiers are straight lines & were draw across the unknown interior territories., regardless of the territorial features or ignoring all geographically reality.

   e.g- Interior tesitori of Aus, USA, & Africa.

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4) Political frontier -

- political frontiers were more rapidly organised into marchland because of their fluid political character.
- Political frontiers which sort to distingwish betn political system.

e.g: British empire - Iran east & Hindkush east.
Turkish empire - SE Europe & west Asia.

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BOUNDARIES:

- Defination -

I - "Boundry refers to a line which demarcate the outer limit of the state or nation".

II. "એક આંતરરાષ્ટ્રીય સરહદ આવી રેખા અથવા કે, જ્યાં કોઈપણ કાયદેસર સીમા નિર્ધારિત કરવે કે, જ્યાંથી રાજ્યોને શાસન અથવે." - ગાર્નર્સન

- classification of Boundries :

a) Morphological classification

(1) Physical Boundries -

- These subdivided in to mountain & hill boundries, river, lake & swamp boundries, forest & desert boundries.
- These physical boundries either follow features marked by nature or pass through physical terrain.

i) Mountain Boundries -

India	x China	: Himalaya
Chile	x Argentina	: Andes
Spain	x France	: Pyrenees
Peru	x Equador	: Andes

ii) River Boundries -

Paraguay	x Argentina	: Parana
Uruguay	x Argentina	: Uruguay
India	x Pakistan	: Satlaj
Myanmar	x Thiland	: Salween
Venezuela	x Colambia	: Orinoco
Zaire	x Cango	: Cango
Zimbabwe	x Botswana	: Zambezi
USA	x Canada	: Rio Grande.

iii) Lake Boundries -

USA	x Canada	: Great lake
Switzerland	x Germany	: Constance
Tazania	x Maloj	: Nyasa
classified a	x Kenya x Tazania	: Victoria.

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2) Geometrical Boundries :

- Those defined in geometrical terms, such a parallels, meridians straight lines & arcs of circles.
- Geometrical lines are first & formost lines of latitudes & longitude which appears on map straight line.

Example :

N. Vietnam	x	S. Vietnam	- 17° N
Egypt	x	Sudan	- 22° N
N. Korea	x	S. Korea	- 38° N
USA	x	canada	- 49° N
Alaska	x	canada	- 141° W
W. Irian	x	Papua Guinea	- 141° E

3) Anthropogeographical / cultural Boundries -

- The anthropo-geographic boundries are those which follow social, linguistic, religious & such other divides present in the cultural landscape.

Example :

India x Pakistan - Religious differences

Israel x Neighbours - Ethinic & social differences.

4) Complex Boundries -

- International boundries follow either natural, ethinic, physical, geometrical are complex in nature.

Usually each & every boundry is complex.

Example :

USA x mexico : Rio Grand River & EL Paso straight line.

USA x canada : Great lake, St. Lawrence river and 49° N parallel.

b) Genetic classification / functional :

- Richard Hartshorne (1936) ; The basis of such classification was the strong relationship that existed betn international boundries & the cultural landscape.

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1) Antecedent Boundries -
- Those which are delimited & demarcated before the settlment of the area by the people who established them.
e.g: USA x canada.

2) Supey -imposed Boundries:
- The superimposed boundries were also established in the territory which has been fully developed as one economic and cultural region.
e.g- N. Korea & S. Korea, N. Vietnam & S. Vietnam, E Germany & w. Germany.

3) Subsequent Boundries:
- The international boundries that have been established subsequent to the development of the prevailing cultural pattern are termed as subsequent.
e.g - German x polish, Indo x Pak, Indo x Bangaladesh.

4) Consequent Boundries -
- The international boundries that have been made to follow divides bet^n populated areas either because of
- absence of population or presence of barrier seprating the two popl^n are called consequent boundries.
e.g - Himalayan & Pyrenees mountain.

5) Relic Boundries -
- Those boundry which have ~~currently~~ currently lose their political function but which still present in cultural landscape.
e.g - Poland & Germany.

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Politics and world Resources -

- The states and the relations betⁿ them are greatly influenced by the economic elements of political geography.
- The economic elements are comprised the basic 'natural resources' of food, power, minerals & industry, trade, transportation etc are artificial resources.

a) Food Resources -

i. As food supply is necessary for human welfare, it is the primary duty of each state to provide adequate food to its population.

ii. The food efficency important to during time of famine, drought, flood & war.

iii. No states can be entirely self-sufficient in all food resources, few states such as the U.S.A. & France closest to self-sufficiency in food.

iv. western countries importing foodstuff & exchange for manufacturing goods e.g- U.K. Germany, poland etc.

India's Food situation -

- At the time of India's Independence, the food situation was extremly critical.
- five year plan & Green Revolution helped the Indian farmer in increasing the yield food crops.
- The present time India food self sufficency & export wheat & rice to other countries.

b) Power Resources:

- Power is one of the economic future of nation & political power of the state.
- No state is self sufficient in power production.
- The USA, China & Russia are self sufficency in energy resources, & deficiency Japan & W. Europe.

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1) Coal -

- Coal has a political instrument in international politics.
- Aus, USA & china are leading state of coal export and Japan & w. europe important leads by importing coal.
- stock of coal is limited, so it influence on world politics.

2) Mineral oil -

- maximum country depend on middle east.
- major oil producing region ; Russia, USA, middle east and Saudi Arabia & carribian.
- Petroleum is geostrategic & economic important.
  This resources are not equally distributed all over the world,

3) Hydroelectricity -

- In develop mainly in industrialy developed country e.g. N. America, Europe.
- Some country are mainly depend on hydropower for their industry, so the 'dams' have geostrategic importance.
- The development of water resources power requires very large capital investment.

4) Atomic Power -

- Atomic power sustain their industrial power.
- USA lead production after france, U.K., Japan & Russia are large producer.
- The concern is focused on enviormental & safety measure. Need uranium & Thorium.

Indias Power Resources -

- The regard India position coal satisfactory but petroleum position is alarming.
- Self sufficeny coal has been achived, to heavy dependance on oil importer.
- Hydroelectricity is in backward stage in India.
- The nuclear plant contributed only 3%.

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c) mineral resources -

- mineral resources may mean wealth to a small nation
- minerals provide one of the bases of industrial strength, they are much demand today.
- No developed nation is self sufficent in minerals.
- During war time essential minerals invertibly proves to be a serious handicap.
- USA produces sufficent coal & iorn ore, But other minerals import.

Indias mineral resources:

- India richly endowed with minerals, special iorn ore, mica and magnesium.
- Exporting iorn-ore, mg & mica and import petroleum, thorium, diamond & gold.

conclusion -

i. No any one country self sufficent in all resources.
ii. Every county import resources & higher technolgy play vital role in world politics.
iii. Basic resources importing country may be face dangerous problem during war period.
iv. Unequal distribution of resources is the main reason of world trade.

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FEDRALISM

meaning :

- ' The study of fedralism belong to the field of political Geography'
- The term 'fedralism' is derived from the word 'fedral' which means - a state in several forms in unity, but remains independent in internal affairs'.

a Defination -

i. 'It is a goverment device where by outward unity is maintained while allowing a degree of autonomy in some field of goverment to the constituent region of the state. - Pounds.

ii. 'fedralism is universaly defined implicity in terms of component political & ligal units sharing equally the fedral relationship among themselves & with the general goverment'. Tarlton.

iii. 'The goverment in which soverginety is constitutionly divided betn central and state goverment'.

a Concepts of fedralism :

1) Symmetry

- would be one composed of political units, comporised of equal territory and population.
- similar economic features, climatic conditions, cultural patterns, social grouping & political institutions'.

2) Asymmetry

- Each component unit would have about it a unique features or set of features which would seprate in important ways.
- Its intrests from those of any other state or system considered as a whole.

3) Fedration -

- meaning to unit together in a league for some comman objects.

classmate

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4) Confedration -

- A term reserved for fedral organization of a loose order.

e.g : swizerland.

5) Union -

- The states which enjoy the status of being members of the fedral system and share a division of power with the union.

e.g : soviet union, Indian union.

- Geographical factors in the fedral system :

i) Vast Area -

- Countries of large area & small popln or even of rather large popln concentrated in widely scattered areas, are obviously suitable for the fedral system.

e.g : Brazil, cango, USA, canada.

ii) Shape -

- It is obvious that fragmanted states & states with pronounced.
- An elongated state possessing more than one core also sought to turn to a fedral arragment.

e.g : malaysian fedration (Malaya, Sabah, Sarwak).

iii) Diverse Population -

- The larger state greater the internal diversity. The multiplicity of race, religion & language.
- In those countries ethenic, linguistic, religious or cultural differences of the people.

e.g. Yugoslavakiya - slovense, croats, serbs & muslim.
U.S.S.R - multi ethenic, lingual, religious.

iv) multi core nature :

- fedral states can adjust to the presence of more than one crore area more easily than unitory states.

e.g. Australia, Canada, Nigeria, Pri 1971 Pakistan.

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- Types of fedral states :-

a) On the basis of government -

1) Unitary state -
- There is only one goverment which excercises its power over all parts of the state.

2) Fedral state -
- The central goverment excercise its power on subjects such as defence, foregin affairs, currency, communication etc.
- The goverment of component units enjoy the freedom to manage the internal affairs such as education, revenue, justice, law & order.

b) On the basis of relation -

1) metual intrest -
- In some fedral states popn is homogenous as it is charactrised by comman language & ethinicity, while in others people differ in some important respect.
e.g : Switzerland, Australia, U.S.A., & Brazil.

2) Compramise -
- some fedral states were established as a result of the willingness of the participating people to safeguard the interest of the large state at the cost of the individual interest.
e.g : Indian union, compromise & adjustment nigeria etc.

3) Centralised -
- The centrallsed fedral states are more unitory than fedral.
- They function as centralised states inspite of their fedral constitution e.g : USSR, Ugoslavakiya.

4) Imposed -
- These are a few fedral states on which fedral system was imposed much against the wishesh of the majority people who were involved.
- There were established either by a powerfull mionority or a colonial power.

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5) Shape induced -

- In some case the shape fragmented or prorupt - forced the political leaders to option the fedral polity for the solution of the problem arising out of an odd shape.

e.g : Pakistan, Malaysia.

• Indian fedralism:

i. Large size & very large population - it is 2nd largest country in popln & 7th largest in area.

ii. Diversity - India is a great diversity of linguistic, cultural, religious, ethnic etc.

iii. Complex physical frame work - India has distinct physical division are; Himalayan, North plain, Deccan plateau, etc..

iv. Indian fedration is a 'quasi - fedral' constitution.

1. Founder of Regional Planning: Buntan and manky
   Book: New Exploration - 'A philosophy of Regional planning'
2. Regional Planning - equal word 'TVA' (Tennesy valley Authority)
3. Bernard Verinious - Regional Geography (1650)
4. Growth Pole model - francis Perrox
5. Propulsive Industries - J.R. Bourder ville's
6. Polarization & Trickle down effect - Albert Hirschman's
7. Metropolis - satellite model - Gunder frank's
8. Anti growth pole strategi - Richardson's
9. Circular & cummulative causation model - Gunar myrdal's
10. Centro - Peripheri model - John R. frideman's.
11. 'Renaissance period written by world Geography - Bluveries
12. Delimit Agricultural region - Nestayan.
13. National mapping organisation - culcuta, 'three region'
14. Pivotal Development - Perox
15. cumulative result theory - mirdal
16. Resources cycle - I.B. Komar.
17. Production cycle - Kolovansky

Crop insurance planning - 1982

All industrial company act passed - 1985

P. Sengupta India divided - seven parts.

Joint Growth Theory - B.J.L Berry

Rural development 'Block level' program - 1981

Planning region proposed in India - Prof. Jweg (1968)

Regional planning started in India - 1961

India Planning prepared - State level.

Program of women & children - DWCRA

IRDP (Rural Development program) started - 1975

Geographical description of world during 19th century - Humboldt.

The human characteristics along with physical characteristics for the determination of regions - Esa Bowman.

Planning Region's of India P. Sen Gupta & Galina Sadasyuk - 7 macro, 42 medium.

A.P. mishra, Sundram, B.L. Prakashrao - 13 macro, 36 medium.

Agricultural climatic region of India - 15

The word 'compage' used - whittlesy

Agricultural regions of India based on statistical method - P. sengupta.

Delineated of cities -

1. Benglore - P. sengupta.
2. Allahabad - Prof. Ujagar Singh
3. U.P. - Raiffulh

India divided in to regions -

1. Physical - makfarlen
2. Statistical
3. Natura feature, structure & climate - D. stamp.

U. map - 3 main & 12 sub regions.

India : a regional Geography written by - R.L. singh.

- Regional Concept in Geography
- It's application to planning
- Concept of planning region
- Regional hierarchy
- Types of regions and methods of regional delineation.
- Conceptual and therotical framework of regional planning
- Regional planning in India.
- Concept of Development
- Indicators of Development
- Regional imbalances.

ITS APPLICATION TO PLANNING

Regional concept in Geography -

homogeneity of given region

"A region is a unit of land having a unique character or homogeneity, based on local features of geology, relief, soil, climate, vegetation and human way of life." समान भौगोलिक विशेषताओं समानता समूह जो विशेष नाम से जाना जाता है।
उदा: भौगोलिक, आर्थिक, सामाजिक.

* for example -
The Central valley of California, Indo-Gangetic region etc.

* The concept of region is generally linked with 'space' and has spatial dimention.
* Economist - generally linked with engaged in formulation of genaral growth theory.
* Geographer - region is an objective reality with 'space'.

* The major problems, sometimes a part of district, or the whole district or the whole state or cluster of state are also refered as region.

- But this confusion can under reduced as for as region is under they can three categories:

① Homogeniety - एकसमानता
They may be combination of natural, economical and socio-cultural regions.

② Nodality - केंद्रीयता
C.B.D. sugar industry.
Nodal region can also be delineated in to a polarization flow, their surrounding some central urban plac

③ Programming - कार्यान्वयन
It may be administrative or may be political institution.

* Regions have following features:

(a) A region should have location. e.g - Middle East, S.E Asia, NW Europe etc.

(b) Region should have spatial extent. Example - Thar desert, sahara desert.

(c) Region should have boundries. Example - Indo-gtaamtic plane, Himalayas - shivalik end etc.

(d) Region may be either formal or functional.

(e) Regions are hierarchically arranged.

(f) Region should have transitional boundries.

\# It's Application to Planning:

① Planning purpose -

In actual delination of region for planning purpose, it become necessary to strike a balance betn the considerations of homogeneity, nodality and administrative convineance.

② Development of Plans:

The propes implimentation of development plans, the region should have fairly homogenous economic structure, some toyographical & socio-cultural homogeneity.

③ Planning of Region -

The planning region than an area of large enough to substantial changes in the distribution of employment and population.

\# Types:

1) Physical Regions - Based on Landform, climate, Airmass & Ecosystem.

2) Cultural Regions - Population, Language, Religion, Political, Economic, Natural Resources, Urban, Agricultural, Industrial, and mental Regions etc.

CONCEPT OF PLANNING REGION

* **Concept of Region :-**

(i) " An area which has a group of one charactaristic human ~~enviorment~~ pattern or absolute to enviorment".

- American society of Planners.

(ii) " Complex of land, water, air, plant, animal and man regarded in the spatial relationship as together consisting a definate portion of the earth surface".

Organic + inorganic material relation

- A.J. Harbartson.

* **Concept of Planning :**

(i) " Planning is systematic attempt by the goverment to analyse the existing situation and sorfoyl the requirment and choose the measure needed to accomplis selected goals in a delibrate efforts to transform society

systematic attempt to complete goal.

(ii) " Today's designe for, Tommorrows action".

Planning Region :

- Planning region implies a regional unit most suitable for the purpose of planning Region.
- for defining the planning Region homogeneity, nodality are very important.

* **Defination :**

(i) Keeble - " Planning region to be an area that is large enough to enable substantial changes in the distribution of population and employment to take place within boundries"

"Planning region refers to, an unit of area which is distinguishable from another area by the display of unifying charactaristics of its own".

* **Charactaristics of Planning Region:**

① **Size:**

* The size of planning region is probable it means neither to big nor to small.
* The size of Planning Region vary from "micro scopic to global" depending upon the scale of planning operation".

② **Boundries:**

with boundries

* The boundries of planning region are not static, they are flexible which change continously.

Example - Meterological boundary changes continously (Pressure area, front, Jet stream).

③ **Shape:**

group & pack shape

* Planning Region should be geographically contigeous (simon) and should have compact shape.
* Contiguity and compactness facilitate the planning practice in many way.

④ **Natural Cohesion:**

physiographic matic condition

* The natural cohesion means the planning region has same physiographic condition or climatic condition.

Example - Thar Desert, Chota Nagpur plateau.

⑤ **Social Cohesion:**

by cohesion bind together

Planning region must have a high degree of social cohesion and socially significant bind region together.

Example - Tribal belt of central India.

⑥ Resources -

- It should be large enough to contain a range of resources.
- It resource should be satisfactory level of product.
- Its internal homogeneity of resource structure.

⑦ Similarity of Problem :

facing common problem.

* Planning region suffers from one or more common problem.

example - Thar desert, Rann of Kuchha suffer from similler problem.

⑧ Administrative convineance - (सुख-सीमे अनुकूलता)

administrative regional boundry

This charactaristics of Planning region originate from dichotomy between administrative boundries and the regional boundries.

⑨ other - (i) Economy harmoney & function unity.

(ii) The region should be internally cohisive.

(iii) There should be a high degree of flexibility and elasticity, in the process of regional delineation.

REGIONAL HIERARCHY

* The planning regions are classified in to micro, meso and macro planning regions.
* These planning regions are classified on the basis of physical, economic and ecological factors.

(a) **Micro Regions:**

(i) micro regions are 'smallest' and 'lowest' level of hierarchy of planning region.

(ii) micro regions are different from adjecent areas interm of certain charactarisitics and potentialities.

(iii) Any small region has potential for the development and promotion to any single specilization such as Agriculture (Punjab plain), Hydropower (HP), Tourism (J&K) etc.

(b) **Meso Region:**

(i) meso region lie at the middle of the hierarchy of planning region combine in themselve a few micro region.

(ii) At least two micro region combined to form one meso region.

(iii) meso region are multipurpose region.
Example: Damodar valley basin.

(iv) meso region posses at least one specialization of production cycle of national importance as well as a number of nodal centre of both national and regional significance.

(v) The main objective of delimiting meso region is to curve out the viable unit for the effective exploitation, conjection and utilizing of resources.

© **Macro Region:**

(i) macro-regions are the largest of all planning regions in the three tier system of planning region.

(ii) It is a large areal unit with greatly diversified natural resources capable of being a self-contained region with a self-generating economy to support a high quality of life.

(iii) They are formed by combined two or more meso regions

Example - South Penninsular Region.

(iv) The size of macro region for planning purpose also can not be standardised.

Regional Hierarchy of India: 13-macro 57-micro e.g. Chandrashekhar

- In 1972 C.S. Chandrasekhara divided India into (13) macro and (35) meso region planning.
- He used the criteria of physical, economic and ecological factor to reach macro scale division of India.

* **Macro Regions are:** ① Jammu & Kashmir and Ladhakh region.
② Trans Indo-Gigantic plain Region.
③ Ganga-Yamuna plain Region.
④ Lower ganga plain Region
⑤ North-Eastern Region.
⑥ Eastern penninsular Region.
⑦ Central Penninsular Region.
⑧ western Penninsular Region
⑨ Central Deccan Region.
⑩ South Penninsular Region.
⑪ Gujrat Region.
⑫ western Rajasthan Region.
⑬ Aravali Region.

1) Jammu-Kashmir & Ladhakh Region:

horticulture & forest based industry.

* Cover entire state of J&K 'Srinagar' was the only prominant urban concentration.
* The resource of the region were limited to 'horticulture' forest based industry & tourism.
* The economic specilization of the regions also lies in its horticulture & forest based industry.

• 2 meso Region: - (i) J&K - (ii) Ladhakh.

2) The Trans-Indo Gangatic plain & Hills Region:

land & agro-based industry.

* It covers area of Punjab, Himachal, Haryana, Delhi, hill district of U.P..
* Delhi, meerut, Ludhiana, Chandigarh are prominant urban / industrial concentration.
* The chief resource of the region lies in good quality agri. land & horticulture apart from this forestry, agro-based industry tourism etc.

• 2 meso region -
- (i) Bhakra-Nangal agro-industrial region.
- (ii) Delhi uttarakhand - western up plain & Hill.

3) The Ganga-Yamuna plain Region:

agricultural potential

* Cover large part of UP & MP, with Kanpur, Agra, Varanasi, Lucknow, Allahbad are main industrial region.
* The main resource of the region lie in rich agriculture potential of the Ganga plain forest of MP.

• 2 meso Region - (i) Kanpur region.
(ii) Bagelkhand region.

4) The Lower Ganga Plain Region:

* It covers northern Bihar and W. Bengal with Patna, Culcutta, & Bauroni as the cheif urban / industrial concentration.

agriculture & petro chemical

* The resource of the region lie largely in agriculture sector (Jute & tea) & Petro-chemical Industry.

- 3 meso region - (i) Northern Bihar Region.
  (ii) Kolkatta - Hooghly Region.
  (iii) North Bengal plain.

5) North-Eastern Region:

* The region cover the entire, north eastern state of India.

7-sister tea & chemical indus

* shilong, Guwahati, Digboi, Tinsukia, as main urban / industrial location.

* The cheif resource of the region lie in Jute cultivation, Tea plantation, forest, Petrochemical, coal, crude oil, horticulture.

* Therefore the main economic specilization are Jute cultivation, coal mining, Petroleum and natural gas, chemical industry.

- 3 meso Region:
  (i) lower shilong region with Jute cultivation.
  (ii) Upper Brahmputra & hill region.
  (iii) Eastern plain & hill region.

Hill → plain & hill
Jute

6) Eastern-Penninsular Region:

* It cover north-eastern deccan coastal plain, the Dandkaranya, the Mahanadi Basin, chotta Nagpur industrial region.

sambhalpur, Vishakhapatanam, cuttak etc. are important prominent urban concentration area.

* The cheif resource potential of region included coastal fisheries, agriculture in mahanadi basin, minerals, forest of 'Dandakaranya' etc.

• 6 meso region:

① North eastern Deccan coastal plain.
② Dandkaranya.
③ Mahanadi basin.
④ Son industrial region.
⑤ Brahmini industrial region.
⑥ Chota nagpur region.

7) The Central Peninsular Region:

* It included part of Karanataka, Goa, & large part of Andra Pradesh.

* Important industrial / urban concentration of the region included 'Banglore' & 'Hydrabad'

rice, agriculture malnad

* The cheif resource of the region included fisheries of coastal belt, agriculture of Andhra plain plantation of malnad & coorg.

* Aernotical industry, tobacco cultivation, tobacco industry were cheif economic specilization of this region.

• 4 meso Region -

① Karanataka coastal & interior region.
② Royalseema & coastal plain region.
③ Bellari - Hospet mining industrial region.
④ Telangana & coastal plain.

8) [illegible] Peninsular Region:

* In this include (8) district of Kerala & (13) district of Tamilnadu.
* Important urban / Industrial concentration is a 'coimbtor
* Kerala: beach sand which included 'Thoriam' ore or 'monazite' reserved of the world.

plantation based industry

* Economic specilization in the field of plantation agriculture as well as plantation based industry.
* Well developed transport network has provide the link bet^n various part of region.

• 3-meso region : (i) Kerala
(ii) Madras - coimbator industrial region.
(iii) Tamilnadu coastal region.

9) The western Penninsular Region:

* It cover the 'Konkan' & Trap agro-industrial area & marathwara area.

agro-industrial

* most prominant urban concentration in 'mumbai.

cotton, sugar & film industry

* The cheif economic specilization of the region included cotton processing & cotton textiles, light engineering industries, film industries.

• 2-meso region - (i) Kokan & Trap-agro industrial region.
(ii) marathwara agro-industrial region.

10) The central Deccan Region:

agro based & industrial cons.

* It covers part of maharashtra, M.P with Nagpur being the most prominant urban / Industial concentration.
* The cheif source of the region included horticulture, cotton cultivation, rich potential for agro-based industries.

2-meso region: (i) Narmada valley region.
(ii) Khandesh Berar Region.

* It included both the Gujrat hill & plains and Kathiwar & Kuchh region.
* Ahmedabad, Vadodra, surat are prominent industrial or urban concentration area.
* The cheif resources of the area included petroleum, chemical, salt, limestone, bauxite.
* In the field of agriculture, cotton, & oilseed are the cheif crop.

• 2-meso region: ① Gujrat hill & plain.
② Kathiwar Kutch region.

12) The western Rajsthan Region:

* Cover arid & semi arid areas of the west 'Aravali's.
* Jodhpur, Bikaner, Ganganagar constitute its main urban concentration.
* Lignite coal, limestone, Gypsum, irrigated minerals.
* Irrigated agriculture specialty along the Rajasthan canal.

• 2-meso Region - ① Desert region. (Indira Gandhi)
② Semi desert region.

13) The Aravalli Region:

* Jaipur, Ajmer, Kota etc. are the important urban/industrial region.
* The cheif resource are included non-ferrous metal, lead, zinc, copper, mica etc.
* Economic specilization non-ferrous metal based industry, irrigation based agriculture, mixed farming, tourism etc.

• 2 meso region: ① Kota chambal region.
② Jaipur - Udaipur mixed farming.

- The region derived from 'Latin' word 'Regio' means space.

* Definations *

① Woolfer -

Homogeneity of physical, economic & socio-cultural

"A region is an area which has a combination of enviormental and demographic features that have created a homogeneity of economic & social structure".

② "An area that is differentiated from other areas according to some specific criteria".

③ "An area having the homogeneity of the physical and cultural phenomena.

④ "The differentiate segment of the earth". - whittlesey.

* There are three categories of delimitation of the Region :

a) Homogenity -

The homogeneity is referance to combination physical, economical and social charactaristics".

b) Nodality -

polarization of activities c.B.D

The second emphasis is called nodality or polarization, usually surround some central urban places. Ex - Central Buisness District (C.B.D)

c) Programming:

'That is related to policy oriented - It may be with administrative or may be political institution for the affective policy designs".

① Formal Region :-

"A formal region an area which delinated on the basis of specified criteria. i.e. social, economic, physiographic."

overlapping completely not

- They are not overlapping & completly exhoust the space

(i) Physical Region -

"The region which demarcated on the basis of physical charactaristics is called physical region."

Ex - Landform, climate, vegetation etc.

(ii) Economic Region -

"When dominant economic activity consider as criteria for demarcated region then it's called economic region".

Ex - Industrial, Agricultural region etc.

(iii) Socio - Cultural Region -

"When the delimiting of regions depends upon the socio-cultural factors are called as socio-cultural region".

Example - Religion, Caste, Tribe, language etc.

(iv) Compage Region -

"The delimiting of regions depends upon the combination of two or more factors are called as compage Region."

- formal regions are delimited on the basis of 'uniformity'.

② Functional Region :

interact on mutual interdependance

"The region which demarcated on the basis of spatial interaction and emphasized functional interdependance (linkage)."

- It is hetrogeneous unit such as cities, Nodes, town & village which are functionally linked.

overlayed / interdepend

Example - ... education, medical, transport etc.

- These region are overlapped & interdependance or linkage.

③ Ad-hoc Region -

"The region which delimited for the certain specific purpose".

Example - Tribal Region, Backward development, water resource development, mineral resources etc.

④ Areal Extent / Level of options :

(i) micro Region -

In the micro regions there is no self reliance. This region are depend upon other regions for development education and food.

Example - village, Tehsil.

(ii) Meso Region -

It is partly high degree of self sufficency regarding food, cloths, employment, education as per individual capacity.

Example - Group of village or Tehsil, District.

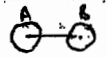
(iii) macro Regions -

This is the biggest region like a river. This are required for planning purpose.

Example - nation, state.

a) **Delination of Formal Region:**

* 'We know that the formal region is based on specific criteria i.e. (i) social (ii) economic (iii) cultural.

* The variation betⁿ the region and other areas.
  i.e. (i) External variation (Betⁿ Region) 
  (ii) Internal variation (within Region) = maximum.

overlapping & completely exhaust

- 'formal region are non-overlapping and completly exhaust the space available.'

* In delination of formal regions, it is sought to find out the similarities, homogeneity and uniformity in localities on the basis of specific criteria.

• Per capita income level used -
  - To analyse it further the economic criterion say per capita income level may be used here.

Let,
R and S two localities with per capita income.
$I_R = I_S$: then it consider in a same region.
If, $I_R - I_S$: very small than we also include in same region.
If $I_R - I_S$: greater than certain limit then they kept in different region.

* Problem arise when we try to delineate region by taking in to account more than one feature.
  - The methods that can be adopted in such case.

① ~~fixed~~

(i) Fixed Index-

- In this method number of characteristics common to regions are choosen.

PCI, Ind. employment

e.g. - Percapita income, Industralization level & unemployment

- An arbitory weight is given to each index & a single weighted mean obtained for each region.

(ii) Variable Index-

different level of activities

- In this method, variable weight assigned to highlighted different level of activities in different region.
- This method is good when the criteria can be compared with each other.

(iii) cluster method -

Homogeneous character of different region

- cluster method is used to detect the homogenous character of the structures of different regional unit.
- For this purpose, a study of income and trade flow can be made.

b) Delineation of functional Region -

economic & social dominate in urban centre

- It is delinated as a result of human organisation or an area under the economic and social domination of urban centre.

(i) Flow Analysis -

- It is baised on an empirical study of flow data, which may refers ~~from~~ to different forms of spatial flows such as, intra-regional, migration, traffic over different part and trade area etc.

C.B.D

with decreasing as the distance

- Each flow would show a decreasing intensity as it becomes more distant from the main centre.
- To highlight the spatial flow, it is used to construct the flow maps, since they are in a better position to illustrate actual line or routes of flow.

(ii) Gravitational Analysis -

- forces of attraction betⁿ centres insted of actual flow is studied.

directly proportional - size
inversely proportional - distance

Economic force at any point of space is directly proportional to the size of force and inversely proportional to the distance betⁿ source.

* Gravitational force betⁿ two centre 'a' & 'b' -

mass = poplⁿ, employment, income.

Distance = Road, Air, time, money distance.

$$G_{ab} = K\left[\frac{M_a M_b}{d^2_{ab}}\right]$$

where,

G_{ab} = Gravitational force betⁿ centre 'a' & 'b'.

$M_a M_b$ = masses of centre a & b.

d_{ab} = Distance betⁿ two centre.

K = constant.

- This method calculate the potential for the centres in a study area and plot contour lines of equal potential on a map.

- Gravity potential model can be used for regional delineation.

Regional Planning

* Regional planning is the instrument through which optimal distribution is brough about.
- In the countries where size, pattern and places of investment are determined by sectoral units; under the overall supervision of national planning authorities.

* The role of Regional Planning passive and is reduced to the following activities:
  ① To register the distribution of investment decision made by the sectoral unit.
  ② To analyse the impact of the decision on the development of different regions in a gave country.
  ③ To indicate how the sectoral investment decision can be integrated at the regional level. and what advantages can be achived by the integration.

* Framework of Regional planning:

The regional planning is only an instrument to improve the sectoral effiency of the investment process.

* Thus regional planning help in the two manner:

improve human activity & reduce disparities

① Improve the distribution pattern of human activity.
② Reduce the disparities betn the rich and the poor regions of the country.

* Importance of Framework of Regional Planning -

- (i) National plan or regional plan designed.
- (ii) Growth of certain region & while other.
- (iii) Infrastructure development.
- (iv) plans for economic activity.

* Schemes of Regional Planning:

1) V. Nath:
- In 1964 based on elements are - (i) Geographical (ii) Agricultural (iii) crop system.
- Physical & administrative boundries are used.
- Total India divide in to 15 regions.

2) Prof. L.S. Bhatt & S.K. Rao:
- Delination of regions in District level by (i) Agricultural used land (ii) Natural product.
- India dilineation boundries of total 17th regions.

3) Prof. Sen Gupta -
- Regions Delinations based on (i) Natural Resources, (ii) Industrial Development. (iii) Social & economic Development.
- India division on main 'three' groups & sub-region - 19.

Definations:

① friedman:

"Planning is primary way of thinking about social, economic problem".

- Planning is pridominantly feature oriented.

② Planning commition of India -

"Planning is essentially an attempt at working out a rational solution of problem".

③ "The term planning means taking decision to implement them in order to attain economic development"

* Constituent of plan:

- (i) Problem Identification - firstly problem identified,
- (ii) Objective accepted - which work done by objective,
- (iii) Sources - primary data source or secondary data.
- (iv) Priority - (a) contegency minimum time of maximum work
- (v) Plan model - (a) contregency (b) consistancy (c) completness.

* Goal of Planning:

1) To reduce the poverty.
2) social upliftment.
3) Economic improvment.
4) Enviormental improvment.
5) General upliftment of region.

* Regional Planning arising certain problem:

① Rapid population growth. / popl^n explosion.
② Increasing organisation.
③ Increasing standard of living. / urbanizat^n

⑤ Different industrial region's are different problems.
⑥ Slum area planning.

Types of Planning:

1) Short Term & Long Term Planning -
certain planning goal of society
- It is 'temporal point' of view the planning.
- Short term is design to solve certain planning.
- Long term structural & Industrial changes, achiving social & economical goal of society.

2) Economic & Development Planning -
sc - developed
about developing third countries
- It is status of level point of view the planning.
- The economic planning suited in developed countries.
e.g. U.S.A, W. European countries.
- The development planning is applied developing countries.
e.g. - India, china, African & S. American countries.

3) Imperative (आदेशात्मक) & Indicative (सूचक) Planning -
sc - public sector
s. private
- Imperative planning apply in public sector (goverment), here private sector is negligible.
e.g. most of mine production by goverment.
- Indicative planning by private sector; it is a co-oprations of public sector.

4) Normatic and systematic Planning:
sc - planner
sbc - social
- Normative planning is based upon planners, defining goals & objectives.
- systematic planning as a social process operating in socio technical context.

5) Sectoral & Spatial planning -

- Sectoral plan design to develop various sector of economy e.g - Agriculture, transport, trade.
- Spatial planning is based on recognisation of the impact of general trend of development.

6) Single-level and multilevel planning -

single level- under developed & multilevel-developed

- Single level planning apply in underdeveloped countries, alone lower territorial level. Because absent technical leadership & lack of institutional framework.
- Multilevel planning apply in developed countries at several territorial level.

Factor - size of country, physical geography, administrative pattern, regional structure.

7) multi objective & single objective Planning -

multi- various

single- highly problematic

- It is select various objects for planning purpose.
  e.g. - Development regarding social, economic, educational and agricultural etc.
- It is select highly problematic object to planning purpose.
  e.g. - Irradicate the poverty, drinking water problem etc.

① Planning Commition of India:

"Planning is essentially an attempt at working out a rational solution of problem".

② "Regional planning is determined as feature action for development of perticular sector of the earth".

* Regional Planning is a specific type of planning, for inducing public action aimed at societal well-being.
- Regional Planning may be organising the regional space for ideal living conditions to all human communities in all regions.

* Need of Regional planning -

I) To reduce regional disparities.
II) To control popln growth.
III) To resolve the critical problem.
IV) To development transportation and communication.
V) To economic & Technological development.

- The success of a regional plan in any country depends upon -
  1. The quality of planning education.
  2. The degree of public awarness about the rationale for planned effort.
  3. The efficency of Planning institution.
  4. The proper comprihension and appreciation of the basic issues involved in regional planning by the society.

Functions of Planning Commission of India:

1) - To formulate five year / annual plans.
2) - To supervise the work of national planning.
3) - To consider the national plans formulated by the Planning Commision.
4) - To recommend measures for achieving the targets set out by the plans.
5) - To review working and monitor the plans from time to time.
6) - To encourage people's partieipations in the planning processes.

Regional Planning Hierarchy/Level in India:

The scope of regional planning in India is limited, due to fact that political entities; The purpose of planning can only serve an advisory role.

a) Inter-state Level planning:

① Damodar valley Project -

It involve the state of Bihar, W. Bengol, and the centre and has multipurpose to serve such as irrigation, flood control, power etc.

~~② South-East Resource Region -~~

② Bundelkhand - The region M.P (six district), U.P. (5 district). It serve to overcome the problems of scarcity of water, low level agriculture activity, lack of industries & poor communication.

③ Western Ghats:

It involves the states of Goa, Gujrat, Maharashtra, Karanataka & Kerala. It serve the purposes of afforestration, plantation agriculture, hydel power, development, mineral resource development and wild life protection.

4

④ North-East Region:

It involves seven states of Aassam, Tripura, Arunachal, Mizoram, Meghalaya, Nagaland. It problem arises inaccessibility, difficult terrain, poor infrastructure, soil erosion, flood, Low PCI etc.

b) State Level Planning:

In 1972 strenghten state level planning machinary with special area target approch called 'decentralization'.

① Planning for Drought prone Areas -

minimize drought

- These area are charactrized by low productivity which cause regional imbalance,
- objective of programe minimise advers affect of drought.
- Programme were development & scientific managment of resourres, land improvment, soil conservation, Afforestration etc.

② Desert Development Programme -

- The programme was started both in:
  - (i) Hot desert areas - Rajsthan, Gujrat, Haryana etc.
  - (ii) Cold desert areas - J&K and Himachal Pradesh.
- effect of desertification on crops, human and livestock population.
- Programme on water managment, agriculture development, Afforestration.

c) **District Level Planning :**

The decentralized district level planning -

1. Problems can be properly assessed.
2. monitoring of the ongoing projects is more effective.
3. synchronisation among various projects can be properly ensured.
4. systematic district level planning can well ensure establishment of state level infrastructure.
5. Stimulate economic growth in the hinterland.

d) **Local Level Planning -**

This helps to serve the following objectives -

1. Optimum utilization of resourres.
2. Development benefit to the poor.
3. Fulfilling basic needs of the people.
4. Expanding economic & social structure.
5. Higher level of productive employment.

* **Regional Planning in India divided in to '5' phases :**

Phase	Period	Major changes
I	1950 - 60	Community Development Programme.
II	1960 - 70	Panchayati Raj phase.
III	1970 - 80	Block Level Planning.
IV	1980 - 90	District planning, IRDP & Employment Generation Programme.
V	1990 - 2001	Renaissance of Panchayati Raj system.
VI	2001 - 2010	Rural Development and Rural Planning.

Objectives of Regional Planning in India:

- Planning is a method of acheving economic prosperity by the optimum utilization of the resources of a region or country.

i) To increase regional income of the geospatial region.

CONCEPT OF DEVELOPMENT

* Defination :

① "Development means changes in desired direction and as a desired speed".

② "Development means 'remove the inequalities' among the person, region and state"

* Factor controlling / Affecting Development -

1) Physical Resources -

- There is a +ve relationship bet^n quantity, diversity & quality of resources and regional variation in level of development.
- The region which has full of resource they have greater potential to development.
  e.g - U.S.A., Aussia.

2) Technology -

- Technology refers to quality upgradation of both goods and services.
- There is +ve relationship bet^n level of development & technology advanement.
- The western countries are very advance in technology so they are consider as developed country.

3) Social structure :

- The social organisation & social institution in society both impact upon development.
- 'Ethinic tension' are said the negative correlation with economic health of region.
- Area having strong urban-rural linkages have higher level of development as a positive correlation.

4) Economic Structure :

- Economic structure of region interm of share of primary, secondary, Tertiary & quaternary sector of economy concern with development.
- Higher the share of primary sector in a region economy, lower is it's GRP implying a negative co-relation betⁿ the two.
- The regions which large no. of people engage in non-primary activities concerned in developed region because there GRP high.

5) Political Set up :

- Political set up of region interm of degree concentration/ decentralization of power & it's expression in the form of monarchy, feudalism, capitalism, Democracy etc.
- It is said that, per capita GRP has strong correlation with the nature of political organization a region.

e.g - Strong +ve' correlation betⁿ per capita GRP & degree of democratic institution.
Negative correlation the percapital GRP & degree of dectatorial tendancies.

Indicator of Development :

(a) Agriculture Development -

"Agricultural development connotes the 'quality of functionig of agricultural system' of a region interm productivity, diversification, commercilization, ecological balance" etc.

(i) Cultivated land per agricultural workers.
(ii) Intensity of cropping.
(iii) Intensity of Irrigation.
(iv) Consumption of fertilizer per hector of net area sown.
(v) Area under HYV as percent of cropped area.

(v) Tractor per thousand hector of net area sown.
(vi) Irrigation pumping set thousand of net area sown.
(viii) Agriculture production per agriculture worker, per cultivar or per hector of net area sown.

b) Industrial Development :

"Industrial development can not quality of functioning of the regions industrial system in terms of size, structure, organisation, location pattern & it's impact on the enviorment".

(i) No. of functional industrial unit / lakh popl^n.
(ii) No. of functional factories / 100 km^2
(iii) % of Industrial worker to total worker.
(iv) % of share of industrial sector in the total revenue of the region.
(v) Workers, Investment & Production in large scale and medium scale industries.
(vi) % of workers in registrated & unregisted factories.
(vii) % of production in registrated & unregisted factories.

c) Social Development :

It include educational, Health and transport & communication development.

(1) Education -
(i) No. of educational institute of various level per 100 sq. km.
(ii) No. of educational institute of various level per 1000 popl^n.

(2) Health -
(i) medical institution / lakh popl^n.
(ii) villages having hospitals & dispensaries as % of total villages.

③ Communication & Transportation -

(i) Post office of / Hundred of sq. km. area.
(ii) Post office of / lakh popln.
(iii) % of Pucca road of total inhabited villages.
(iv) Railway length (K.m) / 100 sq. km.
(v) No. of bank / lakh popln.
(vi) No. of electrified villages of total villages.

④ Demographic Development:

(i) % of urban popln of total popln.
(ii) % of literate popln of total popln.
(iii) % of primary sector worker out of total popln.
(iv) % of non-primary sector worker out of total popln.
(v) % of worker in serveces out of total worker.

* Planning Commision of India:

give the follwing indicator of development.

(i) Value of material & per capita income.
(ii) Consumer expenditure per person.
(iii) population density / mile^2.
(iv) Proportion of people living in rural areas.
(v) Employment in organized industries.
(vi) Agriculture & irrigation.

Choice of Indicator - The choice of indicator should be such that no indicator the ~~-ve~~ indicator, we have select only '+ve' indicator.
e.g. - Infrastructure, health, education etc.

Measurment of Regional Disparities / Level of Development:

- Some of the important technique in the measurment of disparities:

a) Composite Index Method –

① By taking Single indicator - e.g. Agriculture or Industrial

$$C.D.I = \frac{P_i}{P_I} \times 100$$

where,
CDI = coefficient of development factor 'i'
P_i = % of factor 'i'.
P_I = mean % value factor in the whole region.

② By considering all the indices of development -

$$C.I.D = \frac{Cdi_1 + Cdi_2 + Cdi_3 + \dots + Cdi_n}{N}$$

where, CID = Composite Index of development.
N = No. of variables.
Cdi = Coeffecent of development factor 'i'.

b) Normalization / standardization method:
– Prof. Kundus Method.

- We have select the indicator for measuring the development.
- If we ~~add~~ the values this indicator directly.
- The technique of division by mean i.e. $\bar{x}$ suggested by 'Kundu' is used by this purpose.
- After arranging these composit index values on decending order.
- Indicator divded by these corresponding mean.
- Higher the value higher the development of region.
- You make can understand developed, moderate & backward level of region.

$\bar{x} = \frac{\Sigma x}{n}$, Indicator, Horizontally value added, Decending order, level of

c) **Ranking Method :**

- Prof. Ashok Mitra.

- we select some of the indicator e.g.- socio-cultural, and economic prospect.
- We calculate the ranks of the values of each indicator.
- Finally added the rank of each observation of each indicator, putting rank in decending order.
- If ranks are 1, 2, 3 .... n highest value and large.
- The 'lower is the value higher is the development' and vieversa.

d) **'Z' score method -**

- In this method score of each areal unit is divided by the avarage for region as a whole, to calculate what is known as 'Z' score method.
- Summation of 'Z' score for all the indicator of each areal unit indicate the level of development, Higher the value higher will be the development.
- 'Z' score also calculated alternatively by substracting mean from actual value & dividing it with S.D.

① mean ⑪ ⑪ ⑭ where, $S.D. = \sqrt{\frac{\Sigma(x-\bar{x})^2}{n}}$

$\bar{X} = \frac{\Sigma X}{N}$; $(x-\bar{x})$; $(x-\bar{x})^2$ $\frac{x-\bar{x}}{S.D.}$ ....

Strategies for Development:

There are many dimention of development -

① Sectoral Development -

It refers to the development of various sector of economy. e.g- Agriculture, Industrial etc.

② Sectional Development -

It refers to the development of different segment of the society. e.g - tribe, sc popln etc.

③ Spatial Development -

It refers to spatial aspect of all these development. e.g - rural, urban, block etc.

a) Strategies for Agricultural Development -

"Agriculture development refers to the quality of functioning of agriculture system in terms of agriculture productivity, diversification, commercilization of agri. & it's interface with ecology of concerned region".

* Agriculture development of region guided by physical, social, economic, circumstances of concerned region.

* Objective of Agriculture Development:

(i) To improve total food supply of the region.
(ii) To improve consumption level of all inhabitant interm of quality of nutrition.
(iii) To generate additional employment.
(iv) To provide HYV of various crops.
(v) To provide insurance scheme of different crop.
(vi) To provide adequate market facilities in country side.

* Strategy for Agriculture Development -

need to upon 3 major factor -

(i) Institutional factor -

Institutional factor include land reform say consolidation of land holding, celing on land holding tenancy reform, credit facilities, market facilities etc.

(ii) Technological Input -

It include both biotechnological & mechanical.

a) Biotechnological - HYV seed, fertilizer etc.

b) mechanical - tractor, harvest, irrigation etc.

(iii) spatial framework to achive the above objective.

b) Strategies for Industrial Development -

Objective - → Rapid economic growth.
→ Generation of employment opportunities.
→ Strengthing of both backword & forword linkages.
→ making the industrial development the basis of national development.

* In agricultural country like India should be focus on industrial development has to be agri. oriented.
e.g - Plant of fertilizer.

* The strategy of industrial development should be able to top agri. incomes for industrial development in the countryside.

* There shall always be lobbies in support of small scale industries or large scale industries, privitation, public sector dominance, labour intensive, capital intensive, foreign investment etc.

REGIONAL IMBALANCE IN INDIA

• Meaning-

disparities in soc.

① "Regional imbalance may be defined as disparity in the standerd of living which exist within a nation or across the nation."

② "Regional imbalance refers to the spatial variation in the level of economic wealth, standerd of living and quality of life within component regions of national territory."

* It is generally trend that per capita income is generally taken as factor to show the disparities bet^n the region or state.
- But only percapita income not show the overall disparities existing bet^n state or region.

* There are other indicator such as industrial development, agricultural growth, level of literacy sector, urbanisation, infant mortality rate etc.

ⓐ Percapita income (2007-08) -

(i) Punjab - 44,411
(ii) Haryana - 58,331 High
(iii) Goa - 96,876
(iv) Bihar - 10,573 Low
(v) Orissa - 23,403
INDIA : 37328

ⓑ Industrial Sector-

The concentration of Industries in W.Bengal, Maharashtra, Gujrat & Tamilnadu.

1) Developed state in Industries: (1965)

Maharashtra, Tamilnadu, Gujrat & W. Bengal are-

(i) Population - 29%.
(ii) Capital - 47%.
(iii) Employment - 59%.
(iv) Production - 62%.

2) Backward states in Industrial Development-

Bihar Uttarpradesh and orissa,

(i) Population - 31%.
(ii) Capital - 21%.
(iii) Employment - 14%.
(iv) Production - 18%.

(c) Agricultural sector-

① Per capita food grain output (1995-95)

(i) Punjab - 968 kg
(ii) Haryana - 877 kg
(iii) Uttarpradesh - 253 kg
(iv) Rajsthan - 181 kg
INDIA - 197 kg

② Fertilizer consumption -

(i) Punjab - 167 kg/hect.
(ii) Hariyana - 123 kg/hect.
(iii) Aassam - 28 kg/hect.
INDIA - 74 kg/hect

(d) Village of Electrification :

(i) Punjab - 100%.
(ii) Haryana - 100%.
(iii) Himachal Pradesh - 100%.
(iv) Rest of state - 80%.

(e) Infant mortality rate :

(i) Kerala - 18 / 1000 live birth.
(ii) Orissa - 110 / 1000 live birth.
(iii) Bihar - 70 / 1000 live birth.
(iv) M.P. - 106 / 1000 live birth.
INDIA - 74 / 1000 live birth.

(f) Literacy (2001) :

(i) Kerala - 90.9%.
(ii) Bihar - 47.0%.
(iii) Rajsthan - 60.0%.
(iv) Himachal - 76.5%.
INDIA - 64.8%.

(g) Infrastructure :

Dec. 06

- Social & economic Infrastructure prepared by the Eleventh finance commision.
- Bihar, M.P., Orissa, Rajsthan & most of the NE states are ranked low index.
On the other hand Punjab & Gujrat, Goa better infrastructure.
- The scheme like 'Bharat Nirman' announced by the finance minister in his Budget speech for (2005-06) vision to build infrastructure in rural india reduce inequalities.
- 'Bharat Nirman' has six components : Irrigation, roads, water supply, housing, rural electrification & rural connectivity.

* Causes of Regional Imbalances -

(i) Uneven distribution of Resources.

(ii) Lack of resources.

(iii) Lack of technology.

GROWTH	DEVELOPMENT
(i) The term 'Growth' quantitative' in nature.	(i) The term development 'qualitative' in nature.
(ii) Growth means simply increase in quantity. e.g - Increase in total income, Percapita income.	(ii) Development means changes in desired direction and as a desired speed.
(iii) Growth do not remove inequalities.	(iii) Development remove inequalities of region or state.
(iv) Economic Growth is primarily concerned with the increas in income.	(iv) Development embraces all aspects of human life - economic, social, cultural or political.

June 05

HUMAN DEVELOPMENT

- The united Nations Development Programme (UNDP) published its first Human Development Report in 1990.

* **Definations:**

(i) 'Human development was defined as long and healthy life, proper education, standerd of living, political freedom, guranted human rights, and are the additional choices'.

or.

(ii) 'Human Development is a process of widening people's choices as well as raising the level of well being'.

• **Paul Streeten, H.D. is necessary due to -**

(i) To improve the human conditions & enlarge people choices.
(ii) It is a major tool of achieving higher level of productivity.
(iii) It helps reducing growth of popln.
(iv) It is friendly with physical enviorment.
(v) Improve living conditions & reduce poverty.
(vi) It helps in reducing civil disturbances in the society & increasing political stability.

* **Indicators of Human Development:**

1) **Health Indicators -**

(i) To longitivity of birth rate
(ii) Death rate with special reference to infant mortality.
(iii) nutrition.
(iv) life expectancy at birth.

2) **Social Indicators -**

(i) include literacy particularly female literacy.
(ii) enlorment of school going children.
(iii) Drop out ratio.
(iv) pupil - teacher ratio.

- Development of Human Resources is necessary mainly because people can develop the natural resources.

3) Economic Indicators -

(i) related to wedges
(ii) income per capita.
(iii) employment opportunity.
(iv) Poverty. etc.

* Computing the HDI :

① Life expectancy at birth : 25 years and 85 years.
② General literacy rate : 0% and 100%.
③ Real GDP per capita : PPP$ 100 and PPP$ 40,000.

- HDI is a simple average of these three indices, its value ranges from 0 to 1.

* HDI of India :

Global positions of India with respect to H.D.

Country	Human Development Index (HDI) Rank	HDI	Life expentancy (years)
Norway	1	0.95	79.4
Iceland	2	0.92	80.7
Australia	3	0.74	80.3
Sri Lanka	93	0.74	74.0
India	127	0.59	63.3
Pakistan	135	0.49	63.0
Nepal	136	0.50	61.6
Bangladesh	139	0.50	62.8
Sierra Leone	176	0.34	40.8
Niger	177	0.29	44.4

(Source : UNDP H.D.R 2005).

- India's ranked 127 out of the 177 countries.
- South Asian countries, India ranks 3rd after maldives (84), Sri lanka (93). Pakistan, Nepal & Bangladesh worse India.
- Norway, Iceland & Australia to three performances.
- Burkima faso, Sierra Leone, & Niger have worst human development.

(a) Health Indicators :

(i) Crude birth rate - 25.0 (2002)

(ii) Crude death rate - 8.1

(iii) Life expectancy - 63.3

(b) Literacy - Indicators :

1) Total literacy - 64.8%. (2001)

(i) male literacy - 75.30%.

(ii) female literacy - 53.70%.

Kerala (90.9) - highest M (94.2), f (87.7)

Bihar (47.0) - lowest M (59.7), F (33.1)

2) Elementary Education - (I-VIII)

Boys - 85.4%, Girls - 79.3%. Total = 82.5%.

3) Adult education -

(i) 15 yrs & above (Adult) - 61.3%.

(ii) 15 yrs - 24 (Youth) - 73.3%.

(c) Economic Indicators :

Poverty Ratio - 19.3%.

Rural - 21.1%.

Urban - 15.1%.

* Interstate variation in HDI (2001)

Kerala - 0.638	U.P. - 0.388
Himachal - 0.680	M.P. - 0.394
Punjab - 0.537	Assam - 0.386
Maharashtra - 0.523	Bihar - 0.367

India - 0.472

Planning Commission -

- स्थापना - 15 मार्च 1950.
- अध्यक्ष - प. जवाहरलाल नेहरू
- पंतप्रधान आयोगाचे पदसिद्ध अध्यक्ष असतात.
- National Development Council - आर्थिक नियोजन मंजुरीला व कार्यवाहीचे होण्यासाठी व राज्यांना सल्लागारी उत्तम होण्यासाठी 6 Aug 1952 रोजी NDC ची स्थापना झाली.

I

1) 1st Five Year Plan - (1 April 1951 - 31 march 1956) 'पुनर्रचना योजना'

अध्यक्ष - प. नेहरू

सार्वजनिक क्षेत्रापैकी सर्वाधिक खर्च कृषी व जलसिंचनावर होता.

कृषि योजना

* उद्दिष्टे - (i) दुसरे महायुद्ध व फाळणीतून सावरणे.
(ii) देशात उपलब्ध असलेल्या साधन सामुग्रीचा जास्तीत जास्त वापर करुन रोजगार वाढवणे व राहणीमानाचा दर्जा सुधारणे
(iii) चलन फुगवट्यावर नियंत्रण.

अर्थ - कृषी - 31%, उर्जा - 12%, उद्योग - 8%, वाहतूक - 27%, सामाजिक सेवा - 22%, आर्थिक - 2.1%, साधन - 3.5%

पुनर्रचना योजना

* मुख्य -

(1) दामोदर	- दामोदर नदी झारखंड व प. बंगाल	U.S.A मदतीने टेनेसी पुनर्रचना आधारित.
(2) भाकरा-नानगल	- नदी - सतलज, राज्य - हिमाचल व पंजाब	
(3) कोसी	- नदी - कोसी, राज्य - बिहार	
(4) हिराकूड	- नदी - महानदी, राज्य - ओरिसा	
(5) सिंदरी फर्टिलायझर्स	- आशियातील पहिला, झारखंड	
(6) चित्तरंजन रेल्वे इंजिन	- प. बंगाल	
(7) हिंदुस्थान अँटीबायोटीक्स	- पिंपरी, पुणे.	

2) 2nd Five Year plan : (1 April 1956 - 31 march 1960) 'औद्योगिकवादी योजना'

उद्योग योजना
mahalanobis model
औद्योगिकवादी योजना.

अध्यक्ष - पं. नेहरू. मुख्यमंत्री - मुलमूल व जडउद्योग

- सार्वाधिक खर्च वाहतूक व दळणवळणावर - प्रतिमान : पी.सी. महालनोबिस

उद्दिष्टे - (i) समाजवादी समाजरचनेच्या तत्वांचा विकास.
(ii) प्रतिवर्षी विकासाचा दर - 4.5%, साध्य करणे.
(iii) जड व मुलभूत उद्योगांची स्थापना करुन औद्योगिकरण.

GDP:
सेक. - 4.5%.
शास्त्र - 4.2%.
खर्च: 4600 crore.
वाहतूक - 28%.
उद्योग - 24%.
कृषी - 20%.
सामाजिक - 18%.
इतर - 10%.

* प्रमुख :
① Bhilai steel - (1959) रशियाच्या मदतीने
② Rourkela steel - (1959) प. जर्मनीच्या मदतीने ; ओडिसा येथे
③ Durgapur steel - (1962) ब्रिटनच्या मदतीने ; प. बंगाल येथे.
④ BHEL (Bharat Heavy Electricals Ltd.) - Bhopal.
⑤ Nangal Fertilizers - Punjab
⑥ Rourkela Fertilizers - Orisa.

* संकटे : ① सुरक्षा खर्चाचा प्रश्न ② मोसमी पावसाची कमतरता ③ परकीय चलनाचा साठ्यात घट ④ किंमतीचा निर्देशांक 30% वाढला.

37 IIIrd Five Year Plan : (1 April 1961 - 31 march 1966) ~~कृषी व उद्योग योजना~~

GDP -
अपेक्षित - 5.6%
साध्य - 2.8%
खर्च - 8577 cr.
वाहतूक - 25%.
उद्योग - 23%.
कृषी - 21%.
सामाजिक - 17%.
इतर - 14%.

मुख्यभर : कृषी व मूलभूत उद्योग.
अध्यक्ष : पं. नेहरू (1961-64), लालबहादूर शास्त्री (1964-66).
- सर्वाधिक खर्च वाहतूक व दळणवळणावर झाला.
प्रतिमान : Mahalanobis model & Sukhmoy Chakravarti model.
उद्दिष्टे - ① स्वावलंबी व स्वयंपूर्ण अर्थव्यवस्थेची निर्मिती.
② विकासाचा दर 5.6% साध्य करणे.
③ संधीची समानता ④ रोजगार निर्मिती.
Integrated Agri. Area Programme.
* योजना : Food Corporation of India (FCI) - स्थापना (1965)
संकटे : ① चीनयुद्ध (1962) ② पाकिस्तानयुद्ध (1965) ③ दुष्काळ - (1965-66)

** योजनेची सुट्टी : (1 April 1966 - 31 march 1969.) 'Holidays Plan'
- अतिरिक्त हंगामात हरित क्रांतीचा प्रयोग. 'स्वावलंबन योजना'
- डॉलर व रुपीयमन चलनाच्या तुलनेत रुपयाचे अवमूल्यन 36.5% घडून आणले.
- हरितक्रांतीचे जनक - नॉरमन बोरलॉग
भारतीय जनक - एम. एस. स्वामीनाथन व सी. सुब्रह्मण्यम

* Growth Pole - 'F. Perroux'

'A Region Growth Pole as defined, A set of expanding industries located in an urban areas and including further development of economics activities throughout its zone of influence'

* Growth Centre:

The growth centre is a place which acts as pulling effects for development of a region.

* Ex; establishment of an industrial region around an agricultural belt attracts the region by local people and hence holistic development takes place.

4] IV th Five Year Plan: (1 April 1969 - 31 march 1974)

'स्थैर्यासह आर्थिक वाढ'

* अध्यक्ष - इंदिरा गांधी
* मुख्यमंत्र - स्वावलंबन सार्वजनिक क्षेत्राच्या प्रस्तावित खर्चाची विभागणी.
- सर्वाधिक खर्च कृषी व जलसिंचन यावरचा
* प्रतिमान: Alan Maan and Ashok Rudra model.
योजनेचे नाव: गाडगीळ योजना 'स्थैर्यासह आर्थिक वाढ'.
* उद्दिष्टये: (i) स्वावलंबन
(ii) सामाजिक न्यायासह आर्थिक वाढ.
(iii) समतोल प्रादेशिक विकास.
* योजना:
(i) DPAP: (Drought Poone Area Program) 1973
(ii) SFDA: Small Farmer Development Agency - 1974-75
(iii) Bokaro steel plant - रशियाच्या मदतीने.
(iv) SAIL: Steel Authority of India.
* संकटे: (i) भारत-पाक युद्ध, बांग्लादेश निर्वासितांचे निर्वासितांचा प्रश्न.
(ii) 1973 - तेलाच्या किमती 400% वाढल्या 'Oil crisis'.

Bokaro plant
DPAP
Gadgil plan

5] V th Five Year plan: (1 April 1974 - 31 march 1978)

'दारिद्र्य निर्मूलन व स्वावलंबन'

* अध्यक्ष - इंदिरा गांधी
* मुख्यमंत्र - गरिबी हटाव / दारिद्र्य निर्मूलन व स्वावलंबन
* खर्च - सर्वाधिक खर्च कृषीवर.
GDP - संकल्पित - 4.4%, साध्य - 4.7%.
योजनाखर्च - 39,426 crore - उद्योग (28%), कृषी (22%), ऊर्जा (19%)
वाहतूक (18%), सामाजिक सेवा (17%)

* उद्दिष्ट्ये - (i) आर्थिक वाढीचे लक्ष्य - 4.4% (ii) दारिद्र्य निर्मुलन
(iii) उत्पादक रोजगार वाढ.

* प्रतिमान : Alan Maan & Ashok Rudhra model - D.D. Dhar plan.

* योजना :
(i) TRYSEM : तरुणांच्या स्वयंरोजगारासाठी प्रशिक्षण कार्यक्रम.
(ii) पहिले लोकसंख्या धोरण - 1976 ला जाहीर.
(iii) ग्रामीण क्षेत्रविकास योजना - 1975-76.
(iv) Deseart Development Program - 1977-78.
(v) 26 जून 1975 - राष्ट्रीय आणीबाणी जाहीर.

सरकती योजना (Rolling plan) -
- 1 April 1978 - January 1980

* अध्यक्ष : मोरारजी देसाई.

* Rolling plan - Gunnar mirdal : 'Indias Economic planning in its Broader' मध्ये मांडली.

* योजना - कामाच्या बदल्यात अन्न (Food for work).

* District Industrial centre :
- देशपातळीवर रोजगारासाठी पहिली योजना.
- लघु व कुटीरउद्योगासाठी - जिल्हावार केंद्राची स्थापना.

6] VI^th Five Year Plan : 'दारिद्र्य निर्मुलन व रोजगार निर्मिती'
(1 April 1980 - 31 March 1985)

* अध्यक्ष - इंदिरा गांधी (1980-85) राजीव गांधी
* मुख्य भर - दारिद्र्य निर्मुलन व रोजगार निर्मिती.
* खर्च - सर्वाधिक खर्च कृषी (28%).
* उद्दिष्ट्ये - (i) 3 कोटी 60 लाख लोकांना रोजगार निर्मिती
(ii) आर्थिक वाढीचा लक्ष्य दर - 5.2%. आर्थिक सुधारणा - 1991
(iii) आर्थिक व तांत्रिक स्वावलंबन.

* योजना : (i) IRDP (1980) - एकात्मिक ग्रामीण विकास कार्यक्रम.
(ii) NREP (1980) - राष्ट्रीय ग्रामीण रोजगार कार्यक्रम.
(iii) ग्रामीण महिला व मुलांचा विकास (DWCRA) - देशमाईच्या मदतीने.
(iv) Vishkhapatanam steel plant - Andhra
(v) Salem steel plant - Tamilnadu.

7] VII Five Year Plan - (1 April 1985 - 31 march 1990) 'रोजगार निर्मितीजनक योजना'.

* अध्यक्ष - राजीव गांधी
* प्रतिमान : ब्रह्मानंद आणि बकिल मंजुरी वस्तू प्रतिमान. 'रोजगार निर्मितीजनक योजना' - अन्न, रोजगार व उत्पादकता.
* योजना -
  (i) इंदिरा आवास योजना (1985-86)
  (ii) DWCS - दुष्काळ विकास योजना.
  (iii) CAPART - Council of Advancement of Peoples Action & Rural Tech.
  (iv) JRY - जवाहर रोजगार योजना
  (v) NRY - नेहरू रोजगार योजना.

दोन वार्षिक योजना / Years plans -
- 1 April 1990 - 31 march 1992.

(i) व्यवहार तोलाचे संकट
(ii) परकीय चलनाचा अत्यल्प साठा
(iii) चलनवाढीचा दर - 13.7%. होता.
(iv) उद्योग क्षेत्रात मंदी.

8] VIII th Five Year Plans : 'मनुष्यबळ विकास योजना'
(1 April 1992 - 31 march 1997)

* अध्यक्ष : पी.व्ही. नरसिंहराव
* उद्देश : सर्वाधिक खर्च झाला (GDP)
* मुख्यमंत्री : मानवी विकास योजना किंवा मनुष्यबळ विकास योजना.
* प्रतिमान : John W miller model, Rao-Manmohan plan.
* उद्दिष्टे : (i) लोकसंख्या वाढ नियंत्रण
  (ii) रोजगार संधी निर्माण.
  (iii) 15-35 वयोगटातील सर्वांना प्राथमिक शिक्षण.
  (iv) स्वच्छ व पिण्याचा पाण्याचा पुरवठा.
* LPG : Liberalization, Privatization, Globalization
3-स्था-जा : उदारीकरण - खाजगीकरण - जागतिकीकरण

* योजना :

① Rashtriya mahila Kosh. (1992-93)
② SJSRA (Supply of Improved Tools of Rural Artisans)
③ EAS - आश्वासित रोजगार योजना.
④ PMRY - पंतप्रधानांची रोजगार योजना.
⑤ Mahila Samridhi Yojana. - 1993.
⑥ MPLADS
⑦ National social Assistant Program.
⑧ Mid-Day meal scheme.
⑨ Sangam scheme - अपंग व्यक्तींना सहाय्य.
⑩ Ganga Kalyan Scheme

9] IX^th Five Year Plan : (1 April 1997 - 31 march 2002)
'सामाजिक न्याय व समानतेसह आर्थिक वाढ'

* अध्यक्ष - देवेगौडा, I.K. गुजराल
* मुख्यमंत्र - कृषी व ग्रामीण विकास. 'सामाजिक न्याय व समानतेसह आर्थिक वाढ'
* उद्दिष्टे - ① राहणीमानाचा दर्जा ② उत्पादनक्षम रोजगारनिर्मिती
③ प्रादेशिक समतोल ④ स्वावलंबन.

* योजना -
① सर्व शिक्षा अभियान - शिक्षण व क्षेत्राचा मुलांसाठी कक्षा सक्ती करणे
② बालिकासाठी - आंबेडकर योजना - मोफतपरीक्षेतील लोकसंख्येसाठी मुलीसाठी.
③ कस्तुरबा गांधी योजना - मुलीच्या शाळा स्थापन करणे.
④ प्रधानमंत्री ग्रामसडक योजना - 25 Dec. 2000.
⑤ प्रधानमंत्री ग्रामोदय योजना - 2000-01

10] X^th Five Year Plan - 1 April 2002 - 31 march 2007 'शिक्षण योजना'

शिक्षण योजना
अध्यक्ष - अटलबिहारी वाजपेयी
- सर्वाधिक खर्च सामाजिक क्षेत्र (22%)
* उद्दिष्टे - ① बाल व माता मृत्यु प्रमाण कमी करणे
② दारिद्र्यरेषेखालील प्रमाण कमी करणे.
③ साक्षरता प्रमाण वाढविणे
④ स्वच्छ व शाश्वत पाणी पुरविणे
⑤ जैविक व्यास-पुरेसा वाढविणे.

योजना :

(i) राष्ट्रीय कृषी विमा योजना (2002)

(ii) वंदे मातरम् योजना (2004) - गरीबी रेषेच्या तपासणीसाठी अहवाल.

(iii) राष्ट्रीय ग्रामीण रोजगार हमी योजना (2006)

(iv) भारत निर्माण योजना (2005)

11] XIth five Year Plan (1 April 2007 - 31 march 2012)

"सामाजिक सेवा योजन"

* अध्यक्ष - मनमोहन सिंग

+ उद्दिष्टे -

(1) GDP 9%, Agri GDP-4%, poverty less than 10%.

(2) Literacy 85%, Higher education 15%, literacy gender gap 10%.

(3) Targets IMR-28, MMR-1, & TFR 2.1.

(4) Targets sex ratio (0-6) 935, share of pan 33%.

(5) Targets rural broad brand electricity roads awas for poors.

(6) Targets forest cover increase by 5% & standerd clean river.

- सर्वाधिक खर्च सामाजिक सेवा.

WTO : World Trade Organization - Geneva.

GATT : General Agreement on Tariffs & Trade.

UNCTAD : United Nations Conference on Trade & Development - Geneva.

SAARC : South Asian Association for Regional Cooperation - Kathmandu.

SAPTA : South Asian Preferential Trade Aggrement - New Delhi.

SAFTA : South Asian free Trade Agrement - Islamabad.

ASEAN : Association of south East Asian Nations. - Zakarta.

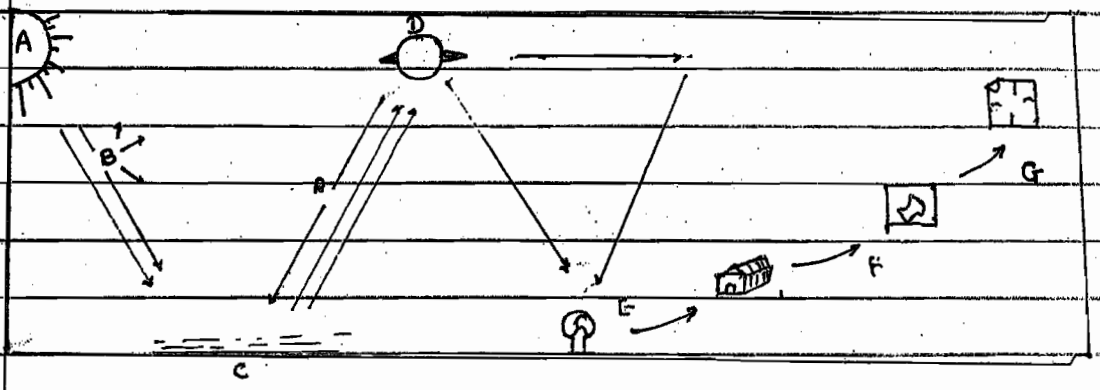
OPEC : Organization of Petroleum Exporting Countries - Vienna.

NAFTA : North American free Trade Area.

UNO : United Nation's organisation - NewYork.

REMOTE SENSING

"Remote sensing means acquiring information about an object or phenomena from a distance, i.e. without actually coming in contact with object."



(i) A : Energy sources - Illuminations.
(ii) B : Radiation of the atmosph.
(iii) C : Interaction with the target.
(iv) D : Recording of energy by the sensors.
(v) E : Transmition, reception & processing.
(vi) F : Interpritation and analysis
(vii) G : Applications.

- **Applications :**

1. Millitary Operations - enemy position & missile guidence.
2. Geologist - minerals, petrol & soil quality.
3. Foresters & Agriculturists -
4. Hydrologists & Oceanographers.
5. Geographer - landuse pattern analies.
6. Civil Engineers - highways, railways, dams etc.
7. Analysis of Disasters - Floods, fire, Hurricanes etc.

Electro Magnetic Radiation (E.M.R.) -

'The sunlight a form of radiant energy crosses the gulf of emptiness betⁿ the sun & earth. This radient energy emitted is called electromagnetic energy'.

- energy is propogeted by EMR with a velocity $3 \times 10^8 m/sec^{-1}$.

- Wavelength (λ) - 'It is the distance between two successive crest and trug is called wavelength'.
- Frequency (H_2) - 'It is measured as the no. of crests passing a fixed point in a given period.'
- Amplitude (wt/m) - 'It is equivalent to the height of peak'. It is measured watts per square meter per micrometer.

- The speed of EMR is constant at 299,893 km/sec.

Velocity = wavelength x frequency

$$c = \lambda v$$

Electro Magnetic Spectrum:

'अवकाशातून, प्रकाशाच्या वेगाने प्रवास करणाऱ्या ऊर्जेच्या, मीटरपासून (m) - नॅनोमिटर (nm) पर्यंतच्या तरंगलांबीचा निरंतरक्रम (continuum) म्हणजे EMR spectrum होय'.

- विद्युत चुंबकीय ऊर्जेचा अतिशय, लघुतम तरंगलांबी असलेल्या गॉमा (Gamma) किरणांपासून दीर्घतरंगलांबीच्या Radio wave पर्यंत पसरलेला क्रमांक.
- wavelength range 10^{-12} m ते 10^{-1} m.

GXUVIMR

No.	Division		Limits
1.	Gamma Rays	-	< 0.03 nm
2.	X-Rays	-	0.03 - 300 nm
3.	Ultraviolet Radiation (UVR)	-	0.30 μm - 0.38 μm.
4.	Visible region - Blue	-	0.38 - 0.50 μm
	Green	-	0.50 - 0.60 μm
	Red	-	0.60 - 0.70 μm
5.	InfraRed Region - Near	-	0.72 - 1.30 μm
	mid	-	1.30 - 3.00 μm
	far	-	3.00 μm - 1 mm
6.	Microwave Radiation	-	1 mm - 30 cm
7.	Radio	-	> 30 cm.

1) Gamma Rays - या प्रकारची अति ऊर्जा वातावरणाच्या अत्यंत पातळ्यांना शोषली जाते त्यामुळे Remote sensing साठी या ऊर्जेचा उपयोग होत नाही.

2) X-Rays - ही ऊर्जादेखील वातावरणात शोषली जाते व दूरसंवेदनाच्यादृष्टीने उपयोगात आणता येत नाही.

3) Ultraviolet Radiation - या विभागातील ऊर्जेचे शोषण अगदी कमी होत असून ही ऊर्जा छायाचित्रणाची फिल्म / Photo Detector यांच्या साहाय्याने चित्रीकरणासाठी वापरता येते.

0.3 - 0.4 μm - Photographic Ultra Violet Band.

4) Visible spectrum -

- डोळ्यांचा हा विभाग दूर संवेदनाक्षमता, हवाई छायाचित्रणाच्या अभिप्राय उपयुक्त मानला जातो.
- 0.5 μm या wavelength डोळ्यांचे सर्वाधिक प्रभावित होते.

5) Infrared Region - (0.7 μm - 1mm)

- या क्षेत्रात पदार्थांच्या ऑप्टिकल गुणधर्मविषयक काहीच माहिती मिळत नाही.
- 0.7 - 0.9 μm Band - Photographic IR.

6) microwave - या तरंगलांबीची ऊर्जा ढग, धुके पाऊस यांना भेदून जाऊ शकते.

7) Radio waves - सर्वाधिक जास्त तरंगलांबीचा प्रदेश, वाहनांच्या महाद्यांने प्रसारित करून प्रतिमा घेतल्या जातात.

- Atmospheric windows : ज्या तरंगलांबी प्रदेशात डोळ्यांचे जास्त संरक्षण होते त्यांना atmospheric windows असे म्हणतात, यांच्याच वापर दूरसंवेदन प्रतिमा मिळविण्यासाठी केला जातो.

- IR colour Photos : 0.4 to 0.7 μm तरंगलांबी ऊर्जा वापरून सामान्य रंगीत छायाचित्रण करता येते.

Interaction of E.M.R. with matter and Atmosphere -

- घन, द्रव किंवा वायुरूप पदार्थांशी जेव्हा विद्युत चुंबकीय लहरींचा संबंध येतो तेव्हा त्याला Incident radiation म्हणले जाते. या पदार्थांशी संबंध आल्यानंतर पुढील प्रक्रियांचे काही शक्यतांचे वर्णन,
- यात प्रक्रियांची Intensity, Direction, wavelength, Polarization & phase या गोष्टींचा समावेश होतो.

1) Scattering -

"It differs from reflection in that the direction deflect associated with scatter is unpredictable".

(i) Rayleigh's scattering -

- Due to molecules & particles many times smaller than wavelength of radiation under the consideration.

e.g - Dust, N_2, O_2 etc.

(ii) Mie scattering -

- There are essentially spherical particles present in the atmosphere with diameter approximately the wavelength of radiation being considerd.

e.g. Pollen, smoke, water droplets. etc.

(iii) Raman scattering -

- It takes place when a photon has a partially elastic collision with a molecules giving up energy to rotation or vibration of the molecules or gaining energy from the molecules.

(iv) Non-selective scattering -

- "There are particles in the atmosphere several times larger the diameter of the radiation being transmitted the scattering process is non-selective".

e.g. clouds, water droplets, dusts etc.

2) **Absorption :**

- Certain wavelengths of radiation are affected far more by absorption than by scatter.

Gases - Ozone, CO_2, water vapour etc.

3) **Transmition :**

- Radiation passes through a substance with out significant attention, from a given thickness or depth of a substance.

e.g. water bodies as capable of transmitting significant.

4) **Reflection :**

- Reflection occurs when a ray of light is re-directed as it strikes a non-transferent surface.

(i) specular - smooth surface relflection as a single direction.

(ii) Diffuse - rough surface reflection in all direction.

Remote Sensors:

- Remote sensors are mechanical devices which collect informations, usually in storable forms, objects or scenes while at some distance form them.

e.g. ordinary camera.

1) Active Sensor -

'An active sensors provides its own source of illumination. while a camera used with flash bulb is active sensor.'

e.g. Radar, Laser altimeter an active sensors.

2) Passive Sensors -

'photographic camera is a passive sensors when used in sunlight'.

- where natural signal levels are extremly low & they are independent of natural illumination for their operation.

(a) Types based on energy source - (i) active
(ii) Passive

(b) Types based on Image - (i) Imaging
(ii) Non-Imaging.

(c) Types based on purpose - (i) commercial
(ii) military.

Remote Sensing Platforms :

'The base, stationary or moving on which remote sensors are mounted is called a remote sensing platform.'

1) Ballons :

'Ballons are rather inexpensive platform & offer a great variety of shapes, sizes & performance characteristics'.

(i) Free Ballons - Depends on wind direction.

(ii) Tethered Ballons - Equipment at a fixed position.

(iii) Powered Ballons - Remotely controlled guided path.

2) Aireraft :

'Aircraft have been playing an indispensable role in the development of remote sensing techniques'.

- Advantages are ; High resolution, large playload carry, Accessibility, repetative survey.

3) Rocket :

- Rocket platforms are for one time observations only.
- It is use for qualitative or reconnaissance, but not of much use in regular operations.

4) Satellite -

- satelite platforms enable large area coverage at frequently intervals in uniform solar illumination condition.

(i) Geostationary / Geosychronous -

-It speed match with the rotation speed of earth, view

(ii) Sunsynchronous - the same portion of the earth surface.

- These satelite moves west to east ; view 1/3 part of globe.

(iii) Sunsynchronous -

- It is incline n north - south orbit.
- It cover each area of the world at a constant time in the day called as 'Local Sun Time'.

TIROS-I - (1960) - 1st Remote sensor satellite.

1. LANDSAT : (U.S.A.) / ERTS
   - unmaned system, EOSAT company private corporation.
   - The first world wide database.
   - Landsat series ; 1, 2, 3, 4, 5, 6.
   - Application for enviormental monitoring, resource exploration, land use analysis, evaluation natural hazards.

2. SPOT : (System Probatoire d Observation de la Terre) - France
   - Belgium & sweeden parhicipation
   - earth observation satellite.
   - Spot series : 1, 2, 3, 4, 5.
   - regional oil exploration, Interprit geological details.

3. IRS (Indian Remote sensing satellite) - India
   - It is a sunsynchronous orbit.
   - IRS series - IRS-1A, B, IRS-1C.
   - LISS (linear Imaging self-scanning system) - I, II, III.
   - Panchromatic system, wide field sensor.

4. RADARSAT : Canada
   - It was developed co-operation with USA.
   - Radarsat is synsychronous.
   - Application ; Ice reconnaissance, coastal surveillance, land cover mapping, snow distribution mapping.

5. NIMBUS - USA TOMS (Total ozone mapping spectometer)

6. METEROS - U.S.S.R.

7. ERS - Proyean Remote sensing satellite. - Europe

* National Remote Sensing Agency (N.R.S.A.) located : Hydrabad.

8. TRIOS : Television & Infrared observation satellite - U.S.A.

9. INSAT : Indian National satellite.

10. TUBSAT : Germany

11. KITSAT : Korean

12. GOES :

13. NOAA : National oceanic & Atmosyheric Adminstrative.

14. GMS : Geosynchronous meterological satellite.

15. IKONOS : USA

16. QUICK BIRD :

IRS :

- Arybhatta, Bhaskara -I, Bhaskara -II, Rohinj
- IRS - Edusat :- Educational purpose
- IRS - Cartosat : Mapping purpose

1) Aryabhatta - India's 1st satalite launch in 1975.
2) Bhaskar I - I[st] Remote sensing satellite - (1979)
3) Rohini - RS-1, RS-D1, RS-D2 : SLV-3 test.
4) INSAT - Agriculture, communication, T.V., Radio, Tribe development.
5) IRS - Crop area, urban settlment, minerals, ocean survey.

Thermal Remote Sensing:

- All matter radiates energy at thermal IR wavelength (3 to 15 μm) both day & night.
- The development were security purpose, geological & terrain features.
- The basic physical processes that control the interaction bet^n thermal energy & matter.

- **Kinetic Heat** - 'It is the energy of particles of matter in a random motion, causes particles to collide, resulting in changes of energy state & emr from the surface of materials.'

- **Blackbody concept** - 'A blackbody is a theroticaI material that absorb all the radient energy that strikes it, which means Absorptivity = 1.'

- **Emissivity** - 'Emissivity is a measure of the ability of a material both to radiate & absorb energy'.

* **Applications:**

(i) Geology - mapping soil type, texture, structure.
(ii) Hydrology - locating irrigation canal leaks, springs.
(iii) Agricultural - crop pattern.
(iv) Forestry - type, forest fire study.
(v) millitary - enimies location.

* **Limitations:**

i. fog & clouds are opague to thermal radiation.
ii. Dust, carbon particles, smoke & water droplets can modify thermal measurment.
iii. It is vary with altitude, time & weather condition.

Microwave Remote Sensing :

- The microwave portion of the spectrum includes wavelengths within the approximate range of (1mm to 1m.)
- microwaves are capable of penetrating the atmosphere see through rain, clouds, snow etc.
- microwaves reflection no relationship earth material in their rough & smooth.

① Active microwave R.S.- To a sensor that supplies its own source of energy. or illuminations.
e.g. Radar.

② Passive microwave R.S - This device responds to the extremely low levels of microwave energy that are naturally emitted & reflacted from terrain feature.

Application's of R.S.:

1. R.S. use in science as well as social science.
2. To gaiting information of landcover, landuse pattern.
3. Mostly used in military purpose.
4. Pridiction weather condition.
5. To the help of resourre managment.
6. To provide in formation of flood, earthquake, cyclone etc.

- In Geography:

  Geomorphology, climatologist, zoogeographer, oceanographer, population study, Agricultural information, etc.

- Limitations -

1. The earth features not clearly showing.
2. R.S. is costly technology.
3. Mostly used in developed countries.
4. sometime depend on weather conditions.
5. It is do not estimate information by earthquake, volcanoes.
6. Variatn betn single photoscale.

PHOTOGRAMMETRY

'Photogrammetry is an arts & science of obtaining reliable measurment of areal photograph'.

• Activities -

1. Determining the scale of photograph.
2. Determining the Relief displacment.
3. Determine the Parallax Measurment.

1) Photographic scale: 'The ratio betn focal length & difference betn flying height (H) & altitude (h).

(i) Relationship betn photodistance (d) & Ground distance (D) -

$$\therefore S = \frac{d}{D}$$

(ii) Relationship betn photodistance & map distance -

$$\therefore S = \frac{PD}{MD} \times \text{scale of map.}$$

(iii) Relationship betn focal length (F) & flying height (H').

$$\therefore S = \frac{F}{H'}$$

2) Relief Displacment :

'Relief displacment refers to shift or displacment of photographic position of an object caused by relief of that object'.

- Relief displacment increase with increasing radial distance also it increas with elevation of object.
- Relief displacment decreases with increasing flying height.

$$\therefore d = \frac{hr}{H}$$ where, h = object height
H = flying height
r = radial distance.

- Object height determination by relief displacment.

$$\therefore h = \frac{dH}{r}$$

'The apparent displacment of an object as seen from two different points that are not on a line with a object'.

3) Parallax -

(i) 'x'-Parallax: 'shift or displacment of photographic position of an object with reference to frame caused by change, the position of observation'.

(ii) 'Parallax refers to the apparent change in relative position of stationary object caused by a change in viewing position'.

- parallax decreses with increasing distance.

(iii) Y- Parallax :- 'If the images are not parallel to flight line is called Y-parallax.'

$\therefore \Delta h = \frac{\Delta P H}{B}$ where, Δh = object height

ΔP = parallax

H = flying height

B = air base.

TYPES of Areal Photographs :

Each type depends upon the altitude of camera with respect to the earth surface:

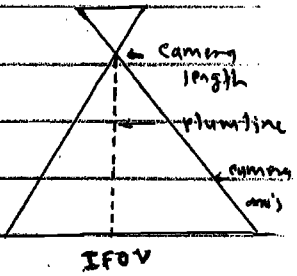
a] On the basis on camera axis -

1) Verticle Areal Photograph :

- A vertical photograph is taken with the camera pointed tollarance is usually '+3°' from perpandiculer to plum' line.

• Charactaristics -

① covers relatively small area.
② Being a view from above unfamiller ground.
③ The shape of ground area 'trepzoid'.
④ The accuracy of maps if taken flat terrain.
⑤ Relif is not readily apperant.



2) Oblique Areal Photograph :

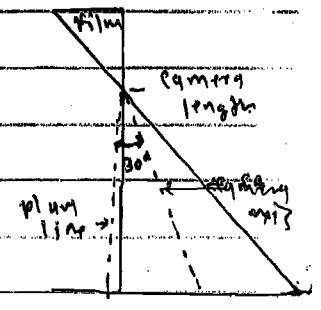
- 'The A·P· taken with camera axis tilted from vertical, perpandicular axis i·e· more than 3° is non as oblique areal photograph'.

① Low Oblique A·P.-

- These is a photograph taken with the camera inclined about 30° from the verticle axis or plum lines
- use : military purpose, supplyiment a map.

• charactaristics

① covers relatively small area.
② Ground area cover trepzoid form.
③ The object have more familler.
④ Relief is distorted.
⑤ It does not show horizon.

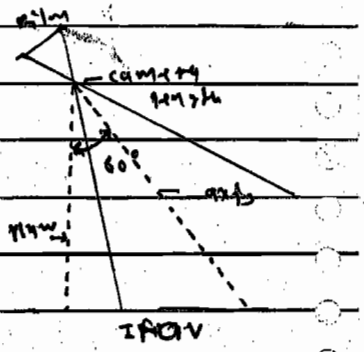


(ii) High Oblique A·P·

- 'It is photograph taken with camera inclined about 60° from verticle axis'.
- use primarly Aernotical charts.

• characteristics:

(i) It covers very larg area,
(ii) The ground cover trepzoid form, But photograph square or reetangular.
(iii) The views are very familler
(iv) Relief may be distorted
(v) The horizone is visible.



b] On the basis of angle of coverage:

'The apper angle at the cone of rays means angle of coverage'.

1) standerd angle photograph - 60°
2) Wide angle photograph - 90°
3) super wide angle photograph - 120°
4) Narrow angle photograph - < 60°

c] On the basis of scale:

1) small scale A·P· - 1:50,000 / 1:5,000,00
2) moderate scale A·P· - 1:10,000 to 50,000 / 1:20,000 - 50,000
3) Large scale A·P· - 1:10,000 / 1:5,000 - 20,000.

d] On the basis of film use in the camera -

1) Black & white A·P —

(i) Panchromatic - 'In this photograph visible band is used But they were represented gray shade'.

(1) monochromatic - In this photograph are one visible band are is used & two band are filltered, and represented gray shade.

(2) Erthochromatic - The two visible band are used & one is filltered and this two band represented gray shade.

2) Coloured A·P :-

- In these photograph three band - Green, Blue, Red are used Green & Red are visible light with false colour composite (FCC) or true colour.

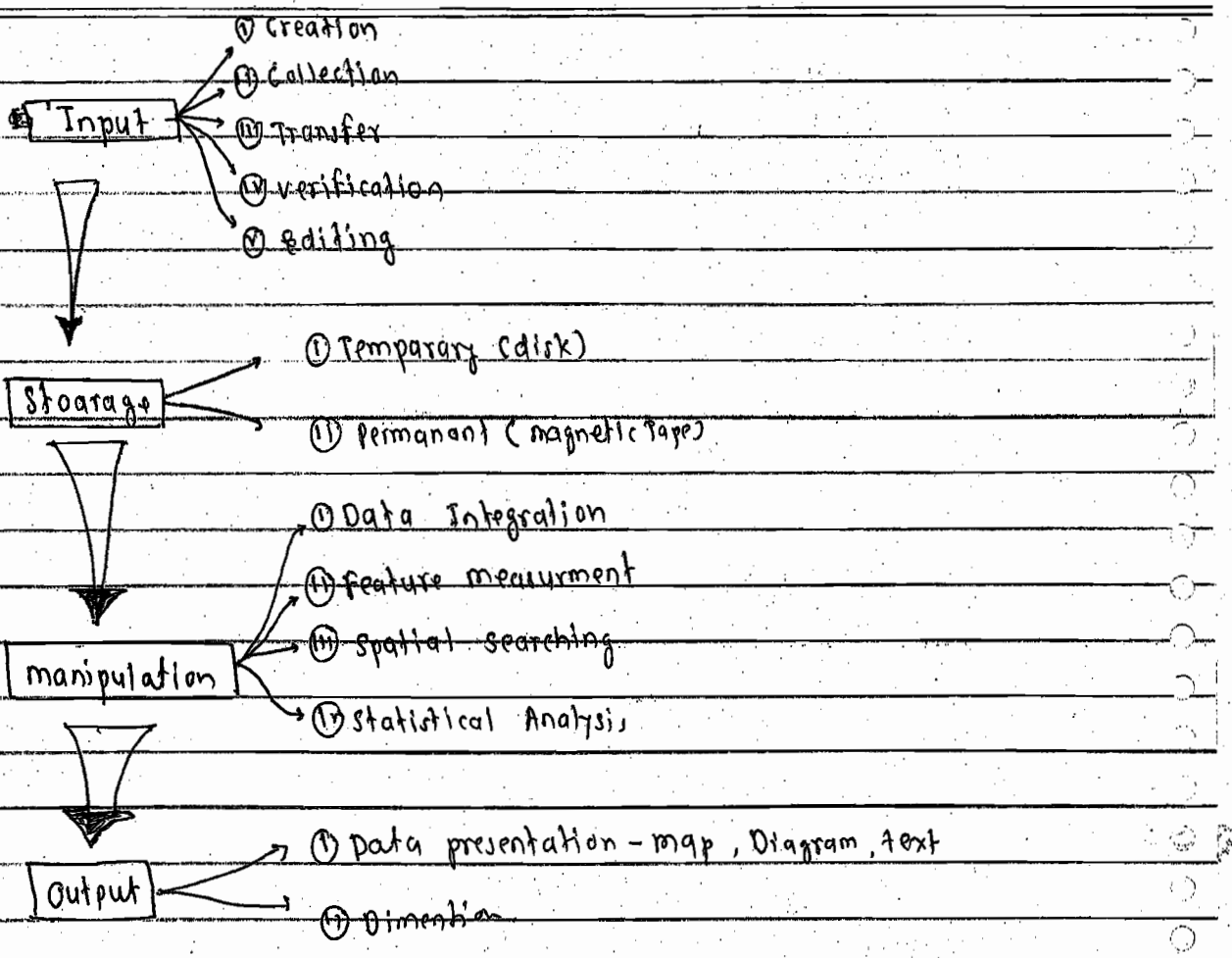
e) On the basis of combination of A·P·-

1) Convergent A·P· -  - two oblique A·P·

2) Trignometric A·P· - - single verticle & two oblique A·P·

3) Strip A·P· -

4) Pentagon A·P·


Input
(i) Creation
(ii) Collection
(iii) Transfer
(iv) verification
(v) Editing
Storage
(i) Temparary (disk)
(ii) Permanant (magnetic Tape)
manipulation
(i) Data Integration
(ii) feature measurment
(iii) Spatial searching
(iv) Statistical Analysis
Output
(i) Data presentation - map, Diagram, Text
(ii) Dimention

- 1st time GIS used in - Canada (1962): To use forest and Rural Development Department.

G.I.S (Geographical Information System)

- Father of GIS - Dr. Roger Tomlison.

'A computer associated system for the data capture, storage, retriving, analysis & display of spatial data within a perticular organization'.

GIS - Great Britain & Geomatics - Canada.

* G.I.S Process :

① **Data collection -**

- The tabular data and analog maps must be converted in to digital format.
- The first steps prepare verious original geographical data sets, which may consits images, maps & statistics data.

② **Geocode source Data -**

- The next step is to geocode the data, which is the resampling each data set to a uniform pixel size i.e. regestered to a geographical co-ordinate system.

③ **Derive Attribute -**

- After geocoding some data sets i.e. suitable for analysis is called attribute.

e.g. Digital elevation map is a raster array.

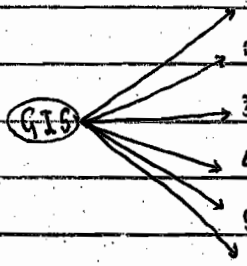
④ **Analyse attribute Data :**

- In this steps selected sets of attribute data are classified using supervised & unsupervised algorithms is also called as 'clustering'.

⑤ **Display Result :**

- The final display of a GIS sesion is typically a map with the desired information show in colour or pattern.

* GIS links to other field :



* Componant of GIS :

1) Computer Hardware :

- keyboard, VDU, mouse, printer, monitor, plotter, scanner, Digitizer, Diskdrive etc.

2) Computer Software :

- software package of GIS consits of 5 technical modules -

(i) Data input & verification.
(ii) Data stoarage & data base managment.
(iii) Data output & presentation.
(iv) Data transformation
(v) Interaction with user.

* GIS input data - maps, Areal photographs, satellite image, field observation, etc.
* Output of GIS - Thematic map, chloropleth map, Dot map, Bar chart, pie chart, Histogram etc.

3) Geographical Data - There are two types :

(i) Non-Spatial Data -

It includes information about the feature i.e. the 'label' given to data.

e.g. Δ mt. Everest (8848m) ⇝ Ganga river.

(ii) spatial Data :

- All the geographical data can be reduced to three basic geographical phenomena.

e.g. (i) Point data - well, (ii) line - River (iii) Area - region.

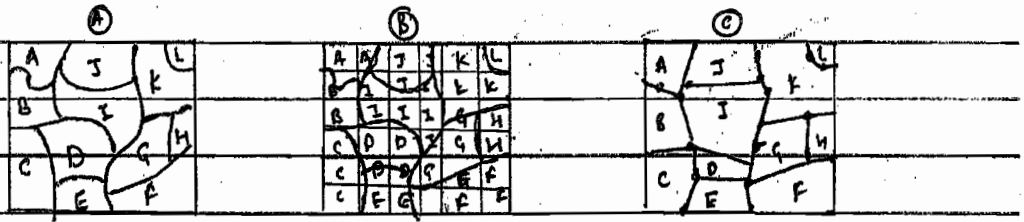
- spatial data divide into two parts -

(a) Raster Data structure -

'set of cells located by co-ordinates each cell is independantly addressed with the value of attributed.

(b) Vector Data structure -

- The three main geographical enitities point, lines & areas.
- Points are similler to cell except they do not cover areas, lines & points are the set of interconnected co-ordinates that can be linked to given attributes.



(b) Database managment :

'The main kind of base structure are commanly recognise term that flat file (spread sheet), Hierarchical, relation & network Data structure'.

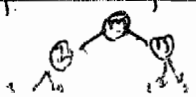
(i) Spread sheet -

- All records in this database have the same number of feeds, individuals of records have the different data.



(ii) Hierarchical -

- when the data a 'parent to child' or 'one to many' relation such as - Hierarchical methods, provide quick & convineon means of data action.

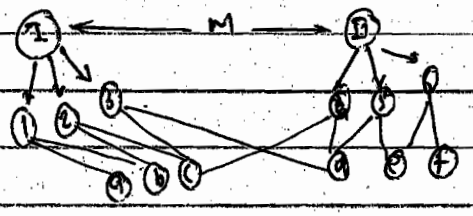


CGIS - Canada geographic Information system.
LCGSA - Laboratory for Computer Graphics & spatial analysis - Hardvard fisher
USGG - United states Geological survey
OS - Ordanance survey of Great Britain.

(iii) Relation:

- In its simplest form stoars no pointers & has no hierarchy, insted data are stocred in simplest record
- Each table or value relation is usually seprate files.

(iv) Network:



Applications of GIS:

(i) Natural resource managment -
- wild Habitats, Recreational resources, flood plains, wetland, agricultural lands, forest.

(ii) Facilities managment -
- Underground pipe & cables, land aquizition, enviormental impact policy, water quality managment, mentanance of ownership.

(iii) Information of street network -
- found particularly in address matching, Locational analysis & side seen, development of plane.

GIS Software :

1. ESRI & mapinfo - Industrial & commerce sector use.
2. GRASS - Goverment & military purpose
3. Google Earth - General purpose.
4. Autocad - Enginering Project
5. Arc GIS - ESRI GIS, small world, x MAP & GRASS - for Cartography
6. GRASS, Quantum GIS, Map server, U Dig - open to all users.
7. DBMS, mysql / Arc SDE - statistical discription & interpritation.
8. Free GIS softwares -
   (i) Open Geospatial Consortium (OGC)
   (ii) Web mapping service (WMS)
   (iii) Web feature service (WFS)

Mercator Projection:

- It is a non-perspective projection.
- The 'Rumb lines' are straight lines.
- Whole world can be represented with minimum distortion.
- It is a orthomorphic & correct shape projection.
- It is most suitable navigational charts.
- It is related to 'Loxodrome'
- It is mainly prepairation navigation.
- 'Equal area' projection

Gnomonic Projection:

- It is also called as 'Great circle Projection'.
- 'Rumblines' are curved lines.
- The amount of distortion increases equally & rapidly in all directions from the centre on map.
- It is most popular 'Air routes'

Zenithal Projection:

- a map projection wherein a portion of the globe is projected upon a plane tangent to it, is zenithal projection.

1. Polar

- On polar zenithal projection the pole show a point.
- The meridians on polar zenithal projections are represented as a straight lines.

2. Stereographic -

- It is enormous growth in importance of polar regions in this age of long range missiels & aircraft operation.

Bonne's Projection:

- The north - south scale is shown correctly everywhere.
- It is a equal area projection.
- It is parallel are concentric curves.
- Only central meridian is a straight line

Mollweide's projection -

- It is best suited construction of world map. 'word Distribution'
- It is homographic projection.
- True direction projection

Settlement Geography

DATE

- Site, Situation, types, size and spacing of settlment.
- Internal morphology of rural and urban settlment.
- Ecological process of urban growth.
- Urban fringe.
- City Region.
- Settlment System.
- Primate city.
- Rank - Size rule.
- Settelment hierarchy.
- Christiller's central place theory.
- August Losch's theory of market centres.

- Conurbation - Petric Geddes
- Break Point Theory - P. Converse 1949
- Gravitation Theory - G.K. Zipf

DATE

Books:

- Human behaviour and the principle of least effort - G.K. Zipf. 1949 (Rank size rule)
- Rural urban fringe - G.S. Wehrwin 1952 proposed by R.J. Pryor. 1968
- Die zentralin orte in sudden chalan - W. christiller. 1933
- Urban fringe - T.L. Smith.

Concepts:

- Conurbation - P. Geddes
- Umland - Van Cleef.
- functional classification of town - Harris
- Hierarchy of settlement - Christaller
- Rank size rule, Gravity model - G.K. Zipf
- Law of Retail Gravitation - W.J. Reilly
- Megalopolis - E.W. Burgess Jean Gottaman
- Concentric Theory - E.W. Burgess 1923
- Sector Theory - Homer Hoyt 1939
- Multiple Nuclei Theory - Harris and Ullman 1945
- central place Theory - Christiller 1933
- Primate City - Mark Jefferson 1939
- City Region - R.E. Dickinson 1947
- Rural - Urban fringe - R.J. Proyer (Proposed)
- C.B. Classmate - R.E. Marghy
- Urbang fringe - T.L. Smith

PAGE

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G.K. Zipf. Progress. 196

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Defination of Settlement :

i) Richthofen -

"Settlment can be defined as natural manner in which man established himself on the earth surface."

ii) Brunhes -

"stettlment is expresion of the grouping and arragment of two fundamental element i.e. House and roads".

iii) Dicken and Pits -

"settlment refers to grouping of people & house in to hamlet, village, town, cities."

iv) "settlment as it is any permanently occupied human dwelling place is called settlment."

- 'm. shaffi' introduced 'urban Geography' firstly in India.
- According to melegin 'study of settlment is also part of population geography.'

DATE

SITE

* Defination:

i) "The absolute location of place or activity described by local relief, landform and other physical charactaristics."

ii) "site refers to the physical enviorment on which the city originated and evolved.".

- The city's geological structure, surface landforms, elevation, water table and other features are included in its site charactristics.
- Factors affecting of city's site location as a Relief, watersupply, land area, climate, Transportation and other social and economic component.

* Type of site centre -

1) Defensive site:

- The important factor in siting early towns and cities was defense. Defence was needed for protection of towns.
- Those towns main function was town trading and defenee.

(i) Hilltop sites-

Hilltop sites provides protection to towns by giving it a commanding position, overlooking any possible enemy.
e.g. Edinburgh is scotland, Fatepur sikri in India.

(ii) Island sites-

Island sites are the sites surrounded by water and easy to defend e.g.- Newyork, singapore, mumbai.

2) Resource site-

- Resources act as the site for the foundation of cities.
- The most obvious examples are those based on mining towns and fishing towns.

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e.g. Kalgoorlie & Coolgardie (gold), Jharia & Raniganj (coal), Kuwait, Dubai (Petroleum) etc.

- The exhausation of the mineral resources the settlment also declines and the town is aboundoned such towns are called 'ghost towns'.

3) Wet point site -

- The settlment owing its site selection to the availablity of water supply, an a drinking, agriculture, industrial & any other.
- Such site near to the water supply such as stream, lake, or spring e.g - London (Tems), Allahabad (Ganga).

4) Dry point site -

- It is elevated site on which a settlment was located in a region, where flooding was likely to take place for where the surrounding areas are waterlogged.

e.g: Settlment on an alluvial fan on glacial valley floor.

5) Other Sites :

(i) Religious & cultural - Jerusalem, Mecca, Haridwar.
(ii) Educational centre - Oxford, Cabridge, Nalanda.
(iii) Seaside resort - Miami, Panaji, Kovalam.
(iv) Sports Town - St. moritz, Sapporo, Banff.
(v) Transport site - Bhusaval, Washington, Solhapur.

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SITUATION

Defination - ① "Situation refers to the relative location of a city with respect to the other places with it interacts"

② "situation also refers to the location of town or village in relation to surrounding".

- It refers to the relation of one settlment to other surrounding condition through varied linkages.
- It covers economic, cultural & political significance of the site of a settlment.

* Types of situation:

a) Linear Situation -

"some of the state, national and international commercial way come to any one center and center ~~of~~ to outword this the situation is called linear situation".

- Town grow up because of their fevourable situation with regard to trding routes.
- They may be at the terminous places where break in journey are made or where changes take place in the mode of transport or they may be at points on a route where other routes criss-cross it.

① Halt & carvan
② Transhipment points or Break'O bulk points.
③ Route converage.

Example: Ajmer, Suvej, Singapour, Kopenhegan, Istambul mumbai & coachin etc.

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b) **Frontier situation:**

"The two different situation boundries are middle point located city or town is called frontier situation".

i) Political boundries of state & country - Indo-Pak.
ii) Mountain and Lowland contact - Saharanpur, Siliguri.
iii) Water and land boundry - mumbai, Sydeney.
iv) Deasert and savanna junction.
v) cold and dry land

c) **Central Situation-**

'Central situation are those that are at the centre of areas with broadly similiar economic activities and product or those at the focus of a large no. of routes which radiate in different direction.'

i) Focal point - Delhi in India.
ii) centrally situated capitals - Delhi, Rome, mascow.
iii) Agricultural centre - Berlin, venipeg, Kolhapur.
iv) Industrial centre - mumbai, oasaka, Manchester.
v) Transportation centre - miraj, nagpur, washington.
vi) Forest centre - Balarlpur, Nepanagar.

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• TYPES OF SETTLMENT :

1) On the basis of occupation -
   i) Rural settlment
   ii) Urban settlment.

2) On the basis of time -
   i) Permanant settlment.
   ii) Temporary settlment.

@ Hameleted Settlment :

'Hamlet means a very small rural populated settlment found in that region popln is very much sparce.'

Example: such as Northern England, Konkan, Ganga-ghagara doab, Kashmir valley (India) etc.

* Charactaristics :
i) Such settlment are transitional zone betn compact and isolated settlment.
ii) The visible centre concrete objects or morphological details i.e. open space, school, temple, community centre etc.
iii) Mostly such settlment found latter occupance or fertile soil.
iv) These settlement tribal racil charactaristics for e.g. Gond in m.p.

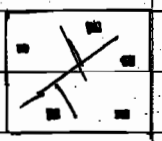
ⓑ Isolated / Dispersed settlment :

- Dispersed settlment are generally found in the areas of extreme climate, hilly treats, thick forest, grassland areas and extensive cultivetion areas.
- Undulating land surface, unfertile soil, are -ve factors and vast fertile land, River flood plane region are ereated by dispersed settlment.

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- The some areas highly productive agricultural land, good climate with dispersed settlment.

Example : (i) Settlement of steppe grassland - Kazakistan, Uzbekistan, Russia & Kirgizstan.



(ii) Settlment of prairies - U.S.A. and canada.

(iii) settlment of Pampas - Argentina.

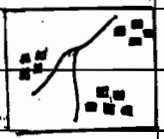
- In arid and semi-arid of Rajstan, NE India, J&K valley, the higher altitude of Himalaya.
- Such settlment may also be seen in 'Khadar'.
- In India dispersed settlment started in medivial period.

© **Compact / Nucleated Settlment** -

'It consists of clustred houses with streets, which are irregular in width and layout. The houses are irregular placed with a respect to the street frontage'.

* factors -

(i) These settlement mostly found in highly productive alluvial places, Degseart apart from agricultural compact.



(ii) Such settlment has common well, a temple, market place & shops, are alway near the centre.

(iii) The need for defence, water supply, fertile soil.

* characteristics :

i) The settlment based on farming and role of water is important.

ii) In these settlment houses are close to each other street are narrow and irregular.

iii) Religious centre & shops are centre of the settlment.

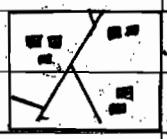
Example : Such settlments are found in northern plain of Punjab in the west to W. Bengal in east.

- Placing of tenements is due to resource availability.

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④ Semi Compact / Semi Nucleated Settlment:

- It is a transitional phase betn the growth of a compact settlment.
- As the new technology adopted, and the popln increase, the scattered settlment taking the shop of semi-compact settlement.



- Semi-compact settlement may also be the result of low easte people segregate by the social taboos (वर्जना) like untouchability.
- The only generalization about semi-compact settlment in the arable land and fertile plain, the primary type of settlment was small & loosely nucleated & locked pattern.

e.g- Such settlement generaly found NW part of the Ganga-Yamuna doab, Khadar plain of the Ganga & it's tributaries.

PATTERN OF RURAL SETTLEMENT

* Defination -

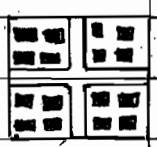
i) "The spatial distribution and organization of settlement is called settlement pattern".

ii) "Pattern or design of rural settlement refers to the spatial arragment of settlment in relation to one another".

* settlment classification on the basis of shape:

1) Rectangular / Square shape:

- mast common type of settlment pattern.



- Rectangular pattern develop in productive aluvial plain and wide intermontane valley.
- The road, rail lines in this pattern are almost straight meeting each other at right angle.

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- The houses are attached to each other and lanes are straight.
- e.g - Such settlments are found in Sutlaj & Ganga plain, Germany, Malasiya, France and Israil.

2) **Linear Pattern:**

- In this pattern house are arranged along a road, railway line, river, canal, foot hill of mountain or sea shore.



- The development of linear pattern in the hilly areas is largely controlled by 'Terrain' & 'Topography'.
- The river banks, sea shore, the flood and water level influence on linear settlment.

e.g. - Such settlement are numerous in the middle Himalaya, Alps, Rockies, The road in the plains of Ganga-Yamuna doab.

3) **Circular / Semi Circular settlment** -

- The fisherman & salt producers establish their settlment along the sea coast and sea lakes.

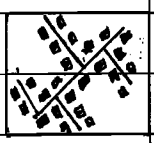


- Such circular & semi-circular shapes on the leaves of ox-bow lakes.
- The people earn their livelyhood from water either by catching fish, water nuts, Grasses or by providing services.

e.g - Such settlement are found in Masai in E. Africa, and people in Israil, lake in (U.S.A), coastal region in India.

4) **Star like Pattern:**

- The stare type settlement develop on the sites & places of where several metalled and unmetalled road converge.



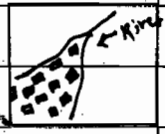
- In this star-shape settlment houses are spread out along road in all direction.
- more common in both village & town settlment, and caused mostly in new development.

e.g - Settlment in satalaj-Yamuna plains, Punjab Plain of Pak. NW Europe plain, & plain of Yangtekiange.

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5) **Triangular Pattern :**

- This type of settlement developes at the confluence (संगम) of rivers and in 'delta' areas.



- The lateral expansion of houses at the confluence is restricted by river.
- e.g : Ganga, Nile, Amezon delta region, Ganga-Yamuna doab.

6) **Nebula Pattern :**

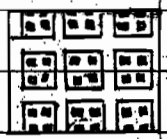
- When the shape of settlment resembles Nebula is known as Nebular pattern of settlment.



- The arragment of roads is almost circular which ends at the central location on nucleus of the settlement.
- These type of settlement develop around the house main landlord of the village or around mosque, temple.

7) **Planned Rural Settlment :**

- In this type roads are wide and regular in shape, and houses are also well placed.

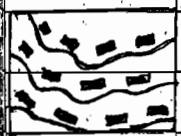


e.g. Australia, S. Africa, Russia, Germany, Sweedan, and Rajstan in India have such planned rural settlement.

- The settlement are good for health because free air & light, land equally distributed,
- The basic services provide such as roads, electricity, water etc.
- The settlment little freedom of action, to slove their processes and inadequate to their family size.

8) **Terraced Settlement Pattern :**

- These settlements are found in hilly & mountainous areas, In the hills & mountains, terraces are cut into the slopes.



- In the terraces cultivateof crops is done with great skill.
- The cultivators construct their huts & houses in their terraced fields.

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Settlement Geography

Internal Morphology of Rural and Urban Settlement

A] Morphology of Urban settlement:

"The term 'urban morphology' refers to the physical arragment or structure of town".

"In breif, it is the study of urban landuse".

* The study of the internal morphological structure of urban region in following point of view:

① Layout -

It refers to general frame on which the city is built. It includes basic structure, building, roads, location of market places and service centre.

② Demographic charactaristics:

The effect of traditionality on the popln charactaristics, popln social status, literacy level, and income.

③ Function -

The two important features of contrary to density gradients and residential crowding.

* Factor and forces affecting morphology of urban settlement.

a) Factors -

1) Physical - ① Relief ⑪ vicinity to revier ⑪ sea coast.

2) Cultural - ① Religious centre. ⑪ market.

b) Forces:

1) Centripetal - ① site attraction ⑪ functional convinenance, ⑪ functional specilization.

2) Centrifugal - ① crowded popln ⑪ pollution in central place. ⑪ verious restriction ⑪ higher taxes percent.

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* Models of Urban landuse / morphology -

Models and theories of urban landuse or structure of two kinds :

i) Partial models -

Which are concerned with the location of one set of activities, such has residential or industrial landuse.

ii) Comprehensive models -

Which deals with all activities in the urban area and their interrelationship.

Theories of Urban Structure

a) The Concentric Zone Theory - (1923) E.W. Burgess

- This theory was proposed by 'E.W. Burgess' a sociologist in 1923.
- Burges main research intrest was the determinants of urban social problem.
- This model basically American in character, because it is made for 'chicago'.
- It also called ecology theory of 'city structure.'

* Assumptions :

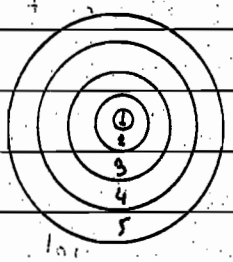
① There is uniform land surface.
② There is a universal accessibility to a single centred only.
③ There is free competition for space.
④ The popⁿ is heterogenous culturally and socially.
⑤ The city areas and population is expanding.
⑥ Easy, rapid and cheap transportation is available in every direction within the city.
⑦ The city centre is the main centre of employment, and near this centre space is limited.

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* **Principles :** (परिकल्पित)

"Burges envisaged that as cities expands, the interaction of people and their various economic, social and political organisation create a radial expansion outward from the centre to form a series of concentric zones or circles".

* **Concentric zones :** June 2012 orderly sequence of C.Z.T.



1. C.B.D.
2. Transitional Landuse.
3. The homes of factory workers.
4. Residential area middle & upper class.
5. commuter zone.

I. C.B.D –

- It is a innermost ring and 'heart of the city'.
- CBD occupies the central place and it is the focus of city commercial.
- The land value and rent of spare are very high in the CBD.
- It contains departmental stores, shops, office buildings, hotels, theater, recreational places and headquarters.

II. Transitional Landuse –

- These zone is described 'Gray zone or Urban light'.
- Some slums also developes in these area.
- These area are occupied lower income group.
- It's territory by converting the older houses of the transitional zone for commercial process.

III. The homes of factory workers –

- This zone homes of factory workers and labourers and these are the people who often moved of the zone II.
- The density and occupancy of this zone is always high.
- They live close to the place of work as they cannot afford high cost of transport.

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IV. Residential area of Upper and Middle class:

- In this zone the majority of the middle and upper middle class pepole reside.

e.g. small buisness man, profesional people, goverment employees etc.

- This are dominating by single families.

V Commuter's zone-

- Beyond the city proper are located a small no. of towns and most of people living in commute to the city.
- most of the people living here work in the CBD.
- The cost of land comparitively low.
- High class residance along lines of rapid travel.

* Criticisms:

1. Burgess suggest C.B.D as a circular shape, generally either square, rectangular, linear, and not necessarily circular in shape.

2. There overemphasis on commerce and trade activity and a complete neglect of the industrial landuse.

3. The effect of major transport has been ignored. People prefer to stay close to the roads.

4. The topographical factors have also been ignored. concentric zones are not possible in the areas of undulating topography.

5. Burgess more importance to residential areas.

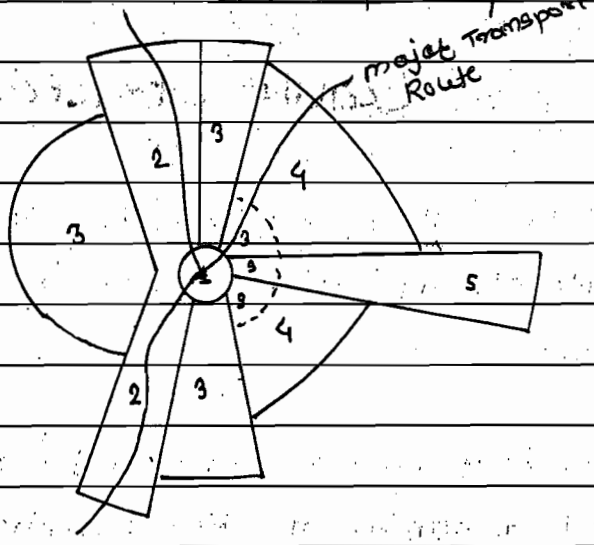
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b) **The Wedge or Sector Model :** (1939)

- Homer Hoyt & M.R. Davis

- The sector model of urban structure was propounded by Homer Hoyt and M.R. Davis in 1939.
- It was based on the study of 64 American cities.

* **Principle** - 'The pattern of urban land use are conditioned by the arragment of routes radiating out from the city centre which create sectoral pattern of land and rental values which in turn influences star shaped city'.



1. C.B.D
2. Wholsale and Light manufacturing.
3. Low-class Residential
4. Medium-class Residential.
5. High-class Residential.

- He found that land rents changed by sector not in the form of successive concentric rings.
- In inside sector older houses and newer houses & construction are made towords the outer fringe.
- A high rent residential district in one sector of the city will migrate outwords by the addition of new belts of housing along its outer arc.
- Similarly industrial sector, factories are declining or changing their function those near outer portion may be expanding.
- The wedge-like sectors developed because of the differances in accessibility from outlying portions to the core region.

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- The sectors developed specially a radial network of communicatn or transport routes diverged from the city centre.

* **Criticism:**

1. It is shape in to such type of sectors i.e. also questionable.
2. He more importance to the transportation routes & communication.
3. Many things all ready explain in concentric zone theory e.g- city expand centre to the outword side.

c) **Multiple Nuclei Theory:** (1945) (Cellular structure)

- Harris & Ullman

June 2012 name

- This theory was propounded by 'Harris & Ullman' in 1945. a less rigid model capable of application to a variety of urban patterns. (Loss Angels)

* **Principle:** 'It was suggested that land use patterns in most large cities develop around a number of discreate centres of nuclei rather than a single centre as described in concentric and sectorial model'.

- The multiple nuclei theory does not produce a simple model of urban structure appropriate to each and every city.
- The term 'nucleus' has been used to refer to any attracting element around which urban growth takes place.

- In fact, the growth of the city, the CBD losses its uniqueness - that it may become just one of the many centres in the city.
- These model is considered more scientific, explain the both present growth of developing & the developed countries.

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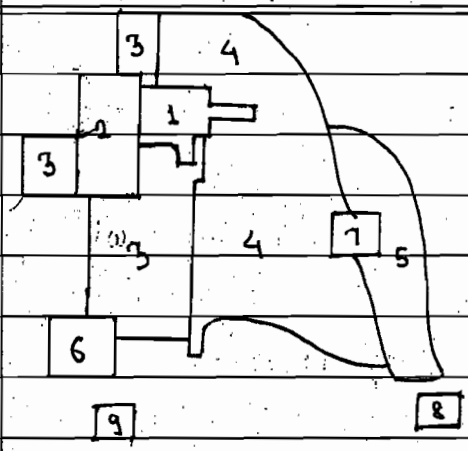


fig- multiple nuclei Theory of urban structure

① C.B.D
② Wholsale & Light manufacturing
③ Low-class Residential
④ Medium class Residential
⑤ High class Residential
⑥ Heavy manufacturing
⑦ Outlying Buisness district. (OBD)
⑧ Residential suburb.
⑨ Industrial suburb.

* Multiple nuclei pattern develop result of following factors:

1) Certain activities highly specilized needs e.g. - retail district.
2) Certain economic functions tend to cluster in the same district e.g- auto repair shop, tyres & auto glass shop.
3) Certain unrelated activities by their very nature repel each other. e.g: school, cinema hall etc.
4) Certain activities generate enough income to pay the high rents. e.g- specialty shops.

- Places that can act as nuclei are airports, industrial complexes, waterfronts, ports, railway stations, university campuses and service centres etc.

* Merit - These theory the advantage of flexibility and applied in both developed and developing region.

* Critics m - ① Excluding big cities this type landuse pattern not found
② It fails to suggest any spatial order.

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B] **Morphology of Rural Settlement:**

- The morphology of rural settlement mainly deals with the layout, plan and internal structure of the settlement.

* **The factors controlling of Rural morphology:** ph

(i) Physical space (ii) Socio-economic space (iii) functional space (iv) socio-culture structure (v) sanitory and economic conditions.

It's mainly divided in to two parts:

1) **Physical factors:**

(i) Site and situation of settlement
(ii) slope of land.
(iii) Availablity of water
(iv) climate
(v) fertility of land.

2) **Cultural factors:**

(i) Transporting facility
(ii) cultural heritage
(iii) Administrative offices
(iv) Occupation of Inhabitants.

* **Forces affecting on Morphology of 'Rural settlement':**

1) **Centripetal force:**

(i) Site attraction - In centre of village have temple, mosque etc.
(ii) functional convinenance - Lower status people live periphery of core.

2) **Centrifugal force -**

'Landless people live in outer limit of village as well as social backword people move outword'.

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* Morphology of settlement has two main componants:
  -1) Ground plan.
  -2) Built-up area.
- The ground plan includes mainly building, street patterns, arragment of landlord buildings & cultural artifacts like temple, mosque, church, choupal, chowk, residence of landlord and shops etc.
- Here, the process of chane comparively slow.
- On the contrary built-up area undergoes frequent changes.

* The main parts of villages consists of the following:

a) Homogenious part - consisting of field, grazing land and community land

b) Circulatory part - consisting of village roads, streets, chak-roads & lines

c) Central part - having built-up area of the village.

d) Special part - marked by temple, school, panchyat ghar, chaupal, morung, place of recreation etc.

* Charactaristics of Rural morphology settlement -

1) Rural houses built mud and local raw material.
2) Rural area's no melted road, Kachy road are construct.
3) Rural areas have extensive land use & horizantal spread of settlment.
4) Rural areas few number of public building such as - school, hospital, panchyat ghar etc.
5) In rural areas the shops are few in number & scattered with space.
6) Building structure are not planned.

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Mumford suggested six stages of growth of cities : EPM²TH

(i) Ecopolis - A big village.

(ii) Polis - A big village when adopts several other functions then agriculture like trade, services etc.

(iii) Metropolis - A bigger town dominant over its surrounding towns. It has very high population. It becomes the centre of economic, cultural and administrative activities.

(iv) Megalopolis - maximum limit of growth, slums come into scene. Capitalism beomes dominant, Morality goes down.

(v) Tyranpolis - In this stage the city goes out of control.

(vi) Nekropolis - Here the city starts down fall, due to any reason, which is beyond human control, such as epidemic, war.

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Ecological Process of Urban Growth

- Throughout human history, cities have played an important role in transforming the society.
- They have been the scence and setting of major social, economic and political change.

* Four phases in the history of cities can be clearly marked -

1. The Early phase, where primary urbanization took place.
2. The Greek and Roman period.
3. The middle period (from 5th century AD)
4. The Industrial Period (from 17th century AD)

1) The Early Phase :

- There were many areas where first urban settlment grew up : Mesopotamia, Nile valley, Indus valley, shan civilizantion of china and maya civilization of mexico.
- The origin of anicent urban centre occured on the bank of river e.g. - Mohenjodaro & Harapa (Indus), mesopotemia (Taigrees & Ufratees) memphis & Thebes (Nile) etc.
- By 3000 B.C there are true urban societies in middle east in which some people were manufacturers, merchant and traders, some officials and some priests.
- The oldest urban settlment there were in the time betn 2800 B.C to 1750 B.C.

2) The Greek and Roman Period :

- The second phase of anicent urban culture was the phase of 'mediterranean culture'.
- The 'city-states' which emerged from the dark ages of Greek, and the cities were often built around acred hills - acropolis.
- Greeks established colonies & trading station in other part of mediteranean world.

e.g - Alexandria, Naples, cyrene, marseilles etc.

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- Roman empire extended economic progress and new administrative system over wider area, like education & culture.
- 'Fort city' concept was more prominent in 'Roman empire' developed.
- Roman developed 'chess board' pattern urban planning and 'walled city' concept also emerged.

e.g. Rome, Turin, Lyons, Paris, Istambul etc.

3) The middle period -

- It is a period of dark age of Europe. ~~age of Europe~~.
- The elimination of dark age brought revival of urban culture in Europe, but before European revival urban culture has flourished in the arabian world.
- After the 11th century great increas trade in Europe and linked by agricalture development.
- Cities are :- London, Paris, Milan, Geneva and venies developed.
- In India historical monuments like Qutab minar, Taj mahal, Red fort, Jama masjid, and Mughal Gardans were constructed during this period.

4) The Industrial Period -

- The greatest phase of urban growth in Europe after occured the industrial revolution 1800 A.D.
- Presently about 1/3 popln of the world is living in urban centre, urban popln growing rapidly.
- 'Kingsley Davis' has called it is the phase of 'popln explosion'.
- Industrial city were the factories and railway yards constituting the buisness and industrial core.
- Cities are - Tokyo, mumbai, shanghai (Asia), mexico, Bumas Aireas, Rio de Janerio (America), Newyork, Los Angels (N. America), Paris, moscow (Europe).

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URBANIZATION

a) **Urban** -

- The word 'urban' generally is used in term of 'demographic character' and 'economic variables'.

"In according to Indian concus: Any area in which continous groups of houses contains popln more than 5000, popln density above 625 per.sq.km., more than 75% person engaged in non-agricultural occupation".

b) **Urbanism** -

Urbanism refers to 'way of life' generally associated to identify the phenomena of city residance.

(i) Bergel - accept urbanism as a condition of circumstances.
(ii) Wirth - treat urbanism as a distinctive charactaristics of urban life.

- Urban man 'think faster and may speak faster', quick sence of humour & modern sence, clear his an ability.

c) **Urbanization** -

* - Urbanize - "The term 'urbanize' means to convert non-urban into urban".

- 'Urbas' lattin words means 'city or town'.

"In the process village or town as a rural agricultural settlement change in to city or mega cities as a urban industrial ~~proce~~ settlment this process is called urbanization".

* Charactaristics -

- i) It is slow and continious process.
- ii) This process fast after industrial revolution.
- iii) This process is economic, industrial & technological development.
- iv) This process change of human life style.
- v) Transfer agriculture in to non agriculture occupation.

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* Causes of Urbanizations -

(i) Agricultural improvment - mechanisation.
(ii) Industrialization -
(iii) Market forces.
(iv) Growth of services.
(v) Improvment in Transport and communication.
(vi) Natural Population increase.

* Problem of Urbanization:

(i) Resource constraints - stress
(ii) Slum and associated problem - crime, robart
(iii) Problem of trash disposal & sewage - diseases
(iv) Transportation problem - Traffic
(v) Enviormental problem - air, water, soil pollution.
(vi) social problem - crime, sucide, mental diseases.
(vii) Administrative problem - service not to regular provide e.g. watersupply.
(ix) Unemployment - sucide

* Solutions:

(i) To control Rural - Urban migration.
(ii) Decentralization of industries.
(iii) Provide facilities - Helth, education, employment.
(iv) manegment & planning of - slum area, traffic, garbage drainage.
(v) Regional Planning
(vi) checking pollution.
(vii) Revamping administrative munciples.

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Urbanization in India:

- In India urbanization flourished as early as 3000 B.C, the centres of 'Mohenjodaro and Harappa'.
- During the medivial periods of Indian history cities developed mainly because of 'socio-economic, geo-political and cultural reason
- After British period 'industrial centre' and 'trading centre' to export and import material.

i) Urbanization before independance -

- British new commerce are constructed many industrial centre are developed.
- British are constructed many administrative centre & commerce centre. e.g- Ambala, Agra, Kashi, shimla, Masuri, mirat, Jalandar, Ahmdabad. etc.
- In 1921 rate of urbanization are slow, but after independance growth of urbanization is high.

ii) Urbanization after independance -

- The growth of urban popln and urban centre in India since after independance.
- From 1951 to 1991; India's urban popln has more than tripled from 62.4 million to 217.2 million.
- urban centres increased from 2843 in (1951) to 3768 in (1991.)
- The proportion of the popln living in urban areas increased from 17.3% (1951) to 27.8% (2001).
- The new developed city Chandigrh, Yamunanagar, Itanagar, Baroni, Noyara etc.

* The most important criterion for classification of Indian urban centre is: Population.

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Rural-Urban Fringe

Firstly used & coined - G.S. Weharwin 1942
Urban fringe coined - T.L. Smith.
propounded - R.J. Pryor (1968)

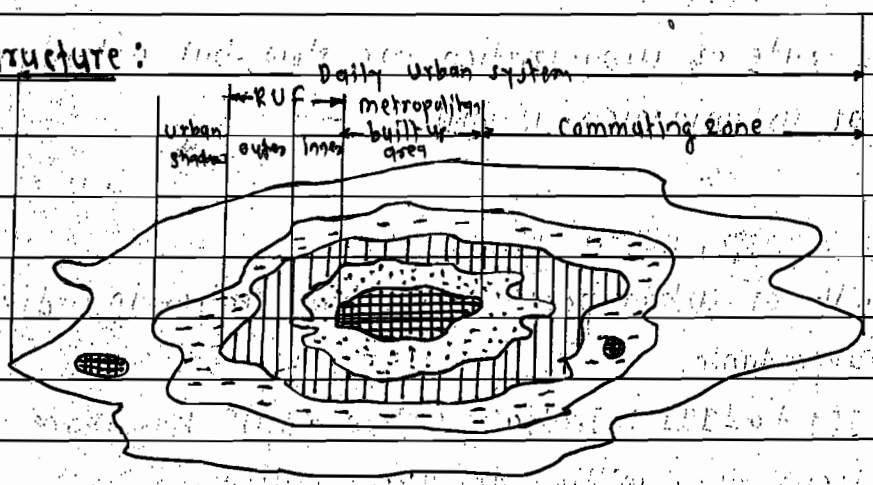
• Defination: ① "The rural urban fring is a zone or frontier of discontinuity bet^n city and country in which rural and urban landuse are intermixed."

area mixed bet^n rural & urban landuse

② "The rural-urban fringe is that area of mixed urban and rural land use bet^n the point where full city service cease to be available and the point where agriculture landuse dominance".

* The 'Rural-urban fringe' word was firstly used by 'G.S. Weharwin' in 1942 in the book of 'Rural-Urban fringe'.
* The term 'urban fringe' coined by - 'T.L. Smith'.
* The concept Rural-Urban fringe propounded by 'R.J. Pryor' in 1968.

* Structure :



1) Urban shadow -
The rural urban fringe lies bet^n to continious buil-up area of city and the 'urban shadow'.

2) Inner fringe -
It is called 'urban fringe' which is characterised by land in an advanced stage of transitional from rural to urban landuse

3) Outer fringe -
also called 'rural fringe', which rural landuse continious dominate e.g. airports, cremations, sewage works etc.

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Rural & Platteau Differences

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* **Characteristics :**

i) The rural-urban fringe is known for the airports, golf course, horse-race course, sewage treatment plants, large size godowns & farm houses.

ii) Agricultural landuse in general is intensive and the arable land is devoted to perishable commodities e.g. vegetables, fruits, flowers, dairy produc

iii) Demographic characteristics - (i) Popln density <400 person / sq. Km.
(ii) <50% people working in non agriculture sector.
(iii) Popln growth rate 40% as compair to last decade.

iv) High land cost, more literacy, constructing building and more urban population in these area.

v) Landuse characteristics - (i) farm size is small (ii) constantly changing pattern of land occupation (iii) residential expansion rapid.

vi) Commuting characteristic - (i) The rural-urban fringe attract middle class residents (ii) fringe areas people commute daily to their place of work in the city.

vii) The planners generally allocated land for schools, colleges, hospitals cremation grounds and cementry.

* **Rural-Urban fringe Problems:**

1) Landuse Problem :
- The garbage and sewage dump of the this region.
- The timber market, air port, drainage and slum region.
- The agricultural land convert in to residance.

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2) Problem of urban services -

stress on facilities

- The services like drinking water, electricity, education, transportation regularly not supply.
- the fringe villages lack most of the civic services e.g. postal, medical, banking etc.

3) Administrative problem -

- The administrative totaly under political, they do not control fringe area.
- fringe areas plan under corruption.

4) Human Problem -

- The different lifestyle of people, low cost of land, services economical and technological problem.
- All the mixed problem in human problem.

* Delimitation of Rural Urban fringe:

* Nangia: has selected the following determinants to delimit this zone:

(i) Density of population - isoline of 100 person per sq. mile (1961).
(ii) Population growth in preceding decade 40%.
(iii) females per thousand males = 800 or less = $\frac{800 \text{ females}}{1000 \text{ males}}$
(iv) proportion of workers in non-agriculture sector = <50%
(v) The outer limits of the 'city bus services' or 'local train services.'
(vi) 'Green belt' surrounded the city and forms a part of rural-urban fringe.

- Besides these major determinants, many other criteria: employed in this study, nearest neighbour distance, functional determinants, and selected routes and linkages.

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* **Rural - Urban fringe in India:**

- During the medivial period, the walled cities in India stood apart from the surrounding rural areas.
- During the British period, a number of villages around existing towns and cities.
- The post-independence period has witnessed a radical transformation of the urban scence.
- The origin of the rural - urban fringe is a rather recent phenomeng around the Indian cities, The growth of industries, commerce, administration and generates jobs for the rural population.
- The city and the surrounding areas comprise two type of administrative areas: ① The municipal towns or nagar panchayats.
  ② revenue villages or gram panchayats.
- The inner towns are sometimes called 'suburbs' it is largely associated with Bombay, culcutta and madarcas.

- Urban fringe is the surrounding areas of large cities which have strong socio-economic link with the city but yet not part of the city.
- Rapid growth of cities lead to urban fringe development.

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CITY REGION

- R.E. Dickinson (1947)

* Defination -

① "The city region is an area around the city over which the city excercises a dominant influence in relation to other neighbouring cities of equal importance."

② "The city region we mean the area that surround a even settlment and is tide to it in term of spatial organisation."

* Concept of city region put forworded by R.E. Dickinson in 1947.
* 'R.L. Singh' for the firstly word used 'Umland' for 'city region'.
* The verious names of city Region:
① Umland - Ardrealike, whittlesey, G. Taylor.
② Urban Hinterland - F.H.W. Green.
③ Urban field - A.E. Smail & E.W. Gillbert.

1) Concept of area of city influence -

Where people commute to the city to obtain certain goods or services. e.g. - collages, hospitals.

2) Area of city dominance -

As a result, a competition generates between two cities to serve the area, But there exists a boundry under which dominance of one city is more than that of other.

3) The concept of city region -

'The city region is the largest of the several areas of dominance around a city'.

R.L. Singh - Varanasi,
Sidhaki - muradabad.

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Delimitation of city Region:

a) Non theoratical /observation/ empirical method (Based on function)
b) Theoratical method (Based on population).

a) Non-Theoratical method:

- In this method priority give to the function of cities.
- This method firstly used by 'R.E. Dickinson (1930).

* Basis of Delimitation of city region boundry:
  - (i) Vegetable providing area.
  - (ii) milk supply area.
  - (iii) food grain providing area.
  - (iv) Bus service area.
  - (v) News paper circulation.
  - (vi) Administrative boundry area.
  - (vii) Education service area
  - (viii) Commuter zone ('Sidhiki' used for 'muradabad').

- 'E.H.W. Green' and 'R.E. Dickinson' used this criteria for delimiting of city Region.
* 'R.L. Singh' used criteria for studing the 'Varanasi' city.

b) Theoratical Method:

or family of spatial interaction model: Wilson's (1974).

1) Gravity Model - - G.K. Zipf

The gravity model was prapopsed by - 'G.K. Zipf' to denote spatial interaction i.e. the movment of people, goods and ideas bet^n places within a transport system for a given period of time'.

- This is an inductive method based on the ideas of Newton's Universal Law of Gravitation'.

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* Main aim -

Zipf's main aim was to predict the amount of movment betⁿ places in a given period of time.

* Basic Principle -

- It is based on Newton's Law of Gravitation -

"Attraction of a region is praportional to the product of their mass (in this case poplⁿ size) and inversely prapotional to the square of distance between them."

where,

$$I = \frac{P_1 P_2}{d^2}$$

I = interaction betⁿ two places.
P_1 = Poplⁿ of huge places
P_2 = Poplⁿ of small places.
d = distance betⁿ two places.

- Hence, the larger the poplⁿ, the greater is the activity and thus the greater in attraction.

2) The Law of Retail Gravitation -

- W. J. Reilly (1931)

- This theory was put forth by 'W. J. Reilly' an American economist as a modification Zipf's ideas.
- This theory Reilly tried to explain the way of measuring the relative attractivness of settlement as commercial centers and mark the boundries of their sphere of influence.

- Reilly assumed a 'breaking point' between two settlements, i.e. the point to which shoppers prefer to travel from one settlment rather than other.

* Basic principles - "Two centre will attract trade from intermidiate places in directly praportional to the population of two centre and inversely praportional to the square of distance". PAGE

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$$\frac{Ra}{Rb} = \left[\frac{Pa}{Pb}\right]\left[\frac{Db}{Da}\right]^2$$

where, Ra Rb = retail trade from intermidiate places two cities a & b.

Pa Pb = Population of cities a & b.

Db Da = Distance of intermidiate place to cities a & b.

3) Braking Point Theory -

- P. converse (1949).

- In 1949, Reilly's law of Retail Gravitation was modified by P. converse to predict the distance of the breaking point, i.e. the intermidiate point betn two cities.

- He explained that betn two cities there is a point of limit up to which one city excercises the dominating retail trade influence and beyond which the other city dominates.

$$dik = \frac{dij}{1+\sqrt{\frac{Pi}{Pj}}}$$

where,

i and j = two cities

K = breaking point betn two cities

dik = distance from j from the breaking point k.

dij = distance betn i and j cities.

City Region in India

- City Region in India can be studied under two hedingns:

① metropolitan regions.

② city regions.

- The delimitation of the metropolitan region of India has been done on the basis of air travel, railway passenger and commodity flows and long distance telephone calls.

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- Indian urban system is dominated by polymetropolitan apex with Delhi, mumbai, chenai, kolkatta.

i) Delhi metropoliten Region:

It cover northern state J&K, Himachal, Punjab, Hariyana, Rajstan, w.up, most part of m.p.
- Delhi region have 12 mega cities.

ii) Mumbai metropolitan Region -

It include Maharashtra, Gujrat, Goa, Western m.p and Daman & Div.
- Mumbai has '8' million cities.

iii) Chenai metropolitan Region -

It include Tamilnady, Kerala, Andhra, Karanataka, s. orissa, & Madhypradesh.
- Chennai has '7' million cities.

iv) Kolkatta metropoliteun Region -

All NE states Aassam, Meghalaya, Nagaland, Tripura, manipur, Arunachal, mizoram, Bihar, orissa, & sikkim. The eastern part of U.P & m.p.
- Kolkatta has 4 million cities.

- The four metropolitan cities account for 80% of the richest people of the country bet^n them.
- The existance of four primary metropoliton cities and regions. Since independance, the emergence of newer & rapidly growing cities such as Jaipur, Ahemedabad, Banglore, Hydrabad, patana, Pune, Nagpur Lucknow.

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- which is the earliest example of true urban development - Tigris and Euphrates valley.
- 'Cellular structure' is example of - Multiple Nuclei method.
- How many circles encircles the CBD proposed in the concentric zone theory - four.
- 'Wedge like expansion' is the example of - sector theory.
- World Highest urbanization country - Australia.
- World population live in urban area - 30% / 31.5%.
- In which stage the condition of city is miserable according to 'Mamford' - Nerropolis.
- The earliest city of the world is considered to be - Memphis and earliest city of new world - Ugrait.
- classifying cities based on minimum requirment techniques was devised by - Ullman and Decay.
- Industralization and rapid urbanisation have created - Urban decay.
- 'Exurbanities' are - The commuters beyond the continious urban builtup area.
- "ecology theory of city structure" - Concentric zone theory.

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SETTLEMENT SYSTEM

* Defination : "Hamlet, village, Town and cities mutually dependent on each other interm of economic, social, cultural and they co-exist as a unified system of settlement in any region, state or nation such system be termed as settlment system".

- A settlment system is formed of different classes of settlement ranked according to their function, These settlement range from number of function to multifunctional region.
- This help to understand the existing interrelationship between settlement.

* Theories of Settlement system:

① **Behavioural Theory** -

The behavioural theory of settlement explain the existing pattern of settlement in a region.
e.g- Zipf's rank size rule, Primate city come under this concept.

② **Normative Settlment** - :

It not concern with existing pattern of settlement but it try to define ideal system of settlement.
- It is concerned with how settlement should be organised rather than how they are organised in the real world.
e.g- Central place theory.

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PRIMATE CITY

- Mark Jefferson (1939)

- The law of primate city was developed by 'mark Jefferson' in 1939. It is based on the observation that the country's leading city is usually disproportionetly larger than other system.
for e.g - 'London' is seven time larger than 'Liverpool'.

- The primate city larger than any other city in the urban system and dominates all other cities not only in population size; but also in its role as political, economic and social centre of country.

- Jefferson noted that the ratio of three larges cities is 100:30:20 and the ratio betn largest city & second largest city is - 2:1.

- The primate city mainly found in small countries:
e.g - Kathmandu (Nepal), Copenhegan (Denmark), Lagos (Nigeria).

Factors affecting Primacy -

1) Size of the country -
The size of country is small the forces of economic centralisation create a tendancy towards primacy
e.g - Denmark (Copenhegon), Suva (Fiji).

2) Colonial History -
- Countries having a recent colonial history and short history of urbanisation show a tendancy for primacy.
e.g - Australia, Newzeland, Srilanka, Maldive, Keniya etc.

3) Export - oriented economy -
A country which is dependent on export of raw material shows the tendancy of primacy. e.g - Newzealand.

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4) Dual Economy -

Countries having partly labour intensive and partly capital intensive also have primate cities.

e.g. - Kenenya, Indonesia, Nairobi, Jakarta, Bangkok etc.

- The dual urban economy has been given 'formal' and 'informal' sector.

5) Simple and Political Economy -

- Countries with small areas and popln, low per capita income and agriculture as the basic economic activity also have a tendancy towords primacy.

e.g. - Kartoum (sudan), Addis Ababa (ethiopia), mexico city (mexico).

* Degree or Level of Primacy -

- There are wide variation in the degree of primacy.
- The degree calculated by index of primacy is the measure of relative importance of the largest town in a nation or a region.

* Its primary is established as -

$$\text{Index of primacy} = \frac{P_1}{P_2}$$

where, P_1 = Popln of the largest town.

P_2 = Popln of the second largest town.

- when the second largest city has less than half the popln of the largest city, then the degree of level of primacy is said to be high and vice versa.

* Primacy rates from 1950 to 2000 :

① Primacy ratio increased from in most developing countries.

e.g. - Colombia, Egypt, Indonesia, Pakistan, are attracting of rural migrant in urban region.

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② In populous developing countries that have a number of large urban agglomerations, the primacy ratio has declined.
e.g- India, mexico and ehina.

③ Primacy ratios since 1950, in most developed countries, have declined or have remained constant.
e.g- France, U.K, U.S.A., and Russia.

④ Where there are two large urban agglomerations and where the natural increases is zero, primacy ratior remains static.
e.g- Canada, Australia and Newzeland.

⑤ Primacy ratio have increased in countries where there is a single dominating primate city.
- Such as Tokyo (Japan), Madrid (spain), Rome (Italy).

* **Multiple Primacy -**

'when a state has more than one primate city it is said to be in state of multiple primacy'.

* **Causes -**

1. Some states has more than one national identity, often coincided with regional concentrations of identifiable ethenic minority groups.
e.g- spain, Italy.

2. The concentration of more than one linguistic groups.
e.g- Canada french & english speakers, India multilingustic.

3. effect of size and distance
Ex - In U.S.A. - Newyork, Boston, Philadelphia, Baltimore.

4. Historical & cultural factors, such as very long period of urbanisation have been responcible for more than one primate city. PAGE
e.g- India (Delhi, mumbai, Chennai, Kolkatta).

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Primate cities in India

- There is no primate city in India, at the national level at present.
- The half of the 20th century, Culkutta was India's leading metropolis, till 1981 culcutta maintained its position followed by Mumbai and Delhi.

- The absence of primate cities in India because- (i) long history (ii) large size of country (iii) colonial heritage and (iv) weakness in the forces of nationalism in the country. (v) considerable degree of diversities in language and culture.

- India have never been a politically unified nation during the 'Mughal Period'.
- Indias cluster a dense population here and there. One single city cannot provide services to entire nation.

* **Primacy at the state level :**

- India is a neither a unitary state, nor full flaged fedral state. it is 'quasi-fedral' state. with a sharing a national union and state power betn them.
- Each state have been cultural and linguistic forms are a politicaly unity have responcible to primate city
- 13 state out of 28 state have primate cities.
  e.g - W. Bengol, Maharashtra, Tamilnadu, Andra and Gujrat etc.

W. Bengol: Culcutta 20 times larger than 'Asansol'.

- Primate city characteristics are absent in the northern states from orissa, Bihar, Rajsthan and Punjab.

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RANK SIZE RULE

- G.K. Zipf (1949)

- The rank size rule was first observed by 'Auerbach' in 1913. but was proposed and popularised by 'G.K. Zipf' in his book - "Human behaviour and the principle of Least effort".

- The cities in any region may be ranked from largest to smallest according to their **population size**:

Thus, the largest city is ranked no.1 the second largest no.2 continuing in this way down to the lower ranking town.

* Theoratical Base and concept:

- **aim**: To find a graphical description to the **size distribution of cities**.

- The relationship betn towns in a precise mathematical terms and states that 'if all the urban ~~area~~ settlement in an area are ranked into decending order of popln of the n^{th} town will be $1/n^{th}$ that of the largest town'.

- The popln of urban settlement in a region can be arranged in the series of 1, 1/2, 1/3, 1/4 .... 1/n.

$$P_n = \frac{P_1}{n}$$

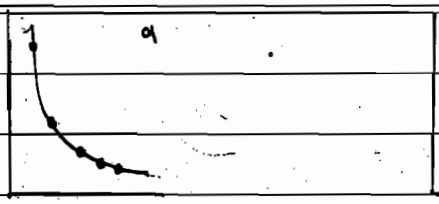
where, P_n = Popln of the n^{th} rank city.

P_1 = Popln of the largest city.

n = rank of the city.

Thus, the second ranking city of a country has 1/2 of the popln of the largest city, the third ranking city 1/3 of the largest and so on down scale.

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- Graphical Depiction of Rank size Rule

(a) normal curve (b) log-normal distribution

- The relationship can be described in graphical form by a plotting a city rank against its population.
- If linear scales for the axes are used to show relationship then a curve result.

If the logarithms of popl^n and rank are plotted on this graph a straight line will be produced.

* Zipf postulates that the size and number of settlements in any nation are governed by two forces:

1) The force of diversification -

Diversification creates a large no. of small places each located near resources, primary activity predominate, land becomes the basic raw material or resources.

2) The forces of Unification -

Unification leads to the popl^n being concentrated in a few large places with the raw material is transported to the people.

- The focus on tertiary economic activities and secondary activities.
- These forces emergence of a few very large city.

Deviation in Rank-size distribution:

1) Primary Deviation -

- It means that the size of the 2nd largest city is less than half the size of the largest city i.e. a condition of primacy emerges.
- These type urban system of a **developing countries**, where it is associated with emerging capitals e.g. Dar-es-salam (Tanzania), Harare (Zimbabwe).

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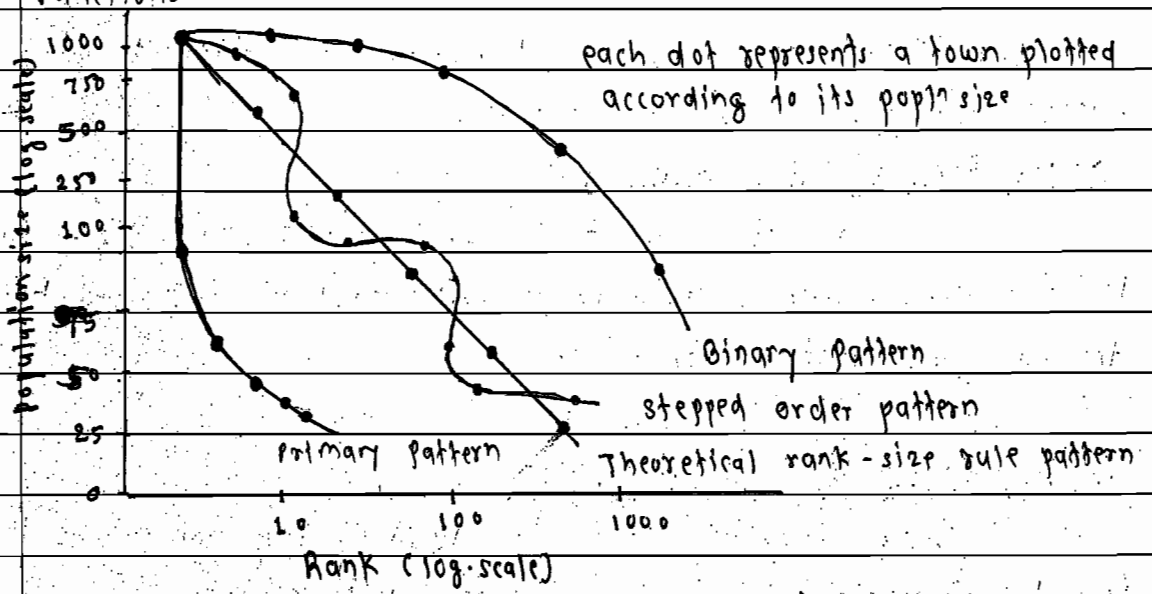
2) **Binary Deviation:**

'It means that ~~that~~ the second largest city is more than half the size of the largest.

- such settlment found in ① Highly industralized country - U.S.A,
② more than one national identity - Spain & Italy,
③ long history of urbanisation - India

3) **Stepped Pattern Deviation-**

The number of settlment found at every level, each place resembling the others in size and functions.



* **Criticism:**

i) The rank size rule of Zipf rather rigid and rarely found in an exact empirical fit.
ii) It is more importance to population size.
iii) The application of rank-size rule is difficult because there is no universal defination of city sizes.
iv) The rank-size rule is more descriptive rather than explanatory or predictive.

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Rank size rule in India

- The rank size relationship is absent in India at the national level as the popln size of Mumbai, Kolkata and Delhi is very close to each other.

e.g - mumbai 16338, Kolkata 13216, Delhi - 12791 million popln.

- The most important implication of the absence of rank size relationship at the national level is that there is no integrated, system of settlement at national level.

- At least 15 out of 28 state primacy exists of India and in another eight states (Bihar, Kerala, M.P, Punjab, Orissa, Goa, Arunachal and Nagaland) the leading city is only just larger than the 2nd city.

- Rank-size rule relationship appear to hold good in the state of Rajsthan., U.P and Haryana.

* In rank size rule the popln of lower Rank city is in proportion is - population of largest city.

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SETTLEMENT HIERARCHY

• Defination - (i) "The categorisation of settlement according to size, status, and the range of facilities provided is called settlement hierarchy."

(ii) "It refers to the ordering of cities and towns in a graded manner. It can be grouped according to size and function."

* Settlment hieranchy based on population:

class no.	Class name	Approximate popl?
I	Hamlet	16-150
II	Village	150-1000
III	Town	1000-2500
IV	small city	2500-25000
V	medium city	25000-100000
VI	Large city	100000-800000
VII	Metropolis	800000 - Indefinate
VIII	Megalopolis	Indefinate but at least several million
IX	Ecumenopolis	Indefinate but tens of million.

- Man-made hierarchies can be of variety of types depending upon socio-economic conditions and the dominant functions. Thus, there can be - (i) administrative hierarchy
(ii) Settlment hierarchy
(iii) Demographic hierarchy etc.

- In urban Geography, hierarchy refers to ordering of state capital, district headqurter, tehsil headqurter & village.

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1) Farmsted Hamlet, village :

(I) social people attach to folk society & social groups place bound.
(II) Popln ranges betn 150 to 3000 in village level.
(III) Economically people ~~engaged~~ engaged in primary activities e.g agriculture, hunting, fishing and small traders.
(IV) Transport facilites are bullockart and Pedestrain.
(V) It is a isolated limited contact.

2) Town, city and city Region :

(I) socialy preindustrial ecological groups, place work-folk isomorphism.
(II) occupations are secondary workers trade & transport, construction, retail and wholsale traders on city region dominant.
(III) Population range betn 2500 to 8 lack.
(IV) city & towns are connected to road, rail and airways.
(V) It is linkage betn Regional links through movment of people goods and services information.

3) Metropolis conurbation -

(I) It is a late industrial class groups, increasing spatial mobility.
(II) It is most occupation of people is Tertiary services.
e.g - Industrialist, entrepreneurs, financers.
(III) The communication support to Television, Computer and satellite.
(IV) It is a popln range '8 lack to indefinate' of each metropolitan city.
(V) The linkinge betn national and international links to each other.

4) Megalopolis hyper-urban :

(I) This social group is 'post-industrial groups' unbound.
(II) Popln of this group Indefinate to tens of millions.
(III) Economic activity in quaternary services high in this region
e.g - Eracativ, Reasearch, scientists.
(IV) Communication support to satellite, skylab, & space shuttle
(V) It is increased international links through space.

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Methods of Determination of Hierarchy:

(A) Settlement Hierarchy based on No. of functions:

- On these basis study has been done by 'Hoffer in 1931' D. Senderson (1932), Bruner & colb (1933), R.F. Dickinson (1934), and A.E. smail (1944).

(i) In India, firstly 'R.L. Singh' made settlement hierarchy of the city-Region of 'Banaras' on the basis of size and function of settlement into city, subcity, captown & small town centre.

(ii) In 1964 'V.L.S. Prakasrao' determined city hierarchy of 'Karanataka' state, for that state he studied 4 function i.e. Hotel, education, Hospital, bank, Theatre, Govt. office, light & water distribution.

(iii) In 1972 Bhattacharya - 'North Bengal.'
6 stages - on the basis of capital, education, Health, Transportation, entertainment, and BATA shops.

(iv) 'S.P. Mukharji' - settlement hierarchy of 'Darjling District'.

(v) 'K.P. Sundharam' - made hierarchy of 'Bastar district' (Chattisgarh)

(B) Settlement based on central function -

(i) 'Chrjstaller' - used Telephone calls for understanding the centrality of cities in south Germany.

(ii) E.W. Green (1948) - service centre of England & wales 5 stages on the basis of 'Bus' services.

(iii) M. Godlund used 'Bus services' for 'sweeden city'

(iv) E.L. Ullman suggested no. of vehicales entres in town for identifying centrality.

(v) 'Reed' - hierarchy on the basis of 'Air transport' - on four stages.

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© Settlement hierarchy based on 'central Indices' -

(i) In 1954 H.E. Bresi used the method for knowing centrality of the city 'somasset of south england'.

(ii) In India 'L.S. Bhatt' (1976) used this method for knowing the centrality of 'kernal' in the state of 'Haryana'.

(D) Settlement Hierarchy based on 'occupation structure' -

- After criticism on telephone method chirstiller used no. of popln engaged in retail trade for determine centrality.

Settlment Hierarchy in India

1) First order Hierarchy -

- The four multi-million cities mumbai, Kolkatta, Delhi and chennai, 'standing of urban potentials'.
- The first order metropolitan cities have popln ranging between 10 million to 18 million.

2) Second order Hierarchy -

- In India take the form of state capitals which are also cities with high primacy.
- It is a concentration of high order administrative, manufacturing, and service activities.
- These centre popln range of '1 million to 10 million.'

3) Third order Hierarchy -

- The 3rd order cities are in betn the state capitals and district headquarters.
- It is popln range of '1 lack to 8 lack.'
- These have developed to provide higher order functional linkages betn sub-regions of the meso-regions.

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4) Fourth order Hierarchy -

- which are district headquarters & important market centres,
- It is really provide the integration beth urban system and the regional resource base.
- The popln range of '25000 to 1,00,000.

5) Fifth order Hierarchy -

- In these order resource centre and service centre, with popln less than 50,000.
- which mainly act as lower order marketing and service centre to the surrounding rural areas.
- It is district headdquarter and Tehsil headquarter.

6) Six* order Hierarchy -

- In these order village and Hamlett surrounded by town.
- The popln range beth '1000 to 2500.
- These mainly act as Grampanchyat as a administrative function.

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- **Ecumenopolis** - C.A. Doxiadis's

"The futuristic city that will the evantully covered the Ecumenene as a continuous system forming a universal settlement".

- It envisages a massive increase in the functional linkages among presently separate urbanised regions and a related increase in the physical continuity of urban settlement as region expand and coalesce.

- **Hinterland :**

'Hinterland means a rural area surrounding the urban catchment of large cities or agglomeration'.

characteristics :

(i) A less dense popln and infrastructure.

(ii) In shipping usage, a port hinterland.

(iii) It services for both import & export.

- **Incompatibility :**

'A situation in which competing land uses repel each other and thus seek location protected from each other is called incompatibility'.

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- The regularity bet^n the sizes of cities and their rank was first noticed by - F. Auerbach. 1913
- How many categories of Indian cities for popl^n size - six.
- which is formula propunded by G.K. Zipf - $P_R = P_1/r$
- who established the relation bet^n cities and their categories was: A.F. Oar bakh.
- The term 'Dynopolis' was coined by - C A Doxiadis.
- The best corporate health care system in the country - Chennai

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CENTRAL PLACE THEORY

- walter christaller (1933)

Introduction -

The central place theory postulated by walter christaller in his book - 'Die zentralen orte in sudden chalan' (central places in southern Germany) in 1933.

- This theory translet in to english by the 'C.W. Buskin' in 1966

"The theory deductively produces a settlement pattern under specified conditions. It explain the number, location, size, spacing and functions of a settlement within an urban system."

* christiller work divided in three parts:

(i) Theoratical part - concern with the setting of theory.

(ii) connecting part - where practicle methods of the theory has been tested in the real world.

(iii) Regional part - where the theory examine for southern Germany.

Assumption :

1) Physical assumption -

(i) There is existance of a flat limitless plain and soil is uniformaly fertile.

(ii) Resources are uniformly distributed.

(iii) There is even distribution of popln & settlement.

(iv) Uniform purchesing power of people.

(v) Demand is spread equally.

(vi) There is uniform transportation network in all direction and all places of the same type are equally accessible.

Aim: The spatial arragment of urban places as service centre, combingnested hierarchies of settlements & market areas.

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2) Behavioural Assumption:

① The maximum no. of demand for goods and services should be satisfied.
② The income of people offering goods and services should be maximize.
③ The distance mode by the consumer to purches this goods and services should be minimum.
④ Number of central placed should be minimum possible.
⑤ There is no interproduct differences.
⑥ Central Place theory is based on Hexagonal network.

Concept of Central Place Theory:

a) Fundamental Concept -

'Those concepts are meaning and applicablity beyond the domain of theory.'

1) Principle of Centrality -

'All the matter in the universe whether organic or inorganic has a core or focal points an a peripheri.

e.g. Sun is located at the centre of solar system. and the neutron at the centre of atom.

- Simillarly the region have core and peripheri, as a village has it's focal point at the temple, church & Bazar etc.

"The smaller settlement are organized around a larger settlement and cities are serve larger settlment."

2) Principle of Hierarchy:

The ordering of phenomena is observed in nature and man-made phenomena also.

e.g. Sun - planet - moon are three tier hierarchy PAGE
solar system. such as hamelt - village - town.

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b) **Derivative Concepts :**

A central place is a settlement with serve as focal point for a number of other settlement, which are depend on it. To be the centrle place a settlement must offer some ~~some~~ service of a very regular nature with daily perodicity to the settlement around.

1) Central Place -

A central place is a settlement which serves as a focal point for a number of other settlement which are dependent on it.

2) Complementary Area -

'The complementry area is an adjunct to the concept of central places. In a theoretical sense, it would be a larger for bigger and more important central place.'

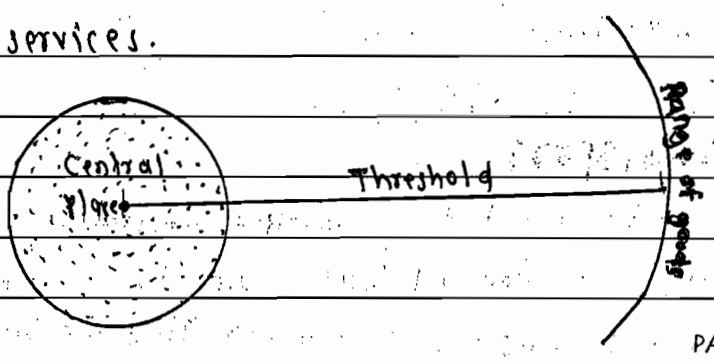
3) Threshold Population :

'It is the **minimum no. of popln needed** to be supported by any goods and services'.

e.g - Glossary shop need small popln where a car shop need large population.

4) Range of Goods :

'It is the **maximum distance** that a consumer is prepaired to travel a certain distance and obtained a certain goods and services.



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Principles :

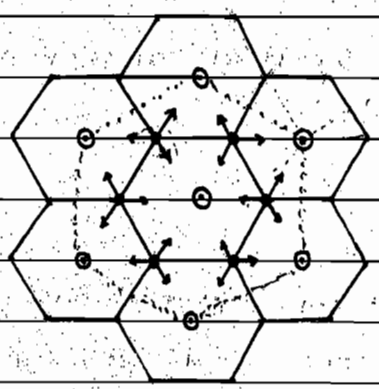
1) 'K3' - Marketing Principle :-

- Under the marketing principle, settlement of every order would be surrounded by six other settlment of next order.
- The low order centres thus lie on the boundries of the market areas of middle order centres.
- In the simplified case may choose betⁿ three higher order centres, since all three are equidistant.
- Each higher order centre than recive 1/3 of the customers of the six immidigetly lower order centres, which are located on the boundry of its market area.

- If can thus be considered to serve a poplⁿ equivalent to two lower order centre - $6 \times 1/3 = 2$.
  Besides, it also serve it own population = 1.
- Therefore it serves a total of three central places

$$6 \times 1/3 = 2 + 1 = 3$$

shopers in the smaller places divided in to 3 equal groups when shopping in the 3 nearest larger places.



Equi. no. of central places - 1, 2, 6, 18, 54 & so.
Equi. no. of market areas - 1, 3, 9, 27, 81 & so.

• - Lower order
⊙ - Higher order.

K3 = Principle

2) 'K4' ~~Marketing~~ Transport Principle :-

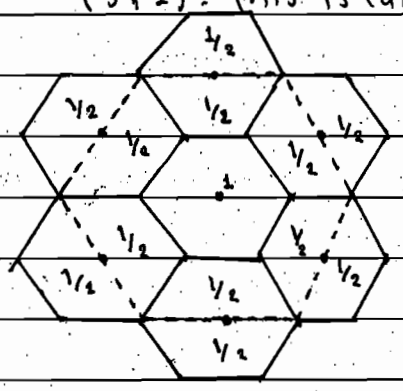
- The pattern created by market optimising principles is responsive to demand but leads to an inefficient transportation network. Because routes which link the higher order centres do not pass through the lower order centres.

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- central places are so located that lower order centres lie along the straight line paths betn higher order centre.
- Thus each higher order centre recive 1/2 popln of six immidgetly lower order centre.

Besides that is also serve it own popln 1. making four in all (3+1). This is called a K=4 network.



K4 = Principle

Shoppers in the smaller places divided into 2 equal group when shopping in the 2 nearest larger places.

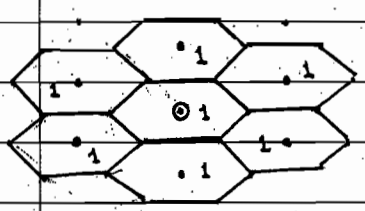
$6 \times \frac{1}{2} = 3 + 1 = 4$

* Equi. no. of central places 1, 3, 12, 48, 192 & so on.
* Equi. no. of market places 1, 4, 16, 64, 256 & so on.

3) 'K7' Administrative Principle:

- In rural areas small towns develop mainly provide administrative facilitie
- In administrative principle, the market area of each of the higher order centres includes the entire market area of each of the six neighbouring lower order centres.
- This happen because where administrative is the dominating principle & question of the legal jurisdiction are important.
- The administrative centers has higher degree of functions than market and transportation. Because there are only few places which has administrative functions.
- In this way each higher order centre recive entire popln of 'six' immidgetly lower order centre, Beside its own popln one. so the total popln served by 'seven' lower order centre.

$1 \times 6 = 6 + 1 = 7$



All shoppers in the smaller places shop in the nearest large places

- Equivalent no of central places - 1, 6, 42, 294 & so on.
- Equivalent no of market places - 1, 7, 49, 343 & so on.

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* **Criticism :**

i) A isotropic surface is ideal, rarely found in the real world.

ii) The behaviour of consumer and sellers not always rational.

iii) The hexagonal pattern of central places is rarely found in real life.

iv) The fixed value 'K' poor approximation with reality.

v) The model does not take into consideration the location of industries which invariably modify the centrality of settlements and threshold goods.

* **Contribution in Regional Geography -**

① It guide planner in identification the existing hinterland of localized or mobile service.

② Find out which area & people are out of reason of individual services.

③ Find out which centre are stronger interm of available service.

④ It help the planner for recognize central place.

* **Present Day Applicability and Use -**

1) It provides a rationale for selective location and efficient division of space and function.

2) It show interdependance of country and town in terms of functional & behavioural dimention.

3) It encourages us to think of individual settlements in their wider context.

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4) It show inter-relatedness of settlments, and its distribution.

5) The CPT seeks to analyse the function and hierarchical orderliness in the settlement landscape.

6) The CPT help us to identify more clearly the role of settlements as places of trade exchange

7) The CPT has been used as a guidline for relocation policy and integral part of regional planning.

8) It helps to identify some of the important principles & concepts inherant in settlement functioning as central places, such as- threshold popln, range of a good, centrality, etc.

Central place system in India:

- India has a six-level hierarchy of settlements from the point of view of administration.
  Thus, we have national capital, state capital, district headquarter, tehsil town and finally block development centres and gram-panchayat centres.
- The administrative hierarchy of settlment in India, ratio of district to states is almost 1:19. (christller 1:7).
- The number of tehsil per district is slighlty over 'six'.
- In marketing principle the ratio of higher order centres to the immediate lower order centre is - 1:1.72, (actual ratio 1.41 - 1.83).

"On the basis of above discussion, it cannot be conclusively proved that central place systems apply to Indian condition. On the other hand cannot be rejected completly as well."

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A. Losch theory of market centre :

- The first attempt to develop a general theory of location with the major emphasis on demand was made by 'A. Losch in 1940'.
It was translated in to english 1954.

* Aim - 'This sought to explain the size and shape of market areas within which a location would commond the largest revenue'.

* Assumptions :
① The world to a flat uniform plain / isotrofic surface.
② Constants supply of goods and services.
③ People live in isolated evenly spaced farmsted.
* ④ Demand decreases with an increase in price.

1)

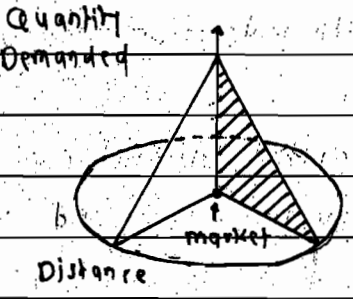
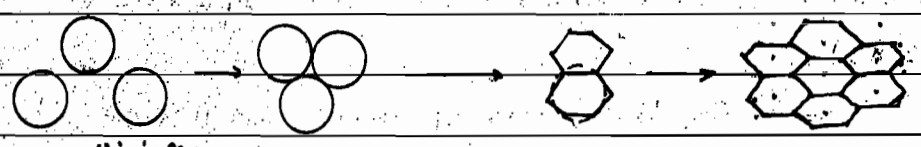


fig - Derivation of Demand cone

- 'If this price increase was the result of an increase in transport costs, the demand would decrease with distance from production centre.'

- Demand decreases as a price increases. Assuming that the price increas is the result of transport costs, by rotating the demand curve around the production point, the shape of the market area is seen to be circular.

2)



criticism

market become hexagonal to avoid exclusion of fringe area.

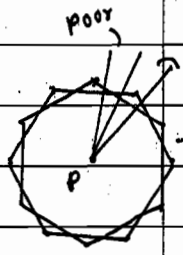
- The competition increase as other produrers develop in the plain the market areas become hexagonal to avoid overlap and the exclusion of same areas.

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- Each product will have a different threshold and size of market area (k-values) depending on the relative importance costs in its price.
- In all there were 150 different k values (k=9, 12, 13, 19, 21 etc) each representing different sized of market area, including manufacturing and industries.

- The spatial structure that would be efficient for both the producer and consumer, which could be the centre for each of the 150 different hexagonal market areas, could do this.



- He the arranged one production centre common to all 150 different market areas metropolis being the highest order centre of them all.
- Since, it is a central places for all 150 network it will sell all 150 goods, and superimposed 150 hexagonal market areas.

- The nets are arranged in such a manner that alternating sectors of 30° angular size radiate out from the metropolis.
- There are such sector arranged alternatively:
  - (I) Six sector have many economic activities - 'city rich sector'
  - (II) Six sector relatively few - 'city poor'.



■ - rich sector
□ - poor sector

- There are more higher order centre's in the activity rich sector than in activity poor sector.

Between the rich and poor sectors are aligned the major transport routes.

* **Criticism:**

1) It overlap emphasizing the demand.
2) This model present a very complicated picture of the services and manufacturing thresholds.
3) The overlapping of networks creates the problems of cartographic representation and often difficult to understand.
4) It ignore problem of locational interdepends of factories & plants.

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Christaller And Losch - A Comparison:

- A. Losch presented and important modification of christller basic model.
- He helped bridge the gap betn the simple step models of christller's system and as a special case to be real world.
- Losch development of christller theory allows for:
  - i) more variation in threshold sizes.
  - ii) several K values in the central place system.
  - iii) A greater veritey of central places.
  - iv) Towns having different sphere of influence for different goods and services.

	Christller model	Losch model
i)	It is based on the study of 'Boveria' provinance of S. Germany	- Losch sampling is from all over Germany.
ii)	His concept based on the consumer & seller's behaviour, transport & administrative services.	- He consider 150 commodities & services and developed over 40 network.
iii)	christller began his hierarchy from highest centres such as metropolis.	- Losch did reverse lowest level of hierarchy.
iv)	His theory better understanding of retail buisness & services.	- Loschian economic landscape of market based manufacturing.
v)	His pattern best suited for those cities which developed in sparse settlement region.	- Losch's theory better suited for densly populated region.
vi)	He proposed few K values.	He was praposed many 'K' values.

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- 'Both the models stress on the distance minimizing pattern of consumer shopping choice.
Both the models have been of great importance ~~of~~ in the regional planning both developed and the developing countries'.

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- **Demand Cone:**

"The spatial representation of the relationship betⁿ Demand for a good and distance from a market or production point."

- The greater the distance from the marked or production point of the higher is the price & consequently the smallest quantity demand.
- Thus, each market surrounded by demand cone.

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- 'Sneile' town is the - Relict stage.
- 'Ghost Towns' are - Deserted towns.
- Cities were divided on functional basis for the first time - Arsenev.
- 'Sjoberg's Model' related to - Form and structure of urbanization before the modern era.
- 'Alonso Model' is - A model to explain the pattern of landuse and land value in urban area.
- Christller concept of centrality is based on - Range of goods.
- 'Nested Hierarchy theory' was given by - A K Philbrick.
- Centrality of an urban centre is measured as - The ratio bet^n the services provided and the local needs of its inhabitants.

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* C.B.D. (Central Buisness District) -

— R.E. Marphi & Vance

- This concept is first explained by 'R.E. marphi'. he is a American geographer.
- C.B.D is a American concept is known as 'Down Town' in Newyork, Pittsberg 'Goldentemple', It also called 'loop-chicago'.

"It is an centre of the city, hub of its buisness and civic life, distinct physical and Human feature"

* Charactaristics :

1) High accessibility - (i) roads, railway lines & airports are connected.
(ii) All govt. offices city centre daily communication of human.
(iii) Customrs usable product in centre e.g. milk, vegetables, hotels etc.

2) Three dimentional quality - (i) less amount area available. / lack of space
(ii) Total use of space and vertical tallest building at the centre.
(iii) C.B.D to outwards land prices also dicresses. centre to outword

3) Absences of Residential Popl^n -
(i) High land value & residential houses are not available
(ii) During day time high popln and night time absence of popln.
11 a.m. to 9 p.m.

4) manufacturing in the C.B.D -
- The absence of residential popln that the same type absence of manufacturing, only footloose industries on given region e.g - Printing press

5) Internal specilization -
- The same type of shoars & market are sailing same product of few shoars e.g - shoe line, jwellery shop, etc.

6) Assests : (i) one half of employment available city centre. ½ employment
(ii) To protect & dvelovment historical & cultural value of city.
(iii) Cities economic centre.

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- The 'zone of assimilation' & 'zone of discard' is used in the concept of C.B.D.

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* **Delimitation of the CBD:**

1. Obtain a large scale map of the city centre.

2. By fieldwork - writing to visiting buisness,
   (i) total floar area of each building.
   (ii) total floor area devoted to CBD activities, i.e. retailing, entertainment, finance, buisness administration.

3. Derive the Height Index i.e.
   $$\frac{\text{the area devoted to CBD function}}{\text{ground floar area}}$$

4. Deduce the Intencity Ratio i.e.
   $$\frac{\text{area devoted to CBD functions}}{\text{total floor area}} \times 100$$

* **Problem of C.B.D OR Changing Importance of C.B.D -**

1) It is inability to adjust new needs.
2) The building of 'down town' date back a half century.
3) High land value and lack of space.
4) Transportation problem related traffic and parking.
5) High level of noise and air pollution, make CBD condition less pleasant.
6) The development of telecommunication technology.
7) The extreme governmental fragmentation in our metropolises.

* In the Hewling model in urban popln density distribution the term 'Density Crater' is applied to 'Central Buisness District'.

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• **Megalopolis :**

- Jean Gottoman (1964)

- Megalopolis term was first adopted by 'Jean Gottoman' in 1964.
- megalopolis 'Greek word' means :- mega - Big, polis - city.
  'A continiously belt of urban population progressively linking several cities is known as megalopolis'.
- The term is used for the merger of several million cities.
- Example : Boston to washington (Bowash) in U.S.A. and Los Angels and San Diego (U.S.A), axial belt (Britain), Rohane valley betn Lyan and marseilles (France).

* **Classification of cities / on the basis of population.**

Towns -

I - more than 1 lakh.
II - 60,000 - 99,999 -
III - 20,000 - 49,999 -
IV 10,000 - 19,999 -
V 5,000 - 9,999 -
VI below than 5,000 -

ⓐ **Classification based on Age :**

I. J.M. Houston's - In his book "A social Geography of europe".

1) The Nuclear stage - The early stages of development has a central and confined within wall.

2) The formative stage - These cities developed follwing the Industrial Revolution, changing transport & trade.

3) The modern stage -

In these stage cities rapid growth taken place, cities well established, suburb, major transport developed.

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D. G. Taylor scheme-

1) Infantile stage-

The cities are initial stage of development, demarcation of domestic & commercial areas or poor & rich areas.

2) Juvenile stage-

This stage city growth, shop start springing and concentration of commercial activity of centre.

3) Maturity stage-

In this stage residential zones are established, Commercial & Industrial areas are well established.

4) Senility stage-

After the well-developed stage of maturity, the growth stops as the senility stage and decline in economic prosperity.

(b) classification based on Growth of Civilisation-

'Lewis Mumford' under the influence of 'Patrick Geddes' visualised town

* He suggested a two-fold classification-

(1) On the basis of social changes & technical progress:

i) Ecotechnic - This phase use of immobile power sources like wood, wind & water, primitive technology and underdeveloped transport.

ii) Palaeotechnic - This phase use of coal as power and the development of the steel & iorn industry.

iii) Neotechnic - This phase technological innovations in industry, agriculture, energy resources & transportation.

① Eopolis - Beginning of urban settlement.
② Polis - Town formation
③ metropolis - Bigger town
④ megalopolis - Urban maturity
⑤ Tyrannopolis - out of control
⑥ Necropolis - city down fall

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iv) Biotechnic -

This is the most developed phase - applied to sanitation, medicine and his knowledge.

② On the basis of cultural rise and fall of a city -

Mumford consider a town rising three stages and then sinking through another three stages :

i) Eopolis -

The earliest stage of a city evolution, and economy was dominated by agriculture, mining & fishing. e.g - A Big village.

ii) Polis -

This stage small market developed, some manufactures depend upon the town. They adopt agriculture like trade, services etc.

iii) Metropolis -

This term applied very large city, population is engaged in many specilized occupations. Bigger town dominant over surrounding.

iv) Megalopolis - maximum limit of growth, slums come in to space.

The term refers to a highly urbanised & bloated city.

v) Tyrannopolis -

The megalopolis psychology continues in this stage. wealth, demonstration & extravagance. The city goes out of control.

vi) Necropolis - "City of the Dead". - W. Bunge's.

This city due to war, famine or disease, living conditions deteriorate badly. Municiple services decline, cultural institution decay.

③ Functional classification of Towns / Cities

1) Auroussegu - Dominant function.

- Six urban function administration, defence, culture, production, communication and recreation.

Nelson ~~Aurousseau~~ - statistical criterion

~~Aurousseau~~ multiplicity & specialisation of activities.

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2) Chauncy Harris - multiplicity & specialisation of activities.
- classification based on employment and occupation.

3) Kneedler-
- classification based on 'census data'.

4) G. Alexanderson-
- classification based on 'industry group data popln census.

5) Duncan and Reiss-
- classification on categories like wholesale trade centre, retail trade centre and non-trade centre etc.

6) Nelson - statistical criteria.
- classification based on 'major industry group'.

7) Maxwell-
- classification based on 'city employment structure'.

8) Ullman & Decay - minimum requirment method!

9) Moser and Scott-
- The latest city classification uses multivirate analysis.

10) Richard Forstall -
This was scheme based on the social and economic characteristics of the city.

(I) Mining & Quaring	(IV) Administrative
(II) Industrial	(V) Defence
(III) Transport	(VI) Cultural
(IV) Commercial	(VII) Health & Recreational.

11) Ma~~klassie~~ - ecological consideration.

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- **Green Belt:**

- The green belt is part of Rural-urban fringe and it's aim to control the physical expansion of ~~coun~~ large cities.
- A green belt 2 to 5 km width encircle the entire city.
- It has picnic spot, park and other recreational area.
- In India since 1960 have included the green belt in their physical landuse plans.

- **Satellite Town -**

'A town designed to house the overspill popl^n of a major city, but located well beyond the limit of that city and operating as a discreate, self contained enitity.

e.g - faridabad, Noida, Gurgaon are the satellite towns of Delhi.

- **Urban Areas:**

1981 Cencus defined as;

(a) any place of municiplicity, corporation or notificited town area.

(b) which satistied all the following criteria -

(i) a minimum popln of 5000.

(ii) at least 75% male popl^n working in non-agricultural activities.

(iii) popl^n density of at least 400 persons / sq.km.

- **Conurbation:**

- The term 'conurbation' was coined by "Patrick Geddes".

'A built-up area created by the coalescence of once seprate urban settlements, initially through ribbon-development along the main inter urban routes.

e.g. eastern part of U.S.A. Boston to Atlanta.

In India Kalka to Agra.

- 'Continuosly built up area formed by coalescence of seural urban settlment'

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- **Rural-Urban Continuum-**

-The concept was developed by 'R.E. Pahl' in 1966.

'It suggest a continious gradation of ways of life bet^n the two poles of truly rural community and truly urban society.'

-The concept also understood way of life and it has been distinguish bet^n urban & rural extremes and as a theory of social change which emphasized the transformation from one pole to another.

- **Urban Sprawl :**

'It refers to the expantion of large urban areas beyond its limits'.

-The expense of surrounding agricultural land and the fringe areas are continuously being shifted outwords. The town crowded dwellers moving from city centred to sub urban & build larger houses.

- **Slums :**

'An area of poor housing, multioccupancy and overcrowding, poor school & sanitation facilities, and surrounding generally polluted. Slum area often exhibits high concentration of drug abuses, alcholics, criminals and vandals'.

-In India different names of slums in different cities.

Bastees (kolkata), Cheri (Chenai), Jhuggi (Delhi), Jhopadpatti (mumbai)
Barracas (Venezuela), favela (Brazil), Kampongs (SE Asia)

- **Squatter Settlements / Shanty Colonies-**

'An urban area development, usually predominantly residential, on land neither owned nor rented its occupants, is known as a squatter settlement'.

-Such settlments are mainly found in Third world countries.

DATE

- **Ghetto:**

'An urban region marked by particular ethnic, racial, religious and economic properties, usually a low-income area'.

- Ghetto, a part of city, not necessarily a slum area, occupied by a minority groups.
- The term first used by 'Jews' in Europe & spread especially black minorities in U.S.A.

- **Ghost Town:**

'A term used to describe a once flourishing settlement, now completely abounded or inhabited by few people.'

e.g. mining settlement (gold) in Aus, S. Africa.

'A settlement whose name appears early in the record books but which is no longer inhabited.

- **Agglomeration** –

'The clustering or grouping together of people and services to their joint benifit'. The attractivness of these urban centres increases, producing still further agglomeration.

e.g. The largest urban agglomeration in china is shanghai.

- **Cosmopolitan:**

Literally 'a citizen of the world' one free from local and national prejudice. In geography, the word tends to be used adjectively to denote an ethinically and culturally mixed population.

- **Dormitory Settlement:**

'Rural settlements from which the resident Active Population commute to employment elsewhere.

- Such settlements are the result of the growth and redistribution of large urban/ metropolitan centres.

DATE

- **Centrification:**

A process whereby the social character of a neighbourhood is changed by the infiltration of professional & higher income groups seeking central city locations.

- **Heat Island -**

'The phenomenon whereby temprature within a city or large town are often significantly higher than those of surrounding rural areas.'

- The heat island effect is greatest at night temp. 6-8°c higher.

* factors: (i) release heat by domestic & industrial fuel consumption
(ii) the high capacity of heat absorption of urban surface.
(iii) the reduced consumption of heat by process.

- **Ribbon Corridor:**

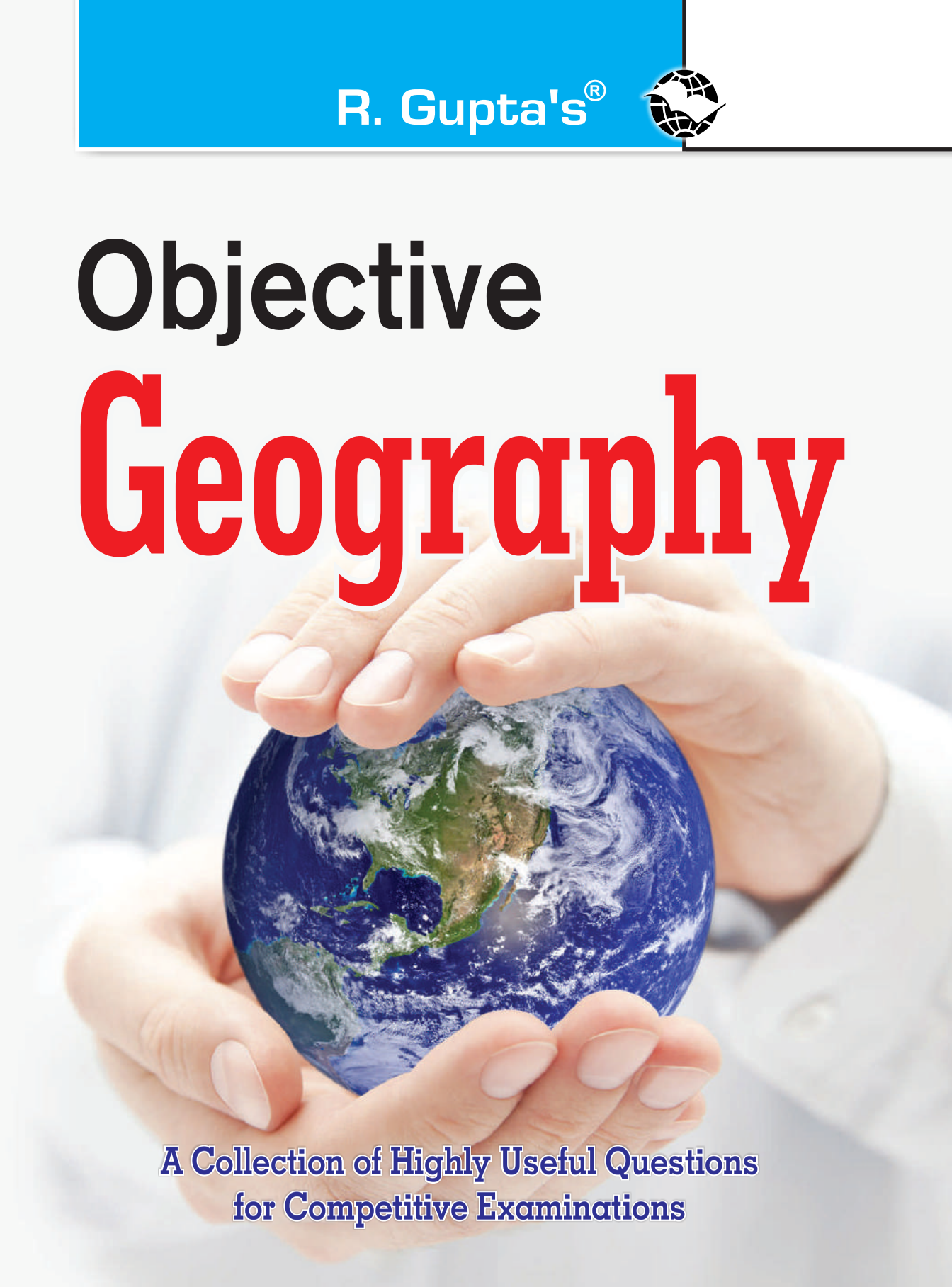
'A form of urban sprawl in which development takes place along one or both side of main radial roads leading out of a built-up area.'

Umland:

'The land bet^n urban & rural areas where daily goods are transported'.

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Objective Geography



A Collection of Highly Useful Questions
for Competitive Examinations

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By
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OBJECTIVE GEOGRAPHY

1 Solar Systems and General Geography

1. Which of the following statements is/are correct with regard to lines of latitude?
1. They are concentric circles numbered from 0° to 90°.
2. They are circles on a globe which are parallel to the equator.

Select the correct answer using the code given below:
A. 1 only B. 2 only
C. Both 1 and 2 D. Neither 1 nor 2

2. Foucault experiment is proof of which one of the following?
A. Revolution of Earth
B. Rotation of Earth
C. Rotation of Moon
D. Revolution of Moon

3. Which one of the following pairs is not correctly matched?

Month	Position of Sun
A. June	Midday Sun overhead at tropic of Cancer.
B. December	Midday Sun overhead at tropic of Capricorn.
C. March	Midday Sun overhead on Equator
D. September	Midday Sun overhead on Arctic Circle

4. Which of the following statements is/are correct with regard to Milky way?
1. It is a spiral galaxy.
2. The solar system resides in one of its spiral arms.

Select the correct answer using the code given below:
A. 1 only B. 2 only
C. Both 1 and 2 D. Neither 1 more

5. Which one of the following is the time required for the earth to return to a given point in its orbit with reference to fixed stars called?
A. Lunar year B. Solar year
C. Tropical year D. Sidereal year

6. How much of a time period 15° of longitudes account for?
A. 4 Minutes B. 15 Minutes
C. 30 Minutes D. 60 Minutes

7. The Sun is visible a little before the actual sunrise because of which one of the following?
A. Atmospheric reflection
B. Atmospheric dispersion
C. Atmospheric diffraction
D. Atmospheric refraction

8. **Assertion (A):** The tail of comet is always away from the Sun.
Reason (R): The tail of comet is made up of gases and small ice particles.

Select the correct answer using the codes given below:

Codes:
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

9. Which of the following is called a **'red planet'?**
A. Earth B. Venus
C. Jupiter D. Mars

10. **Assertion (A):** Venus is the brightest object in the sky after the Sun.
Reason (R): Venus is the second planet from the Sun in hour solar system.

Codes:
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is False
D. A is false but R is true

11. If there are four places on the same meridian 500km apart and the local time at one place is 12.00 noon. What will be the time at the three other places?
A. 12.00 noon
B. 1.00 pm
C. 2.00 pm
D. Different time at different places

12. Which one of the following figures represents the age of the earth?
A. 4.6 million years
B. 4.6 billion years
C. 13.7 billion years
D. 13.7 trillion years

13. The moon is showing its same face to the earth because:
A. It is not rotating about its own axis
B. Its rotation and revolution are opposite
C. Its periods of rotation and revolution are the same
D. Its rotation is faster than its revolution

14. The difference in the duration of day and night increases as one moves from:
A. west ot east
B. east and west of the prime meridian
C. poles to equator
D. equator to poles

15. Which of the following planets does not belong to the group of terrestrial planets?
A. Mercury B. Venus
C. Uranus D. Earth

16. The pulsating universe theory says:
A. The universe illuminates and darkness alternately between periods of billions of years
B. The universe enlarges and shrinks alternately
C. The universe expands and contracts alternately between periods of tens of billions of years
D. All of the above

17. **Assertion (A):** Jupiter is known as a cold planet.
Reason (R): Jupiter has temperature of −130°C.
A. Both A and R are true and R doest not explains A
B. Both A and R are true but R is the correct explanation of A
C. A is true but R is false
D. A is false but R is true

18. Which is the theory that explains the origin of universe from a priomordial explosion which broke the condensed matter and scattered its fragments into space at enormous velocities?
A. Big Bang theory
B. Infinite time theory
C. Steady state theory
D. Oscillating universe theory

19. The study of universe on grandscale is called:
A. cosmology B. astronomy
C. exbiology D. astrology

20. Which of the following planets has been given the name of cruel planet in the Indian astrology?
A. Mercury B. Saturn
C. Neptune D. Jupiter

21. The sum total of potentially knowable objects is called:
A. Universe B. Galaxy
C. Earth D. Milkyway

22. The earth is in.....position from the sun in the solar system.
A. 3rd B. 2nd
C. 4th D. 5th

23. Which of the following statements correctly explains Andromeda?
A. It is the upper surface of the sun which emits white light
B. It is the satellite revolving round the planets of the sun

C. It is the nearest galaxy to our earth
D. It is the gravitational force by which the sun attracts the planets towards its centre

24. Which of the following planets takes 164 years in making one revolution around the sun?
A. Neptune B. Mars
C. Saturn D. Uranus

25. The sun completes one revolution around the centre of the milky way in.....million years.
A. 250 B. 84
C. 110 D. 320

26. The term territorial water means:
A. the water found within the country in form of rivers and lakes
B. the water secured from other countries
C. the water which is supplied to other countries
D. water of the sea located close to the cost of a country

27. More than half of the world's population lives in latitudes.
A. 0° – 20°N B. 0° – 20°S
C. 20°N – 40°N D.40° – 60°N

28. Which of the following planets have highest density?
A. Earth B. Mars
C. Mercury D. Venus

29. Which of the following pair of factor is responsible for a lag of 52 minutes in two direct tides on the earth's ocean surface?
1. Earth's rotation
2. Earth's revolution
3. Moon's rotation
4. Moon's revolution

Code:
A. 1 and 2 B. 2 and 3
C. 3 and 4 D. 1 and 4

30. Which of the following statement regarding earth is correct?
1. The earth is satellite in the solar system.
2. The earth is an asteroid in the solar system.
3. The earth is the 3rd largest body in the solar system.
4. The earth is a planet in the process of being a satellite.

A. 1 and 2 are correct
B. 2 and 3 are correct
C. 3 and 4 are correct
D. None are correct

31. An ancient star that has collapsed matter so dense that it creates gravitational force so powerful that even light also does not escape. It is called:
A. Black hole
B. QSO
C. Neutron Star
D. All the above

32. If sun dies it will be transformed into a:
A. Qusar
B. White dwarf
C. Black dwarf
D. All of the above

33. The sun contains over.....of the total mass of the solar system:
A. 2% B. 82.5%
C. 98% D. 99.8%

34. **Assertion (A):** The earth is also known as watery planet.
Reason (R): The earth is the only planet of the solar system which contains water in abundance.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not correct explanation of A
C. A is true but R is false
D. A is false but R is true

35. The most important constituent of the sun's mass is:
1. Silicon 2. Iron
3. Hydrogen 4. Helium
A. 1 and 2 B. 2 and 3
C. 3 and 4 D. 1, 2, 3 and 4

36. All the planets revolve around the sun in an elliptical orbit in the.....direction.
A. variable B. clockwise
C. anticlockwise D. same

37. The distance between planets from the sun can be described by:
A. Newton's Law
B. Bode's Law
C. Hawkin's Law
D. None of the above

38. Each planet tends to be roughly twice as far from the sun as its next sunward neighbour. This is called:
A. Bgnolds's Law B. Bode's Law
C. Playfair's Law D. All of the above

39. When there is winter solstice (Dec 22), which one of the following angle would be formed by the incidence of the sunrays over the tropic of cancer?
A. $23\frac{1}{2}°$ B. 43°
C. 47° D. $66\frac{1}{2}°$

40. Match the following:

(a) Mercury	1. No Atmosphere
(b) Mars	2. River Channel
(c) Jupiter	3. Planet which could have been star
(d) Saturn	4. Rippling bands

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	3	4	1	2
B.	1	4	4	2
C.	1	2	3	4
D.	2	3	1	4

41. Day and night on the surface of the earth are caused by:
A. inclination of the earth axis.
B. rotation of the earth
C. precession of the equinoxes
D. all of the above.

42. On.....the sun rises in the west:
A. Venus
B. Mercury
C. Jupiter
D. Neptune

43. Seasonal changes on the earth surface are caused by:
A. Earth's revolution
B. Earth rotation
C. Earth rotation and inclination of its axis,
D. Earth revolution and inclination of its axis.

44. When the earth is at its maximum distance from the sun it is called:
A. sidereal B. equinox
C. aphelion D. perihelion

45. Earth can be the best described as a:
A. Geoid
B. Oblate sphere
C. Cirde
D. Sphere

46. The planet which takes the longest time to complete one revolution around the sun is:
A. Neptune B. Saturn
C. Uranus D. Jupiter

47. The direction of rotation of the earth on its axis is:
A. East to west B. North to south
C. West to east D. South to north

48. The theories, which suggests that planetary systems form as part of the evolution history of some stars are grouped into:
A. Natural theories
B. Catastrophic theories
C. Cataclysmic theories
D. Meteoritic theories.

49. Match the following:

(a) Meteorite theory	1. Jeans and Jeffreys
(b) Supernova Theory	2. Hoyle
(c) Tidal Theory	3. Ottosmidt

Codes:

	(a)	*(b)*	*(c)*
A.	3	1	2
B.	3	2	1
C.	1	3	2
D.	2	3	2

50. Match the following theories of the origin of the earth and their proponents:

(a) Nebular Hypothesis	1. Kant

(b) Proto Planet	2. Von wizsacker
(c) Planetesimal Theory	3. Chamberlin
(d) Binary Star theory	4. Russel and Littleton

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	1	2	3	4
B.	4	3	2	1
C.	3	2	1	4
D.	4	1	2	3

51. Sideral means:
A. Pertaining or referring to the stars.
B. Pertaining or referring to the sun
C. Pertaining or referring to the moon.
D. Pertaining or referring to cosmic bodies.

52. In Solar System which two planets are on either side of earth?
A. Mars and Venus
B. Saturn and Jupiter
C. Mars and Saturn
D. None of these

53. Which planet if it was to brought on the ocean will float?
A. Jupiter B. Uranus
C. Mars D. Saturn

54. Which planet has the largest equatorial radius?
A. Saturn B. Jupiter
C. Mars D. Earth

55. Latitude of a place is determined by:
A. Gnomon.
B. clinometer.
C. establishing the meridian of a place.
D. dividing the circumference by angular distance.

56. The location of place A is at 60°E longitude and 30°S latitude while the location of B is 60°E longitude and 45°N latitude. Time at B will be:
A. half-an-hour behind A
B. half-an-hour ahead of A
C. half-an-hour ahead or behind that of A
D. the same as that of A

57. Latitudes refers to:
A. angular distance of a point on the earth's surface along a Meridian Nor S of equator.
B. angular distance of a Meridian in relation to sun's rays
C. angular distance of any elliptical plane in relation to the tilt of the earth
D. angular distance of a plane in-relation to angle of sun's rays

58. The meaning of longitude is:
A. the angular distance of a line around central Meridian
B. the angular distance of a point on the earth's surface east or west of central Meridian.
C. the linear distance from the central part of the earth measured in angles.
D. the curvilinear distance measured from any point in relation to a central point.

59. The interval of 1° latitude measures:
A. 211 kilometres B. 111 km
C. 91 km D. 241 km

60. There is a continuous day of six months and night of six months beyond.
A. $66\frac{1}{2}$° Lat. B. 90° Lat.
C. 75° Lat D. 45° Lat.

61. The linear distance of a degree of latitude on an average is:
A. 79 miles B. 69 miles
C. 70.6 miles D. 72 miles

62. Longitudes unlike latitudes are not used for measuring distance because:
A. longitudes are vertical
B. all the longitudes coverage at poles.
C. The length of degree of longitude outside the tropics vary widely.
D. Longitudes are Horizontal

63. Every.....degree we go eastward local time is.....by one hour.
A. 15°, advanced B. 15°, retarted
C. 10°, advanced D. 10°, retarded

64. Which of the following statement is true:
1. The earth rotates 1° in 4 minutes.
2. Places east of Greenwich see the sun earlier
3. Longitudes keep changing with international agreements
4. At 75° latitude the longitudes are 18 miles.

A. 1, 2 and 3 B. 1, 2 and 4
C. 1, 3 and 4 D. 2, 3 and 4

65. A place located 74°W of Greenwich will have time:
A. 5 hrs. 42 minutes advanced
B. 5 hrs. 42 minutes behind
C. 4 hrs 56 minutes behind
D. 4 hrs 56 minutes advanced

66. In which country, people will have to adjust their watches maximum times to conform to the time zones.
A. Russia B. Canada
C. USA D. Chile

67. The international date line which is at..... is.....hrs ahead of GMT.
A. 90°W, 12. B. 90°E, 12.
C. 180°W, 24 D. 180°E, 12

68. The earth revolves around the sun in an elliptical orbit at a speed of .....per second.
A. 16.5 km/s
B. 22.5 km/s
C. 18.5 miles or 29.8 km/s
D. 29.5 km/s

69. A leap year consists of:
A. 364 days
B. 365 days
C. 366 days
D. 365 days and an extra night

70. The earth takes about.....to complete one rotation.
A. 23 hours
B. 24 hours
C. 24 hours. 6 minutes
D. 23 hours 54 minutes

71. Match the following:
(a) Summer solstice 1. June 21
(b) Winter solstice 2. December 22
(c) Vernal equinox 3. March 21
(d) Atumnal equinox 4. September 23

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	4	3	2	1
B.	1	2	3	4
C.	3	4	2	1
D.	4	3	1	2

72. Match the following:

1. Tropic of cancer *(a)* $23\frac{1}{2}°$N
2. Tropic of Capricorn *(b)* 23°S
3. Prime Meridian *(c)* 0° Longitude

Codes.
A. 1a, 2b, 3c B. 1c, 2b, 3a
C. 1c, 2a, 3b D. 1a, 2b, 3b

73. The first person to say that the earth is sphere was:
A. Archimedes B. Copernicus
C. Galileo D. Eratosthenes

74. The lengthiest shadow will be found in:
A. Vostok B. Archorage
C. Spitsbergen D. Teradel feugo

75. The asteroidal belt lies between:
A. Earth and Mars
B. Jupiter and Mars
C. Mercury and Uranus
D. Neptune and Venus

76. When the moon is nearest to the earth, it is called to be in:
A. Perigee B. Apogee
C. Penumbra D. Umbra

77. The ocean of tranquillity is located on:
A. Mercury B. Earth
C. Moon D. Jupiter

78. Which of the following statment is/are correct?
1. We see only one face of the moon.
2. The moon takes the same time in completing one revolution around the earth and one rotation on its axis
3. The gravitational force on the moon is 6 times less than that of the earth
4. The day and night temperatures vary widely on the moon.

A. 1 and 2 are correct
B. 1, 2 and 4 are correct
C. 2, 3 and 4 are correct
D. All are correct

79. Which planet experiences a day-almost—(1.00 and 1.03 day) of the same duration as that of the earth:
A. Mercury B. Saturn
C. Mars D. Uranus

80. A peninsula is:
A. a piece of land surrounded by water on three sides.
B. a narrow piece of land.
C. a piece of land elongated and surrounded by water.
D. a triangular piece of land surrounded by water.

81. Which of the following is a difference between a gulf and a bay?
A. A gulf occupies the mouth of a river a bay occupies the mouth of many rivers
B. A gulf is of large size while bay is of small size
C. A gulf is a lowland region while a bay is a highland
D. Bay and gulf are both part of sea that extended into the land but a gulf has a narrow entrance that a bay.

82. A narrow creek of land that connects two larger land masses is called:
A. Peninsula B. Isthmus
C. Strait D. Cape

83. The name given to a widened river..... mouth at the point of a river enters the sea is:
A. Estuary B. Delta
C. Gulf D. Bay

84. .....is a triangular landmass that forms at its mouth when a river splits into several branches just before entering the sea.
A. Gulf B. Delta
C. Isthmus D. Strait

85. The name "cross roads of the pacific" is given to:
A. Barmuda B. Fiji
C. Hawaii D. Elice

86. Rapidly rotating stars emitting intense radio waves are called:
A. Neutron stars
B. Pulsars
C. Quasuars
D. All of the above

87. Cygnus X – 1 is a:
A. Binary star of a black hole.
B. Black hole
C. X-RAY source
D. Supernova.

88. Which of the following statements can be taken as evidence to show that the Earth is spherical?
A. The rotation of the earth from east to west.
B. Earth's various parts have night or day.
C. The horizon of the earth is seen to be curved when see from satellite.
D. The revolution of the earth around the sun.

89. Solar eclipse takes place when:
A. The earth comes between the sun and the moon.
B. The moon passes between the sun and the earth
C. The sun comes between the earth and the moon.
D. Planets of the solar system lie on the same plane.

90. Which latitude will have longest nights in the southern Hemisphere at the summer solstice?
A. 66°S B. 45°S
C. 66°N D. $23\frac{1}{2}$ °N

91. The reclaimed portions of the sea in Netherlands are called:
A. Ria B. Polders
C. Young pits D. Sounds

92. Match the following:

(a) Isoplesths	1. Similar value of particular, phenomenon
(b) Isonomal	2. Continuous value on maps.
(c) Isochrones	3. Equal travel time from a common centre.

Codes:

	(a)	*(b)*	*(c)*
A.	3	1	2
B.	1	2	3
C.	3	2	1
D.	2	3	1

93. Match the following:

(a) Isohypes	1. Equal flowing date.
(b) Isophene	2. Equal Seismic activity.
(c) Isoseismal	3. Equal elevation above sea.

Codes:

	(a)	*(b)*	*(c)*
A.	3	1	2
B.	1	2	3
C.	2	3	1
D.	3	2	1

94. The points in the heavens that is directly above the observer is:
A. Apogee B. Perigee
C. Pericline D. Zenith

95. An imaginary belt of 12 constellations or group of star is called:
A. Pulsar B. Zodiac
C. Stellar group D. Zodiacal light

96. When the sun is shinning vertically over the tropic of cancer.
A. Nights are equal to 24 hours at the South Pole.
B. Days and nights are of 16 hours duration at North Pole.
C. Days and nights are equal in northern and southern Hemisphere.
D. Nights are longer than days in the northern Hemisphere.

97. Which of the following is not connected with proof of the earth shape?
1. Circumnavigation
2. Rotation
3. The shadow of the earth on moon during eclips
4. Satellite Photographs
A. 1 and 2 B. 2 and 3
C. 1, 2 and 3 D. All of them

98. Lunar eclipse means:
A. The average angle made by a line drawn from the moon to the earth
B. The earth comes between the sun and the moon and the centres of all the three come on the same straight line
C. Direction or path of the moon.
D. The moon comes between the sun and the earth and it causes shadows of the moon to fall on the earth.

99. Insular means an area:
A. surrounded by land on all sides.
B. surrounded by water on all sides
C. slightly elevated from the adjoining region.
D. drained by rivers from all sides.

100. Doldrums are:
A. a low pressure belt around the equator where the winds are very light and sea very calm,
B. areas of calm seas.
C. trade wind belts.
D. areas where the sea is very rough around equator.

101. Horse latitudes are:
A. tones where fodder for horses are grown
B. latitudinal zones where under some climatic conditions horses originated.
C. subtropical high pressure belts
D. latitudinal zones intermediate between equator and tropics.

102. The region lying between tropics of cancer and capricorn is called:
A. Horse Latitutdes B. Subtropical zone
C. Torrid zone D. All of the above

103. An oasis is:
A. the name of an environmental organisation.
B. farmlands of Australia

C. another name of depression in desert.
D. a small area of greenery and water in desert

104. Which explorer's expedition conclusively proved that the earth is spherical in shape?
A. Christopher Columbus
B. Vasco da Gama
C. Captain Tasman
D. Megellan

105. The height of land is expressed in:
A. feet or metres above sea level
B. metres
C. spot heights
D. kilometres

106. The period of cycle of solar activity (appearance and disappearance) of sun spots is about..... years.
A. 5 B. 11
C. 8 D. 17

107. The three main is land groups in the pacific from east to west are:
A. Melanesia, Polynesia and Micronesia.
B. Micronesia, Polynesia and Melanesia.
C. Melanesia, Micronesia and Polynesia.
D. Polynesia, Micronesia and Melanesia.

108. The name for "Lands end" that is the tip of the last land that projects into the sea is:
A. Embayment B. Head land
C. Cape D. Peninsula

109. Had there been equator in place of tropic of cancer in India, the change caused in the climate would be :
A. Low temperature and high rainfall.
B. High temperature and high rainfall.
C. High temperature and low rainfall.
D. Low temperature and low rainfall.

110. Which of the following is the largest star?
A. Sun B. Silion Aurigae
C. Trumpler D. Betelgeuse

111. The tropics extend from north to south for.....degrees.
A. 11.75 B. 23.5
C. 47 D. 30

112. The basic difference between a lake and a tank is:
A. lake and tank are both land enclosed water bodies but tank is man made.
B. a tank is big while lake is small.
C. a lake is big while tank is small
D. a lake can be in oceans as well as land, tank is only on land

113. The southern limit of India (mainland) is:
A. 6°4' N Lat.
B. 7°4' N Lat.
C. 8°4' N Lat.
D None of these

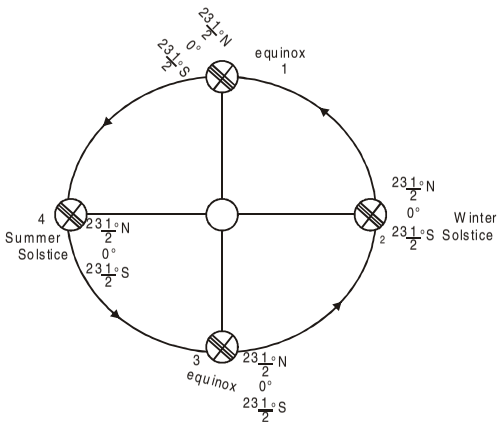
114. The shortest distance between two places on the globe lies along.
A. 45°N Lat.
B. 45°S Lat.
C. The prime meridian
D. The equator

115. Consider the following diagram and answer the question.



the figure indicates:
A. Lunar eclipse B. Solar eclipse
C. Full Moon D. Tidal bore

116. Which of the following options correctly represents the numbers 1, 2, 3, and 4 respectively in the following figure of solstices and equinoxes.



A. March 21, December 22, September 23, June 21
B. December 22, September 23, June, 21, March 21,
C. September 23, June 21, March 21, December 22.
D. June 21, March 21, December 22, September 23

117. The latitude of a place situated on the equator is:
A. $23\frac{1}{2}^\circ$ B. 0°
C. $66\frac{1}{2}^\circ$ D. $33\frac{1}{2}^\circ$

118. **Assertion (A):** Days and nights all over the globe except the equator and the poles are of varying lengths at different times of the year.
Reason (R): The earth's axis is oblique and it points in the same direction throughout the year.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

119. The earth rotates.....in 24 hours.
A. 180° B. 90°
C. 60° D. 360°

120. The Indian standard time is ahead of G.M.T. by:
A. 1 hour B. 3 hours
C. $4\frac{1}{2}$ hours D. $5\frac{1}{2}$ hours

121. When and where was 180th meridian designated as international Date Line by international meridian conference.
A. 1884 Washington D.C.
B. 1804 Tokyo
C. 1894 London.
D. 1824 Dumraon

122. **Assertion (A):** The method of determining latitude of a place with the help of pole star cannot be employed in the southern hemisphere.
Reason (R): There is no star equivalent to pole star in the southern hemisphere.
A. Both A and R are true and R is the the correct explanation of A
B. Both A and R are true but R is not correct explanation of A
C. A is true but R is false
D. A is false but R is true

123. Halo' around the sun or moon are produced due to:
A. Refraction of light by ice crystals
B. Refraction of light by stone
C. Reflection of Light by stone
D. Reflection of Light by Ice crystals

124. **Assertion (A):** It is inferred that life was originated in the ocean.
Reason (R): Simpler and lower animals are aquatic and the cells and body fluids of all animals contain salts
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

125. The primitive atmosphere of the earth was devoid of free oxygen but rich in:
A. Nitrogen and ozone.
B. Carbon dioxide and nitrogen
C. Amonia, methane and hydrogen
D. Methane and carbon dioxide.

126. **Assertion (A):** Elements like hydrogen, oxygen, carbon and nitrogen could not exist in free state on primitive earth
Reason (R): The temperature of primitive earth was estimated to be 5000–6000°C.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

127. **Assertion (A):** The organic compounds that arose on primitive earth were not subjected to degradation.
Reason (R): The Atmosphere of primitive earth was without free-oxygen (non oxygenic)
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

128. If stars are seen to rise perpendicular to the horizon by an observer, he is located on:
A. North Pole B. South Pole
C. Tropic of Cancer D. Equator

129. Consider the following astral bodies:
1. Sirus
2. Venus
3. Mars
Correct sequences in decreasing order of their brightness is:
A. 2, 3 and 1 B. 1, 2 and 3
C. 3, 2 and 1 D. 2, 1 and 3

130. An aeroplane takes off from 30°N latitude 50° East long and lands at the opposite end of the earth where does it land?
A. 30° North Lat. 50° West long.
B. 30° South Lat. 50° West long.
C. 50° North Lat. 30° West long.
D. 30° South Lat. 130° West long.

131. The length of its day and the tilt of its axis are almost identical to those of the earth. This is true.
A. Neptune B. Saturn
C. Mars D. None of these

132. The shortest air route from perth to London is:
A. Perth — Bombay — Rome — London.
B. Perth, Aden, Paris, London.
C. Perth, Ankara, Paris, London.
D. Perth — Mombasa — Rome — London

133. When it is noon along 82°30'E longitude along what degree of longitude it will be 6.30 am?
A. along 165°E
B. along 67°30'W
C. 0°E or W

134. The time taken by the sun to revolve around the centre of our galaxy is:
A. 500 million years.
B. 250 million years.
C. 100 million years.
D. 25 million years.

135. The colour of a star is an indication of its:
A. luminosity
B. distance from the sun
C. temperature
D. distance from the earth

136. Comet shoemaker-levy, hit the planet.
A. Jupiter B. Mars
C. Saturn D. None of these

137. A meteor is:
A. a rapidly moving star
B. a piece of matter which has entered the earth's atmosphere from outer space
C. a slowly moving star
D. a piece of matter which has entered the earth's atmosphere from inner space

138. The standard time of the following countries is ahead or behind Greenwich mean time depending on whether they are east and west of the longitude passing through Greenwich:
1. Cuba 2. Greece
3. Iraq 4. Costarica
5. Japan
Which one of the following sequential order gives the correct arrangement of the countries according to their standard time from a head to behind G.M.T.?
A. 5, 3, 2, 1, 4 B. 2, 4, 1, 3, 5
C. 4, 1, 3, 2, 5 D. 3, 5, 4, 1.2

139. Consider the following statements. A person in a spaceship located halfway between the earth and the sun will notice that the:
1. Sky is jet black.
2. Stars do not twinkle.
3. Temperature outside the spaceship is much higher than that on the surface of the earth.

Of these statements
A. 3 alone is correct
B. 1 and 2 are correct
C. 1 and 3 are correct
D. 1, 2 and 3 are correct

140. Diamond ring is a phenomenon observed:
A. at the start of a total solar eclipse.
B. at the end of a total solar eclipse.
C. only in the central regions of the totality trail.
D. only along the peripheral regions of the totality trail.

141. Which one of the following longitudes along with the prime meridian forms a great circle on the globe?
A. 180° B. 90°E
C. 0° D. 90°W

142. Captain of a ship moving westward records the local time of the 10.00 hrs. Monday at 90°W. If the speed of the ship is the same as the speed of the rotation of the earth, which of the following local time and day would be found by the captain at international date line.
A. 04.00 Monday B. 10.00 Monday
C. 10.00 Tuesday D. 16.00 Tuesday

143. Consider the following statements and select the correct answer from the codes given below:
1. The northern end of the earth's axis is called north pole.
2. 45 parallel is half of the length of the equator
3. There is parallelism of the earth axis.
4. The earth's speed of revolution is faster in aphelion position.

A. 1 and 3 B. 1 and 2
C. 3 and 4 D. 1 and 2

144. Which one of the following may have alien life because of a very conductive environment to life ?
A. Europa—The Jupiter's Moon.
B. Moon—The earth's Moon.
C. Jupiter
D. Mars

145. On which planet was the space craft "Magellan" sent?
A. Saturn B. Mars
C. Venus D. Jupiter

146. What is Hale-Bopp?
A. A toy
B. Cartoon character
C. Comet
D. International company

147. **Assertion (A):** The atmosphere receives most of the heat only in directly from the sun and directly from the earth's surface.
Reason (R): The conversion from short-wave terrestrial energy takes place at the earth's surface.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

148. The shortest distance betweem two places on the globe is along:
A. 45°N latitude
B. 45°S latitude
C. Prime meridian
D. International dateline

149. Which is a celestial phenomenon?
A. Bone hole B. Black hole
C. Rainbow D. Comet

150. At the time of the summer solstice in the northern hemisphere the length of the day will be twelve hours at the:
A. Tropic of cancer
B. Tropic of capricorn
C. Arctic circle
D. Equator

151. The planet nearest to the earth is:
A. Jupiter B. Mars
C. Mercury D. Venus

152. At the winter solstice the noon altitude of the sun at the tropic of cancer is:
A. 23.5° B. 43.0°
C. 47.0° D. 66.5°

153. The limit beyond which stars suffer internal collapse is called:
A. Chandrashekhar Limit
B. Raman Effect
C. Aurora Borealis
D. Quasan Zone

154. When there is noon at I.S.T. Meridian people on another place of the earth are taking their 6 O' clock morning tea. The longitude of place is?
A. 17°80' E B. 7°30' W
C. 172°30' W D. 90° W

155. Match List I with List II and select the correct answer by using the codes given below the lists:

List I (Special Character)	***List II (Name of of the planet)***
(a) Smallest planet of the solar system	1. Mercury
(b) Largest planet of the solar system	2. Venus
(c) Planet second from the sun in the solar system	3. Jupiter
(d) Planet nearest to the Sun.	4. Murcury 5. Saturn

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	2	3	5	1
B.	3	5	1	2
C.	4	1	2	3
D.	4	3	2	1

156. One astronomical unit is the average distance between:
A. Earth and the Sun
B. Earth and the Moon
C. Jupiter and the Sun
D. Mars and the Sun.

157. Consider the following statements regarding asteroids:
1. Asteroids are rocky debris of varying sites orbiting the Sun.
2. Most of the asteroids are small but some have diameter as large as 1000 k.m.
3. The orbit of steroids lies between the orbits of Jupiter and Saturn.

Of these statements:
A. 1, 2 and 3 are correct
B. 2 and 3 are correct
C. 1 and 2 are correct
D. 1 and 3 are correct

158. About 50% of the world population is concentrated between the latitudes of
A. 20°S and 40°S B. 40°N and 60°N
C. 5°N and 20°N D. 20°N and 40°N

159. Which one of the following is the most important reason for the establishment of the Vikram Sarabhai Space Centre, at Thumba?
A. The sea is near to the place in the east west and south direction
B. It is a place near to a city in India, which is nearest to the geographic equator.
C. It is situated on the geomagnetic equator.
D. Outer space near Thumba exhibits queer atmospheric phenomena.

160. Along which one of the following meridians did India experience the first-light of the sunrise of the new millennium:
A. 2°30' W B. 82°30' E
C. 92°30' W D. 92°30' W

161. What is the difference between Indian Standard time and Greenwich standard time?
A. – 4 hours and 30 minutes
B. – 5 hours
C. + 5 hours and 30 minutes
D. + 6 hours and 30 minutes

162. Indian standard time is the local time of $82\frac{1}{2}$ °E which passes through.
A. Allahabad B. Delhi
C. Guntur D. Patna

163. Which one of the following places have their standard time that are the same as G.M.T?
1. Accra 2. Dublin
3. Madrid 4. bisbon
Choose the correct answer from the codes given below:
A. 1, 2 and 3 B. 1, 3 and 4
C. 1, 2 and 4 D. 2, 3 and 4

164. Which one of the following is not as astronomical object?
A. Pulsar B. Brittle Star
C. Blackhole D. Quasar

165. The North Pole is always in the light:
A. from September 23 to March 21
B. from March 21 to September 23
C. from June 21 to December 22
D. None of these

166. The solar eclipse achieves totality only in limited geographical regions because:
A. the size of the shadow of the moon on the earth is small as compared to the cross section of the earth.
B. the earth is not smooth flat surface, but has elevations and depressions
C. the trajectories of the earth around the sun and the moon around the earth are not perfect circles.
D. sun rays can reach most of the Peripheral regions of shadow of the moon due to atmospheric refraction

167. The axis of rotation of the earth is tilted by 23.5° to the plane of revolution around the Sun. The latitude of Mumbai is less than 23.5° whereas the latitude of Delhi is more than 23.5°. Which one of the following statements in this regard is correct.
A. The Sun can come overhead at both these places.
B. The Sun will never come over head at either of these places.
C. At Mumbai the Sun can come overhead, but it will never do so at Delhi
D. At Delhi the sun can come overhead but it will never do so at Mumbai

168. Indian Standard Meridian passes through the states of U.P., Chhattisgarh:
A. A.P. and Karnataka.
B. A.P. and Tamil Nadu
C. Karnataka and Tamil Nadu
D. Odisha and A.P.

169. Tropic of cancer passes through the states of Gujarat, M.P., Chhattisgarh:
A. Jharkhand, West Bengal, Tripura and Mizoram
B. Bihar, Tamil Nadu, Sikkim, A.P.
C. A.P., Karnataka, Kerala, Bihar
D. W.B., Bihar, Jharkhand, Assam

170. How many times the international date line deviates from 180° longitude:
A. 4 B. 6
C. 8 D. 10

171. Which of the following is the characteristic property of magnetic north pole?
A. static
B. shifting fast
C. shifting slowly
D. moving at intervals

172. The longitude determining Indian Standard time passes through
A. Ranchi B. Delhi
C. Chennai D. Kolkata

173. Which of the following planets has the maximum number of satellites?
A. Venus B. Jupiter
C. Saturn D. Uranus

174. Sun rises at Kolkata (80°35') at 6.15 am. What will be the time of sunrise at Mumbai (72°50'):
A. 7.00 a.m. B. 6.46 a.m.
C. 6.30 a.m. D. 6.25 a.m.

175. Which of the following statements is not true about "Doldrum"?

A. It is found across all longitudes
B. It is located at the equator
C. It is a zone of feeble westerly winds
D. It is a high pressure belt

176. Match List I with List II and select the correct answer using the codes given below the lists:

List I (Satellite)	***List II (Related Planet)***
(a) Ariel	1. Saturn
(b) Ganymede	2. Jupiter
(c) Phobos	3. Mars
(d) Titan	4. Uranus

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	1	2	3	4
B.	2	3	4	1
C.	3	1	2	4
D.	4	2	3	1

177. Study the following statements regarding 'summer solstice' and select the correct answer from the code given below:
1. The sun is on the cancer.
2. The sun is on the capricorn.
3. The day is longest and night is shortest in the northern hemisphere.
4. The day is longest and night is shortest in the southern hemisphere.

Codes:
A. 1 and 2 are correct
B. 2 and 4 are correct
C. 1 and 3 are correct
D. 2 and 3 are correct

178. A planet's farthest point in its orbit from the sun is known as:
A. Apogee B. Perigee
C. Aphelion D. Perihelion

179. **Assertion (A):** Directions on the earth are entirely arbitrary.
Reason (R): A spherical surface has no edges, beginning or end.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

180. **Assertion (A):** All meridians are great circles.
Reason (R): The great circles divide the earth sphere into two equal parts.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

181. Comets are luminous celestial bodies moving round the:
A. Jupiter B. Earth
C. Sun D. Moon

182. Doldrums are located between:
A. 10°N to 15°N B. 5°S to 10°S
C. 10°S to 15°S D. 5°N to 5°S

183. The latitude of a place expresses its angular position relative to the place of
A. axis of the earth
B. equator
C. north pole
D. south pole

184. Coriolis Force is occasioned by:
A. Pressure differences
B. Temperature differences
C. Relief obstructions
D. Rotation of the earth

185. The planets between Sun and asteroids are:
A. Mercury, Earth, Jupiter and Saturn
B. Mercury, Venus, Jupiter and Saturn
C. Mercury, Venus, Earth, and Mars
D. Mercury, Earth, Venus and Jupiter

186. "Datum" Line denotes.
A. The boundary between India and China.
B. An imaginary line which passes through zero degree meridian.
C. An imaginary horizontal line from where heights and depths are measured
D. The line across which dates change.

187. Consider:
Assertion (A): There is no atmosphere on moon.
Reason (R): Only one part of the moon can be seen from the earth.
Select the correct answer from the code given below.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

188. Consider:
Assertion (A): Hot deserts are situated on the western margins of the continents.
Reason (R): Rain bearing winds in horse latitudes change their direction according to season.
Select the correct answer from the code given below:
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

189. Equinox is a state in which the duration of day and night is equal. It falls on:
A. 10th March and 13th September
B. 21st March and 23rd September
C. 25th March and 31st September
D. None of these

190. Match the followings:

List I	***List II***
(a) Doldrums	1. 5°N to 5°S
(b) Horse Latitudes	2. 30°N to 30° S
(c) Torrid Zone	3. 40° N and 50° S
(d) Roaring Forties	4. 23½° Nand 23½° S

Codes

	(a)	*(b)*	*(c)*	*(d)*
A.	1	2	3	4
B.	1	2	4	3
C.	2	1	3	4
D.	2	1	4	3

191. The stars whose brightness suddenly increases ten to twenty magnitudes or more and then fades into normal brightness are called:
A. Explosion stars B. Supernova
C. Nova D. only B and C

192. Which of the following planets takes least time to complete one revolution around the sun?
A. Mercury B. Earth
C. Mars D. Venus

193. The stars which show varying degrees of luminosity are called:
A. Double Stars B. Binary Stars
C. Luminous Stars D. Cephied Stars

194. **Assertion (A):** The equatorial section of the sun takes 25 days and the polar 30 days to make one rotation about its axis.
Reason (R): All parts of the sun do not rotate with the same speed because of gaseous nature.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

195. Which one of the following theories is associated with the monistic concept?
A. Binary Hypothesis
B. Nebular Hypothesis
C. Planetesimal Hypothesis
D. Tidal Hypothesis

196. The two planets in the solar system which rotate on its axis from east to west are:
A. Saturn, Mercury
B. Mercury, Jupiter
C. Saturn, Mars
D. Venus, Uranus

197. Which star has the largest percentage in the universe?
A. Binary Stars
B. Single Stars
C. Multiple Stars
D. Cephied stars

198. Which of the following planets was worshipped as the most beautiful goddess by the people of Greece in the ancient times?

A. Venus B. Mars
C. Saturn D. Jupiter

199. What form does the milky way Galaxy has?

1. Spiral 2. Elliptical
3. Irregular 4. Crab

A. 1 and 2 B. 2 and 3
C. 3 and 4 D. 2 and 4

200. Galaxies are the best described as:

A. congregation of dust particles and stars that are held together by force of gravity
B. congregation of constellations rotating around the nucleus
C. congregation of primordial dust particles
D. congregation of stars that are held by molecular attraction of the particles

ANSWER

1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
C	B	D	C	D	D	D	C	D	B
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
A	B	C	D	C	C	B	A	D	B
21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
A	A	C	A	A	D	C	A	D	D
31	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
A	C	D	A	C	C	B	B	C	C
41	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**
B	A	D	C	A	A	C	A	B	A
51	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
A	A	D	B	A	D	A	B	B	A
61	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**
B	C	A	B	C	A	D	C	C	B
71	**72**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**
B	A	B	A	B	B	C	D	C	A
81	**82**	**83**	**84**	**85**	**86**	**87**	**88**	**89**	**90**
D	B	B	B	C	B	C	C	B	A
91	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**100**
B	B	A	D	B	A	D	B	B	A
101	**102**	**103**	**104**	**105**	**106**	**107**	**108**	**109**	**110**
C	C	D	D	A	A	D	C	C	B
111	**112**	**113**	**114**	**115**	**116**	**117**	**118**	**119**	**120**
C	A	C	C	A	A	B	A	D	D
121	**122**	**123**	**124**	**125**	**126**	**127**	**128**	**129**	**130**
A	A	A	A	C	A	A	D	B	A
131	**132**	**133**	**134**	**135**	**136**	**137**	**138**	**139**	**140**
C	C	C	B	C	A	B	A	C	D
141	**142**	**143**	**144**	**145**	**146**	**147**	**148**	**149**	**150**
A	A	A	D	B	C	A	C	B	D

151	**152**	**153**	**154**	**155**	**156**	**157**	**158**	**159**	**160**
D	A	A	D	D	A	C	D	C	D
161	**162**	**163**	**164**	**165**	**166**	**167**	**168**	**169**	**170**
C	A	A	B	B	A	C	D	A	A
171	**172**	**173**	**174**	**175**	**176**	**177**	**178**	**179**	**180**
C	C	B	B	D	D	C	C	A	A
181	**182**	**183**	**184**	**185**	**186**	**187**	**188**	**189**	**190**
C	D	C	D	C	C	B	B	B	B
191	**192**	**193**	**194**	**195**	**196**	**197**	**198**	**199**	**200**
B	D	A	B	A	B	B	C	A	A

2 Geomorphology

1. Which one of the following is produced by rain water action?
   A. Gorge B. Cliff
   C. Gully D. Dome
2. Sand duns form a major topographic feature of:
   A. Eastern Rajasthan
   B. Western Rajasthan
   C. Punjab
   D. Gujarat
3. The deepest lake in the world is:
   A. Pushkar lake B. Lake superior
   C. Victoria Lake D. Baikal Lake
4. Vindhyan rocks contain large deposits of:
   A. Lime stone B. Basalt
   C. Lignite D. Iron ore
5. Which one of the following statements is false?
   A. Peninsular region is geologically the oldest part of India
   B. The Himalayas represent the youngest folded mountains in the world
   C. The Western Coast of India has been formed by the depositional activity of rivers
   D. The Gondwana rocks have the largest deposits of coal in India.
6. The only landlocked country in south-east Asia is:
   A. Laos B. Thailand
   C. Malaysia D. Kampuchia
7. Which of the following features is the product of vulcanicity?
   A. Fold Mountain
   B. Escarpment
   C. Geosynclines
   D. Caldera
8. Which of the following landforms is not formed by weathering?
   A. Rift Valley B. Crevasses
   C. Talus D. Yardang
9. Which of the following landforms is formed by glacier?
   A. Tarn B. Lagoon
   C. Lappies D. Doline
10. With what are the Inselberg and Hamada associated?
    A. Glacial erosion B. Wind erosion
    C. River erosion D. Wind deposition
11. The example of an intermontane plateau is:
    A. The plateau of Bolivia
    B. The plateau of Antrim
    C. The plateau of Deccan
    D. The plateau of pantagonia
12. Conard Discontinuity is found.
    A. between crust and mantle.
    B. between sial and sima.
    C. between upper mantle and lower mantle.
    D. between out and inner core.
13. Asthenosphere is:
    A. The Layer beneath the Lithosphere.
    B. The Layer above the Lithosphere.
    C. The Layer beneath the hydrosphere.
    D. None of the above
14. The term Isostasy was used for the first time by:
    A. Daly B. Dutton
    C. Swess D. None of these
15. Repetti Discontinuity can be located between:
    A. sial and sima
    B. outer core and inner core

C. upper mantle and lower mantle
D. crust and mantle

16. Pratt theory is related to:
A. sea floor spreading
B. Isostasy
C. continental drift
D. earthquakes

17. Continental drift refers to the:
A. vertical as well as horizontal movements of the continents on a vast scale.
B. horizontal movement of the continents on a vast scale.
C. vertical movement of the continents on a small scale.
D. horizontal movement of the continents on a small scale.

18. In America, the idea of continental drift was developed by:
A. F.B. Taylor B. Win Davis
C. Daly D. Darwin

19. Which of the following is known as "Island of Precipitation"?
A. Fault Mountains
B. Fold Mountains
C. Dome Mountains
D. Block Mountains

20. Who formulated the hypothesis of sea floor spreading for the first time?
A. Prof. Taylor
B. Prof. W.M. Davis
C. Prof. Harry Hess
D. None of these

21. Mohorovicic Discontinuity is found between:
A. outer and inner core
B. sial and sima
C. sima and outer mantle
D. uper mantle and lower mantle

22. Heiskanen theory is related to:
A. plate tectonics
B. continental drift
C. Isostasy
D. sea floor spreading

23. The hypothesis of plate-tectonics assumes that the earth is composed of:
A. 10 lithospheric plates
B. 15 lithospheric plates
C. 20 lithospheric plates
D. 25 lithospheric plates

24. Which of followning statement is true about Igneous rocks?
A. They have a little amount of fossils.
B. They are porous for water.
C. They are crystalline as well as non-crystalline.
D. These rocks do not contain silica.

25. Gabbro is an example of:
A. Igneous Rocks
B. Sedimentary rocks
C. Metamorphic rocks
D. None of these

26. Following are the examples of Igneous rocks except.
A. Basalt B. Gabbro
C. Dolerite D. Dolomite

27. The Batholiths covering small areas are called:
A. Stocks
B. Dykes
C. Sills
D. Lapoliths

28. Airy theory is related to:
A. Isostasy
B. volcanoes
C. continental drift
D. sea floor spreading

29. Which of the statements is/are true of Igneous Rocks?
1. They are non-porous for water
2. These rocks are not subject to strong erosion
3. These rocks contain silica from 40% to 80%.
A. 1 and 2 are correct
B. 2 and 3 are correct
C. 1, 2 and 3 are correct
D. None of these

30. Lava-obsidian is an example of:
A. Sedimentary
B. Igneous
C. Metamorphic
D. None of these

31. Following are the example of Igneous rocks except.
A. Granite B. Perlite
C. Pumic stone D. Gneiss

32. Which of the following statement is correct?
A. About 60% of the surface rocks are igneous.
B. In thick crust of the earth 90% rocks are igneous and 10% sedimentary.
C. About 20% of the surface rocks are igneous and 80% are sedimentary.
D. About 80% of the surface rocks are igneous and rest are sedimentary.

33. When shale is metamorphased it is transformed into:
A. slate B. phyllite
C. schist D. all of the above

34. Rocksalt, anhydrite and gypsum are all:
A. lithographic deposits
B. detrital deposits
C. organic deposits
D. evaporite deposits

35. What is the difference between conglomerate and Breccia?
A. Conglomerate is round, breccia is angular.
B. Conglomerate is angular, breccia is round.
C. Conglomerate is light, breccia is dark.
D. Conglomerate is porous, Breccia is compact.

36. Red colouration in sedimentary rocks is because of:
A. presence of iron-oxide
B. presence of red sand
C. presense of hydrous oxide
D. all of the above

37. Siltstone belongs to:
A. Arenaceous sediments (sandstone, course siltstone)
B. Argillaceous sediments (siltstone)
C. Rudaceous sediments
D. Inorganic sediments

38. Which of the following statement is incorrect?
A. Sedimentary rocks are made up of broken materials of sedimentary igneous and metamorphic rocks
B. These rocks are also known as strata rocks.
C. The planes separating different layers are caused bedding planes
D. Bedding planes are always inclined.

39. Thickly bedded sediments are termed _____ while thinly bedded sediments are called_____:
A. desiccated, massive
B. cemented, desiccated
C. massive, laminae
D. lamlnae, massive

40. The rock composed mainly of volcanic is called as:
A. Volcanic rocks
B. Ash rocks
C. Tuff
D. Pyroclastic rock

41. The broken materials as result of weathering, which form the source of sedimentary rock is called:
1. clastic sedimentary rock
2. detrital sedimentary rock.
3. non-clastic sedimentary rock.
4. non detrital sedimentary rock.
A. 1 and 2 B. 2 and 3
C. 3 and 4 D. 1 and 4

42. Arrange the following rocks in a descending order in terms of silica content:
1. Basalt 2. Granite
3. Andesite 4. Rhyolite
A. 2, 3, 4, 1 B. 4, 3, 1, 2
C. 1, 2, 3, 4 D. 1, 2, 4, 3

43. Identify the following rock:
1. It is coarse-grained igneous rock consisting essentially of quartz, feldspar and mica.
2. It has a high proportion of silica.
3. It has a less specific gravity.
4. It ranges in colour from light grey to medium grey.

A. Andesite B. Peridotite
C. Gabbro D. Granite

44. An intrusive rock is:
A. volcanic lava solidified before reaching the surface.
B. volcanic lava solidified after reaching the surface.
C. a variety of sedimentary rock.
D. a rock which has resisted erosion.

45. Which of the followning characteristics of a sediment is least likely to change when it becomes a rock?
A. Density B. Texture
C. Porosity D. Composition

46. Rocks with 65 percent silicon oxide are better termed as:
A. Mafic B. Felsic
C. Silicic D. Alkali

47. **Assertion (A) :** The edge of the continental level is submerged to a depth of about 200 m.
Reason (R) : This zone is called the continental shelf.
A. Both A and R are true but R is the correct explanation of A.
B. Both A and R are true but R is not the correct explanation of A.
C. A is true and R is false.
D. A is false but R is true.

48. The boundary between the mantle and core is called:
A. Weichart–Gutenberg discontinuity
B. Lehmann discontinuity
C. Zehmann free velocity Zone
D. None of these

49. The average age of the earth is:
A. 6000 million years
B. 4500 million years
C. 9000 million years
D. 600 million years

50. What is not true about the mantle?
A. It extends from Moho to 2900 km.
B. It forms 83 per cent of the earth by volume and 68 per cent by mass.
C. It is every where in semi plastic state.
D. There is increase in seismic velocity.

51. That is the outer core in liquid is borne out by the fact that:
1. free earth oscillations give underiable evidence of it.
2. the p-waves are reflected back.
3. the L-waves are refracted.
4. the S-waves get lost after entering the outer core

A. 1 and 2 are correct
B. 1 and 3 are correct
C. 1 and 4 are correct
D. All are correct

52. The crust beneath the ocean basins is composed of:
A. Granitic rock
B. Basaltic rock
C. Sedimentary rock
D. Metamorphic rock

53. The most common element in the earth's crust is:
A. oxygen B. silicon
C. hydrogen D. aluminium

54. Which of the following statement is not true?
A. The upper continental crust and the lower continental crust are seperated by a discontinuity.
B. The lower continental crust is relatively more dense.
C. The lower continental crust is chiefly composed of basalts.
D. The upper continental crust is floating on the lower continental crust.

55. Knowledge about the earth's interior can be gained by:
1. density differences with depth
2. seismology
3. free earth oscillation
4. composition

A. 1 and 2 B. 2 and 3
C. 2, 3 and 4 D. 1, 2 and 3

56. Arrange the following constituents of the earth according to its percentage:
1. Silica 2. Titanium
3. Aluminium 4. Iron

Codes:

A. 1, 2, 3, 4 B. 2, 1, 3, 4
C. 1, 3, 2, 4 D. 2, 3, 1, 4

57. Which of the following is not true?
A. Rocks often develop cracks produced by compression or tension which are called joints.
B. In igneous rocks joints are often at right angles to the bedding plane.
C. Limestone and sandstone break into blocks
D. Basalt break into columns

58. Clay is a type of:
A. Impermeable rock
B. Permeable rock
C. Porous rock
D. Hard rock

59. Arrange the following sedimentary rocks in ascending order according to their texture.
1. Gravels
2. Sands
3. Clays
4. Silts
5. Breccia

A. 1, 2, 3, 4, 5 B. 4, 3, 2, 1, 5
C. 3, 4, 2, 1, 5 D. 4, 3, 2, 5, 1

60. Match the following metamorphosed forms:

(a) Graphite	1. Clay
(b) Slate	2. Lime stone
(c) Quartzite	3. Coal
(d) Marble	4. Sand stone

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	1	2	3	4
B.	3	1	4	2
C.	2	1	3	4
D.	3	2	4	1

61. Match the following:

(a) Loess	1. River deposits
(b) Moraines	2. Glacier deposits
(c) Gravels	3. Wind deposits
(d) Sand and clay	4. Sea deposits

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	1	2	3	4
B.	3	2	1	4
C.	4	1	3	2
D.	3	4	1	2

62. **Assertion (A):** The Basalt rocks are formed over the surface, while granite rocks reach the surface only by being exposed by erosion.

Reason (R): Basalt is volcanic rock while granite rock is plutonic rock.

A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

63. Clastic sedimentary rocks are largely or completely made of particles of:
A. eroded rock particles from the land.
B. eroded volcanic matter
C. organic matter
D. mostly clay materials

64. The capacity of rock to transmit water is:
A. permeability
B. porosity
C. oxidation
D. carbonation

65. **Assertion (A):** Clay is porous but is impermeable.

Reason (R): The small air spaces in clay are not arranged in such a way that water can pass through it.

A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

66. Some igneous rocks contian a high percentage of iron, or aluminium or magnesium oxides and are called basic rocks. Which of the following is an example of basic rocks?
A. Gabbro B. Khondalite
C. Charnokite D. Microsyenite

67. What is granite?
A. A common igneous rock that cooled at the surface and is composed of feldspar and pyroxene.
B. A common igneous rock that cooled relatively slowly and is made up of feldspar and quartz.
C. An igneous rock type that is a major constituent of lava.
D. A common mineral that makes up a large part of the earth's crust

68. Soap stone, a massive impure variety of talc which tends itself to carving is also known as:
A. Stealite B. Khondalite
C. Green stone D. Charnockite

69. Some igneous rocks contain a high percentage of silica and are called acid rocks. Which of the following is not an example of acid rocks?
A. Basalt B. Granite
C. Rhyolite D. Syenite

70. Which of the following pairs is the most useful indetermining a rock's origin?
A. Colour and shape
B. Size and weight
C. Composition and texture
D. Density and volume

71. Magnetism in rocks can be acquired by:
1. Lightning
2. Deposition of sedimentary rocks
3. Wheathering of rocks
4. Solidification of magma

codes :
A. 1 and 2 are correct
B. 1 and 3 are correct
C. 1, 3 and 4 are correct
D. 1, 2 and 4 are correct

72. Which of the following characteristics is not found in igneous rocks?
A. They occur in layers according to the depth of formation
B. They contain crystals
C. They do not contain fossils
D. None of these

73. In tropical humid conditions when weathering takes place which of the following is lost from feldspar:
A. Silica B. Calcium
C. Iron D. Potassium

74. Feldspar is silicate of following minerals, which does not come in the group.
A. Aluminium (Al) B. Potassium (K)
C. Sodium (Na) D. Iron (Fe)

75. The seas on the continental shelf is called:
A. arica-sea
B. the epicontinental sea
C. shelt seas
D. Both B and C

76. Find out the correct order, of the composition of sedimentary rocks.
A. limestone, shales, sandstone
B. shales, limestone, sandstone
C. shales sandstone, limestone
D. sandstone, shales, limestone

77. Loess is:
A. Ice deposited sedimentary rocks
B. wind deposited sedimentary rocks
C. only deposits
D. a soil type

78. Till is:
A. sedimentary rocks formed of cementation
B. ice deposited soils
C. ice deposited sedimentary rocks
D. None of these

79. Which of the following is a chemically formed sedimentary rocks?
A. Nitre
B. Breccia
C. Coal
D. Limestone

80. Conglomerate is an example of:
A. organically formed sedimentary rocks
B. mechanically formed sedimentary rocks
C. chemically formed sedimentary rocks
D. none of these

81. Breccia is:
A. an example of igneous rocks.
B. an example of metamorphic rocks.
C. sedimentary rocks formed because of the process of cementation.
D. none of these

82. Rock salt is an example of chemically formed sedimentary rocks. Which of the following is another example?
A. Gypsum B. Breccia
C. Conglomerate D. Salt petre

83. Which of the following features may occur when lava cools at the surface?
A. Basalt plateau B. Sill
C. Batholith D. Laccolith

84. An intrusion of magma along a bedding plane is known as:
A. Sill B. Till
C. Dyke D. Batholith

85. Which of the following features is the product of vulcanicity?
A. Caldera B. Atoll
C. Geosyncline D. Dyke

86. When the Lava is viscous, the volcanic eruption will most like be:
A. mild B. violent
C. moderate D. not certain

87. Following features are related to vulcanicity except:
A. Geyser
B. Fold
C. Dyke
D. Batholith

88. When a mass of magma cuts across the beding plane then it is called:
A. Sill B. Till
C. Dyke D. Laccolith

89. If the lava is of acidic in nature the eruption will be of:
A. quite type B. explosive type
C. mild type D. none of these

90. Of all the eruptions, the most violent type is:
A. plinian type B. vulcanian type
C. vesuvian type D. pelean type

91. The characteristic of the Hawaian type volcano is:
A. periodic eruption with little explosive activity
B. silent effusion of lava with soma explosive activity
C. silent effusion of lava without any explosive activity
D. None of these

92. The most important constituent of volcanic gases, which contributes nearly 90% of the total content of volcanic gases, is:
A. water vapour B. steam
C. CO_2 D. sulphur

93. The light house of mediterranean is:
A. Visuvius volcano
B. Etna volcano
C. Stromboli volcano
D. Mauna loa

94. The nickname 'The valley of ten thousand smokes' is given to:
A. Katmai valley
B. Hibok-Hibok valley
C. Pelee valley
D. Pierre valley

95. Mauna loa is an example of:
A. active volcano
B. dormant volcano
C. extinct volcano
D. plateau in a volcanic region

96. The "Elastic Rebound Hypothesis" of earth quake was propounded by:
A. E.M. Davis B. H.F. Reid
C. Prof. E. Hess D. S.E. Thompson

97. During the earthquake, the shaking is the strongest near the:
A. isoseismal line
B. epicentre
C. focus
D. everywhere

98. It is commonly believed that most of the earth quake originates at a depth from:
A. 50 to 100 km
B. 75 to 100 km
C. 100 km to 150 km
D. 150 km to 200 km

99. Which of the following is responsible for most of the destructive force of the earth quake?
A. P-waves B. S-waves
C. L-waves D. A and B

100. Isodiastrophic represents the line of:
A. Equal disaster B. Equal damage
C. Equal intensity D. Equal epicentre

101. Which of the following represents an ascending order mountains?
A. System, chain, cordillera and range
B. Chain, range, system and cordillera
C. Range, system, chain and cordillera
D. System, range, chain and cordillera

102. The convection current hypothesis is related to:
A. Mountain building
B. Origin of earth
C. Earthquake
D. Volcano

103. Wheathering is:
A. the alternate heating and cooling of rocks.
B. the break up of rocks exposed at the surface.
C. the freezing of water in cracks in rocks.
D. none of these.

104. The density of the earth as a whole is:
A. 2.5 B. 5.5
C. 6.0 D. 5.0

105. The asthenosphere over which the lithosphere is floating is made up of:
A. Gabbro B. Rhyolite
C. Periotite D. Basalt

106. Which of the following statements is/are correct?
1. There is a marked increase in earthquake velocity from mantle to core.
2. The outer core is solid while the inner core is liquid.
3. The outer core is liquid where as the inner core is solid.
4. The core is composed chiefly of nickel and iron.
A. 1 and 2 are correct
B. 1, 2 and 3 are correct
C. 1, 3 and 4 are correct
D. All are correct

107. Three layers of continental crust from top to below are:
1. sedimentary layer
2. granite layer
3. basaltic layer
A. 1, 2, 3 B. 3, 2, 1
C. 2, 1, 3 D. 2, 3, 1

108. The basic difference between oceanic and continental crust is in its:
A. density B. uniformity
C. composition D. structure

109. **Assertion (A):** The crust is floating on the layers beneath them.
Reason (R): The density of the crust is greater than water but lesser than the materials beneath them.
A. Both A and R are true and R is the correct explanation of A.
B. Both A and R are true but R is not the correct explanation of A.
C. A is true but R is false.
D. A is false but R is true.

110. **Assertion (A) :** The moho is the deepest beneath the highest mountain ranges and shallower beneath regions of lower surface elevations.
Reason (R) : The massive portions reach greater depth to obtain the needed buoyancy.

A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true and R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

111. The combined rigid portion of mantle and crust is called:
A. lithosphere B. asthenosphere
C. hydrosphere D. continental rock

112. The more plastic region of the mantle which is largely composed of peridotite and on which lithosphere floats is called:
A. soil B. oceanic block
C. asthenosphere D. lithosphere

113. The mobile belts arranged in linear or arcuate tracts that have been subjected to severe deformation and mountain building and are found near the edges of the continents are called:
A. orogenic belts
B. kratogenic belt
C. seismic belt
D. None of these

114. Which of the following statement about orogenic belts is not true?
A. The young orogenic belts are made of sedimentary rock.
B. The older mountain belt extend to the ocean and abruptly term inate at the continental margin.
C. All the orogenic belts were formed during palaeozoic to cenozoic period.
D. All the orogenic belts have been formed due to plate collision.

115. The following is not a stable block of the earth.
A. Deccan B. Scandinavia
C. Baltic D. Himalayas

116. The Ethiopian plateau is an example of:
A. Volcanic plateau
B. uplifted peneplain
C. regional peneplane
D. peneplain

117. Gypsum, Saltpetre, Pyrite and Haematite all can be found in:
A. sedimentary rocks
B. igneous rocks
C. matamorphic rocks
D. sedimentary and igneous rocks

118. The Red river has very extensive lacustrine plain. it is situated in:
A. S. Asia B. Central Africa
C. N. America D. W. Australia

119. An example for deltaic plain is:
A. Amazon B. Congo
C. Mississippi D. Bengal

120. The steep mounds that do not emerge above the sea level as islands are called:
A. Mantle plume B. Sea mounts
C. Hot spots D. Volcanic islands

121. The most important characteristics of Guyots are:
A. they are very few in nature.
B. they are formed by deposition of sedimentary rocks.
C. they are always tilted.
D. they are truncated and have flat tops.

122. All the islands in the deep ocean basins are:
A. volcanic in origin
B. depositional origin
C. asostatic in origin
D. tectonic in origin

123. The oldest ocean floor is not older than:
A. Triassic period
B. Tertiary period
C. Cretaceous period
D. Jurassic period

124. What is not true of mid oceanic ridges?
A. They are composed essentially of basalt.
B. They are remarkably symmetrical.
C. The age of rocks formed increases away from the crest of the ridge
D. All the ridges were formed in jurassic period.

125. A plateau that lies betwen the mountain and the plain or the oceans are called:
A. piedmont plateau
B. continental plateau
C. intermontane plateau
D. oceanic plateau

126. Which of the following are formed due to the feeling of lakes?
A. Peninsula formation
B. Piedmont plateau
C. Lacustrine plains
D. Alluvium deposits

127. Match the following:

List I	***List II***
(a) The Patagonian plateau	1. Pidmont plateau
(b) The South African plateau	2. Continental plateau
(c) The Bolivian plateau	3. Intermontane plateau

Codes:

	(a)	*(b)*	*(c)*
A.	1	2	3
B.	2	3	1
C.	3	1	2
D.	1	3	2

128. What is rift valley?
A. It is a deep valley formed in between the mountains.
B. It is a valley on the sides of which are huge mountain.
C. It is a sub sided land along a fault leaving a long narrow opening.
D. It is formed between two folds.

129. Intermontane plateau are:
A. dissected by streams
B. surrounded by highlands
C. surrounded by lakes
D. followed by two ridges

130. _____ is a narrow stretch of sea between continental blocks.
A. Marginal ocean basins
B. Sea
C. Headland
D. Lagoon

131. The bottom topography of an ocean can be shown by:
A. hypsographic curve
B. altimetric curve
C. hydrostatic curve
D. contour

132. A depression in a range of mountain or hills is not called:
A. Col B. Gorge
C. Ridge D. Canyon

133. Which of the following facts about continents is true?
1. They are connected in the northern hemisphere.
2. Most continents are roughly triangular in shape.
3. Continents consist of rocks that is less dense than the rock in the ocean basins.
4. The Continental rocks are much older.

Codes:
A. 1 and 2 are correct
B. 2 and 3 are correct
C. 1, 2 and 3 are correct
D. 1, 2, 3 and 4 are correct

134. A regional surface of low relief having an elevation of within a few meters of sea-level and broadly convex is:
A. Basement complex
B. Platform
C. Shields
D. Cratons

135. The essential difference between shields and platform is:
A. Shields are stable part, platform are mobile part
B. Shields are found within the continent but platform are found along continental margins
C. Platforms are covered by horizontal sedimentary strata, which shields are convex in form.
D. Shields are made of granite, plateform of sedimentary rocks.

136. The world's busiest inland waterway is:
A. St. Lawrence
B. Danube
C. Rhine
D. Nile

137. The general trend of Alps mountain is:
A. East-west
B. North-south
C. North east–south west
D. South-south east–North-north west

138. Chad basin in North Central Africa is an example of:
A. internal drainage
B. external drainage
C. intermont plateau
D. tectonic plateau

139. Arrange the following landforms in sequence from south to north:
1. Indo-Gangetic plain
2. Plateau of Tibet
3. Tarim basin
4. Altya tagh
5. Himalayas

Codes:
A. 1, 5, 3, 2, 4 B. 1, 5, 4, 2, 3
C. 1, 5, 2, 3, 4 D. 1, 3, 5, 4, 2

140. ____ is an intermontane plateau and lies between the rockies and wasatch mountains.
A. Colorado plateau
B. Bolivian plateau
C. California
D. Sierra Navada

141. The Great basin of U.S.A. is really a plateau which has been formed by:
A. upliftment
B. high rate of erosion
C. basalt Lava flow
D. block faulting

142. **Assertion (A):** Some of depressions of the great basin of U.S.A. have no external drainage.
Reason (R): The rate of evaporation is very high.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true and R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

143. A well will always contain water if:
A. the bottom of the well is far below the water table.
B. the bottom of the well is above the water table.
C. it is on a spring line
D. it is sunk into igneous rocks

144. The formation of a river delta involves the following processes. In what order do they take place.
A. Deposition, Corrasion, Transport
B. Transport, Corrasion, Deposition
C. Corrasion, Transport, Deposition
D. Deposition, Transport, Corrasion

145. The erosive power of a river depends mostly upon its:
A. speed and volume
B. gradient and slope
C. speed and depth
D. slope and density

146. Deposition by a river increases when:
A. the river approaches a lake.
B. the volume of water in the river increases
C. the volume of water in the river decreases.
D. none of these

147. Following are the landforms produced by faults except:
A. Graben B. Horst
C. Drag D. Nappe

148. Escarpment appears:
A. when a block moves upward
B. when a block slips down along the fault
C. when a block moves vertically
D. none of these

149. Hanging wall is a product of fault activity. It is block that:
A. moves down
B. moves up
C. slips down along the fault plane
D. none of these

150. The following are the example of exogenic forces except one:
A. rivers
B. animals
C. underground water
D. compression

151. Rift valleys are caused by:
A. endogenetic forces
B. exogenetic forces
C. volcanoes
D. earthquakes

152. River deposition can produce:
A. earth pillar B. scree
C. levee D. loess

153. Most favourable conditions for chemical weathering is, when it is:
A. cold and dry B. cold and wet
C. hot and cold D. hot and wet

154. A great anticline which has many small anticlines and synclines is called:
A. Manifold B. Fan fold
C. Gouge D. Nappe

155. 'Paired river terraces' are found in:
A. arid landforms
B. flood plains
C. rejuvenated landforms
D. none of these

156. Gouge is:
A. a kind of rock-waste, produced by the movement of blocks.
B. rough fragments
C. an example of igneous rocks
D. none of these

157. Freeze-thaw is an example of:
A. chemical weathering
B. physical weathering
C. both physical and chemical weathering
D. cementation through glaciation

158. Tor is:
A. weathered block of rocks in round-edged shape.
B. weathered block of rocks in sharp-edge shape.
C. the joints formed on basalt.
D. cap-shaped structure on relict mountains.

159. Metamorphic rocks are formed under:
A. high pressure and low temperature
B. high pressure and high temperature
C. low pressure and low temperature
D. low pressure and high temperature

160. Geographical cycle is:
A. a particular cycle in the evolution of land scape.
B. a retrospective cycle in the evolution of land scape.
C. The evolution of landscape in a cycle which the various stages of development pass through in a definite order.
D. the evolution of landscape in a cycle which the various stages of development pass through in an indefinite order.

161. The evolution of landforms in three stages viz. youth maturity and old stage divided by:
A. Evans B. Ramsay
C. Davis D. Penck

162. The Chernozem soils are associated with the:
A. Australians downs
B. American Prairies
C. African veld
D. Russian Steppes

163. A new climate sets in for a short period during the regime of the climate of an era is called:
A. climatic accident
B. climatic irregularity
C. climatic disturbances
D. none of these

164. Who used the word pene plain for the fist time?
A. Davis
B. Penck
C. Ramsay
D. Kikramay

165. Penck is considered to be forward looking because:
A. he has given less emphasis on geological aspect
B. the basis of his geographical cycle is forward-looking
C. the basis of his geographical cycle is geological
D. all of the above

166. The cold pole of the earth is located at:
A. Murmansk B. Narvik
C. Verkhoyansk D. Yarkutsk

167. Slumping:
A. broaden the valley at sides
B. deepens the river valley
C. increases the length of the river
D. none of these

168. Rapids and waterfalls are produced on:
A. the belt of resistant and soft rocks.
B. the slope
C. the belt of resistant rocks
D. the belt of soft rock

169. Inversion of relief represents a situation when:
A. synclines are higher than adjoining anticlines
B. anticlines are higher than adjoining synclines
C. synclines and anticlines are of equal height
D. only relict of a relief remains

170. The inter-montane plateau of Anatolia in turkey is located between the range of:
A. Pontic and taurus
B. Elburz and zagros
C. Caucasus and Elburz
D. Caucasus and Carpathian

171. An drainage pattern which gives a tree like structure is:
A. dendritic B. trellis
C. annular D. pinnate

172. Godavari has the drainage pattern as:
A. rectangular B. annular
C. dendritic D. trellis

173. The pattern in which tributary streams are long was parallel to the main stream is called:
A. parallel pattern
B. rectangular pattern
C. trellis pattern
D. annular pattern

174. A series of rapids are called:
A. great rapids B. multi rapids
C. cascade D. waterfall

175. Indian example of river capture is:
A. Bhagirathi B. Alaknanda
C. Ram Ganga D. Yamuna

176. When the stream erodes the overlying cover of strata and flows on the exposed undrlying strata in the some direction, such streams are called:
A. obsequent B. insequent
C. resequent D. super imposed

177. The Krishna river has a drainage pattern, which can be called:
A. dendritic B. pinnate
C. annular D. trellis

178. The Yazoo river is a good example of:
A. Questa
B. Defferred junctions
C. Discordant junction
D. Kinck point

179. Ox-bow lake occurs in the:
A. old stage B. mature stage
C. young stage D. both A and C

180. Identification of ecological types is primarily based on:
A. Landforms
B. Climate
C. Soil and vegetation
D. All the above

181. The delta of ob river is an example of:
A. estuarine B. arcuate
C. digitate D. cuspate

182. The delta of Ganga river is an example of:
A. digitate
B. birds' foot
C. arcuate
D. cuspate

183. When the drainage pattern changes from dendritic to rectangular one, the event will be:
A. rejuvenation B. saltation
C. weathering D. inversion

184. Bogas are associated with:
A. glacial region
B. limestone region
C. mountainous region
D. seabed

185. The delta which is formed on the mouth of vistula river can be called:
A. estuarine B. arcuate
C. digitate D. cuspate

186. The Mississippi delta is a good example of:
A. estuarine B. birds' foot
C. arcuate D. cuspate

187. The delta of Mekong and the Nile are good example of:
A. Birds foot B. Arcuate
C. Cuspate D. Estuarine

188. When the old meanders become incised, it is to be called:
A. river has finished its course
B. river is getting dry
C. river is rejuvenated
D. all of the above

189. Karst window is associated with:
A. sandstone topography
B. limestone topography
C. desert topography
D. glacial landforms

190. Hums are found in:
A. arid lands B. flood plains
C. karst land form D. none of these

191. Geodes and vugs are:
A. depositional features in arid zone.
B. depositional features in karst zone.
C. erosional features in arid region
D. erosional features in karst regions

192. The description of cycle-system in karst region was given for the first time by:
A. Cvijic B. W.W. Paris
C. Penck D. Evans

193. Polges are the features of Karst landforms found in:
A. late mature stage
B. youth stage
C. old stage
D. mature stage

194. Sponting horn is another name of:
A. slacks B. uvalas
C. blow holes D. surfs

195. 'Fulls' or 'swells' are:
A. depositional features of shoreline
B. erosional features of shoreline.
C. depositional features in Karst landforms.
D. erosional features in Karst topography

196. Karrens are:
A. fluvo-glacial landforms
B. karst landforms
C. arid landforms
D. none of these

197. Bars and barriers are:
A. related to glacial region
B. depositional features
C. erosional features
D. associated with Karst features

198. Solifluction is:
A. the flow of ice-layer in semi frozen conditions
B. the flow of ice
C. the flow of ice layer in frozen conditions
D. flow of soil creeps

199. Pocket valley is found in:
A. Peri-glacial region
B. Glacial region
C. Karst region
D. Arid region

200. Ria is an example of:
A. deposited land forms
B. emerged uplands shorelines
C. submerged upland shorelines
D. None of the above

201. Karst topography develops very well where:
A. a moderate amount of rainfall occurs
B. the soluble rocks are located near or at the earth surface
C. heavy rainfall occurs
D. only A and B

202. Lapies are found in:
A. Karst region
B. Fluvo-Glacial region
C. Arid regions
D. Glacial regions

203. Pepino hills are:
A. depositional features on beaches
B. small residual hills found on the sea flow
C. small residual hills found on the floors of Polyhedron
D. None of these

204. Dust-well is found in:
A. Glacier region
B. Karst region
C. Limestone region
D. Arid region

205. The glacial process in tundra, a little distance from the ice-sheets is called:
A. periglacial process
B. ultra glacial process
C. extra glacial process
D. None of these

206. Ablation refers to:
A. the process of ice-formation
B. the process of ice deposition
C. melting down of glaciers
D. the frontal parts of the glaciers are destroyed by melting and the glaciers appear to be retreating

207. One of the following lakes of glacier region gives a look of stair case, which one is that:
A. Patermoster lake
B. Tarn lake
C. Cirque lake
D. Ribbon lake

208. Lagoons are found:
A. on the sea-ward side of the fringing-reef
B. between the high water and low water line
C. between the coast and off seabar
D. None of these

209. Dalmation is an example of:
A. shoreline of emergence
B. submerged upland shoreline
C. both A and B
D. None of these

210. Shoreline of emergence occurs due to:
A. fall in sea level
B. rise in sea level
C. decrease in land level
D. increase in land level

211. One of the following landforms look like "The back of sitting sheep" which one is that:
A. Albs
B. Horn
C. Crag and tail
D. Roche Moutonnes

212. In Roche Moutonnes, plucking action is the main activity on the:
A. lower side
B. ascending side
C. descending side
D. either side

213. Which of the following topography resembles upturned boats?
A. Drumlin
B. Roche Mountanne
C. Eskers
D. Boulder's Clay

214. The productivity of natural vegetation is the highest in:
A. Selva region B. Prairie region
C. Monsoon region D. Taiga region

215. Hamada is:
A. combined action of erosion and deposition
B. a depositional feature
C. an erosional feature
D. a cold wind

216. The formation of sand-dunes depend on:
1. availability of sand.
2. the direction of wind and its Persistance.
3. the bed rock.
4. underground water's capacity.

Codes:
A. 1 and 4 are correct
B. 1 and 2 are correct
C. 1, 2 and 3 are correct
D. All of the above are correct

217. Bajada is:
A. advanced form of Hamada
B. erosional feature in Arid Land
C. wind borne depositional feature
D. none of these

218. Bolson is:
A. depositional feature by the wind action
B. associated with river bed
C. associated with karst landforms
D. glacial feature

219. Seif is a sand dune:
A. which is elongated
B. similar to Barkhan
C. similar to Barkhan except one wing is missing
D. none of these

220. Barkhan are:
A. elongated crescentic shaped dunes
B. crescentic shaped dunes with wings directed up wind
C. crescentic shaped dunes with wings directed down wind
D. None of these

221. The dunes whose horns point towards direction opposite to that of following wind are:
A. parabolic dunes
B. longitudinal dunes
C. whale back dunes
D. fore dune

222. Fore dune refers to:
A. small dune before the actual sand dune
B. frontal dune
C. elongated ridges of sand
D. ridge like deposits of wind borne sand along the coast of sea or lake.

223. The space between the dunes is known as:
A. Oasis B. Gasis
C. Duasis D. Interdune area

224. Whale back dune is:
A. large longitudinal dunes with flat tops on which barkhans or seif may occur.
B. seif like dunes
C. parabolic shaped dunes
D. none of these

225. Which one of the following causes acid rain?
A. Carbon monoxide
B. Carbon dioxide
C. Sulphur dioxide
D. Nitrogen oxide

226. Honey-comb-structure is so called:
A. erosional activity is mainly done by wind.
B. these are erosional feature.
C. because these are rocks consisting of hard and soft parts get differential abrasion
D. all of the above

227. The Wular-lake of Kashmir is an example of:
A. a finger lake B. a tarn lake
C. ox-bow lake D. a ribbon lake

228. The most abundant power resources occur in:
A. sedimentary rock
B. metamorphic rock
C. Igneous rock
D. volcanic rocks

229. Inversion of temperature usually takes place in:
A. the snow bound areas of mid-latitude
B. valleys
C. polar regions
D. all of these

230. Which of the following is the product of glacial erosion, transport and deposition?
A. Esker B. Drumlin
C. Nunatak D. Cirque

231. Tides are caused by:
A. gravitational force of the moon.
B. gravitational force of the earth.
C. gravitational force of the sun.
D. both A and B

232. Exfoliation is common in:
A. Deserts B. Mountains
C. Coastal areas D. Arid Lands

233. Salinity of water is highest in the:
A. sub polar region
B. temperate region
C. tropics
D. both B and C

234. Which of the following rocks are known as primary rock?
A. Igneous rock
B. Metamorphic rock
C. Sedimentary rock
D. Both A and C

235. Amphitheatre is another name of:
A. cirque B. hums
C. arete D. horn

236. Arete is:
A. a knife-like ridge where two cirque-walls intersect from opposite side.
B. a sharp ridge produced by glacial erosion.
C. a depression formed by plucking
D. both A and B

237. The higher temperature in the city centre is called:
A. Heat dome B. Heat high
C. Heat trough D. Heat island

238. Serace is:
A. similar to waterfall in a river
B. associated with glacier
C. floating ice-hill on the sea water
D. only A and B

239. Wadies are:
A. depositional features in aridland.
B. depression formed by wind action.
C. associated with glacier.
D. channels formed during rains in desert or arid regions.

240. Playas are:
A. associated with glaciers.
B. associated with humid region
C. associated with arid region
D. lakes found in Karst land forms

241. Strath is:
A. a small escarpment
B. when the width of the valley is less than the width of the river
C. when the width of the valley is greater the width of the river
D. none of these

242. Water falls, gorges and canyons are formed during :
A. initial stage of a river
B. mature stage of a river
C. youth stage of a river
D. old stage of a river

243. Sloughs are:
A. depressions in the arid region.
B. another name of playas.
C. depression on the flood plains of meandering rivers.
D. none of these

244. Glacial drift refers to:
A. drifting in blind valley
B. drifting in Glaciers
C. all debris deposited in a glacial environment
D. none of these

245. Knock-and-Lochan topography:
A. associated with glaciation in low land area
B. is found is arid region
C. associated with melt water erosion
D. none of these

246. Nivation is:
A. melting of snow
B. erosion by snow
C. accumulation of snow
D. none of these

247. The lowest point at which snow manages to remain each year marks the:
A. summer firn line
B. mass budget
C. winter firn line
D. snow line

248. If the folded rocks were covered by horizontal layers upon which the river took its original course and then the river eroded its channel down into the underlying ridges, the river is:
A. obsequent B. antecedent
C. superimposed D. subsequent

249. If the course of the river predates the elevation of the mountain or ridge and yet manage to keep its path, then it is:
A. super imposed B. epigenetic
C. antecedent D. subsequent

250. Insequent stream:
A. demonstrates lack of structural control and that to develop homogenous rock
B. has no apparent reason why it follows the path it takes
C. is very important stream of any river.
D. A and B

251. Resequent rivers are those:
A. which flow in the same direction as the consequent streams but at a lower level
B. which flow in the opposite direction of the main river
C. with flow parallel to the main stream.
D. none of these

252. Braiding occurs generally in:
A. humid region
B. semi-arid region
C. glacial out wash plain
D. B and C

253. Braiding means:
A. the stream does not have the capacity to transport its load in single channle be it straight or meandering.
B. the stream has lots of sub-streams.
C. the stream become thiner
D. none of these

254. Point bars are found in the meandering river:
A. inside of bends
B. pools
C. riffles
D. outer side of bends

255. Which one of the following is related to montreal protocol of 1987.
A. Reduction in the consumption of mineral oil.
B. Reduction in the production of carbon.
C. Reduction in the production and consumption of chloro fluorocarbons
D. Reduction in the production of nitrogen oxides.

256. Helic flow is characteristic of a river when it:
A. meanders
B. is in its youth stage
C. is in the old stage
D. in rejuvenated

257. The shallows between the bends in the meandering river are called:
A. Riffles B. Pools
C. Point bar D. Shallows

258. The deeps in the meandering river at bends are called:
A. Point bars B. Pools
C. Riffles D. None of these

259. Which one of the following is not related to water pollution?
A. Eutrophication
B. Nitrification
C. Biological oxygen demand (BOD)
D. Oil Slicks

260. The hydraulic slope theory is given by:
A. Darwin
B. Daly
C. R.E. Horton
D. None of these

261. Raindrops can cause erosion on the surface soil this is called:
A. erosion through raindrop
B. rain splash
C. splash erosion
D. none of these

262. Bog bursts are:
A. associated with Tsunamis
B. found on glaciers
C. allied to mud flows
D. found in mid-oceanic ridges

263. Graben is:
A. a dropped block
B. a geosyncline
C. an uplifted block
D. none of these

264. Hors is:
A. a dropped block
B. an uplifted block
C. an uplifted fold
D. a geosynclines

265. Epeirogenic movements are characterised by:
A. small scale uplift
B. large scale uplift or submergence of land areas
C. slow and widespread without any obvious folding or fracturing in the rocks
D. B and C are correct

266. Orogenic movements are responsible for:
A. the formation of great fold mountian ranges of the world.
B. the formation of fault mountian.
C. the formation of great continents.
D. A and B

267. Basket-of-eggs topography is:
A. a glacial deposition
B. made up of drumlins usually occur in clusters
C. made up of eskers
D. Both A and B

268. Sandur is:
A. related to karst topography.
B. associated with arid landforms.
C. the main landform created by proglacial deposition.
D. none of these

269. Kame and Kettle topography is:
A. an area of mounds on depressions commonly associated with a stagnant glacier.
B. an area of moundswith a running glacier.
C. a depression
D. none of these

270. Fluvo-glacial refers to:
A. erosion by melt water
B. deposition by melt water streams
C. deposition by water and ice together.
D. deposition by ice

271. Eskers are:
A. long narrow ridges of well sorted materials.
B. long narrow depressions in glaciated regions.
C. small wide ridges.
D. none of these.

272. Involutions are:
A. periglacial phenomena.
B. contorted vertical structures, usually only seen infossil form in pits and quarries.
C. the result of the pressure put on the active layer in permafrost when it begins to refreeze from the surface down wards.
D. all of the above

273. Pingos are:
A. small ice pebbles
B. large ice mounds anything from 10 m to 70 m in height found in the high Arctic
C. large ice mounds found in the Antarctic
D. none of these

274. Gulls are:
A. slope features in periglacial landforms
B. found in the sea
C. found in the arid region
D. none of these

275. Desert varnish are:
A. stones in the desert pavement which have a black or brown coloured polish.
B. due to the presence of iron manganese oxide.
C. A and B are correct
D. A and B are incorrect

276. Dreikanters:
A. they are also called as ventifacts.
B. are many edged shaped stones due to abrasion action of wind.
C. are also known as beveled stone.
D. all of the above

277. Inselbergs are:
A. a plain of eroded bed rock.
B. channels formed during rains.
C. isolated mounds found in the arid regions.
D. mountain tops which have round shapes.

278. Pediment is:
A. even surface in Karst topography
B. a plain of eroded bed rock in a humid region
C. a plain of eroded bed rock in an arid region developed between mountain and basin areas
D. none of these

279. Monadnocks are:
A. equivalent of inselberg in arid region
B. small hillock of hard rocks on the pene plain
C. associated with glacier region
D. A and B are correct

280. Mesa are:
A. an isolated table land area with steep sides found in a humid region
B. An isolated table land area with a gentle slope found in a humid region
C. also known as questa
D. none of these

281. Two cycle theory of cavern development was propounded by:
A. Swinnerton B. Malott
C. Davis D. Bretz

282. Water table theory of cavern development was given by:
A. Swinnerton B. Davis
C. Bretz D. Both A and B

283. Swell and swall topography is:
A. flat till plains made up of claytill.
B. found in Karst region.
C. a Rejuvenated landform.
D. none of these

284. The salties lake in the world is:
A. Lake Vaon B. Lake Assal
C. Dead Sea D. Caspian Sea

285. Most of the lakes in the world are:
A. fresh water lake
B. lagoon lake
C. salt water lake
D. Ice scoured lakes

286. Lagoons in Germany and Poland are called:
A. Nehrungs B. Haffs
C. Beaver dams D. Cooulces

287. Lake Toba, Philippines is an example of:
A. Meteor lake B. Lagoon
C. Crater lake D. Mining lake

288. Which of the following is not an example of rift valley?
A. Tanganyika B. Rudolf
C. Edward D. Maweru

289. Lake Titicaca, a huge depression in the intermontane plateaus of the indus is the result of:
A. meteoritic impact
B. tectonic fracture
C. caldera formation
D. None of these

290. Basin Like hollows found in glaciated surface is made by burial of ice block and their subsequent melting:
A. Pothole B. Kames
C. Craters D. Kettles

291. **Assertion (A) :** Extensive areas of land are sometimes turned into myriads of lakes by morainic deposits.
Reason (R) : Such lake landscapes offer little scope for development by man.

A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true and R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

292. Which of the following feature is formed by wind erosion?
A. Waterfall B. Yardang
C. Uvala D. Torn

293. How many times the international date line deviates from 180° longitude?
A. 4 B. 6
C. 8 D. 10

294. Which of the following is the characteristic property of magnetic north pole?
A. Static
B. Shifting fast
C. Shifting slowly
D. Moving at intervals

295. Which river forms the bigest delta?
A. Hwang Ho B. Nile
C. Irawady D. Mississippi

296. Which one of the following is a tropical grassland?
A. Lonos B. Prairie
C. Steppe D. Weld

297. Which one of the following rivers is the most important for inland transport?
A. Rhine B. Mississippi
C. Amazon D. Hwang Ho

298. In the Himalayas the most severely eroded zone is:
A. High Himalayas
B. Middle Himalayas
C. Sivalik Flanks
D. Trans Himalayas

299. The trees are tall in equatorial region because:
A. they compete for sunlight
B. the land is most fertile
C. there is plenty of water
D. there is high density of carbon dioxide in the region

300. Plains lie generally below 150 m which of the following plains does not conform to this criterion.
A. Great plains of U.S.A.
B. Great plains of India
C. North China plain
D. Indus plain

301. Which of the following agents causes the formation of polije?
A. Underground water
B. Ocean currents
C. Winds
D. Streams

302. Mid Atlantic Ridge has formed due to:
A. folding
B. faulting
C. accumulation detritus
D. drifting of plates

303. Match List I with List II and select the correct match from the code given below:

List I	***List II***
(a) Aravalli	1. Volcanic Mt.
(b) Black forest	2. Relict Mt.
(c) Mt. Cata paxi	3. Folded Mt.
(d) Vindhyas	4. Block Mt.

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	1	3	2	4
B.	2	4	1	3
C.	3	2	4	1
D.	3	4	1	2

304. Which of the following is an antecedent river?
A. Ganga
B. Brahmaputra
C. Yamuna
D. Sone

305. Which of the following soils has a well developed soil profile?
A. Alluvium B. Loess
C. Chernozem D. Till

306. An uplifted landmass undergoes transformation by the process of land sculpture ending into a low featureless plains. The above quotation is associated
A. W. Penck B. C.H Crickmay
C. W.M. Davis D. L.C. King

307. Which one of the following landforms is produced by the headward recession of cirques?
A. Hanging valley B. Fiord
C. Arete D. Esker

308. Hudson-Moho wak valley is located in:
A. France B. U.K.
C. U.S.A. D. Canada

309. Largest fresh water storage of the world lies in:
A. Greenland B. Antarctica
C. Himalayas D. Alps

310. The biggest island in Indian ocean is:
A. Maldive B. Madagaskar
C. Lakshadweep D. Sumatra

311. Consider the following statements:
Assertion (A): Hot deserts are found on the western margin of the continents.
Reason (R): Shifting pressure belts shift North-south according to season.
Select the correct answer from the code given below.
A. Both A and R are true and R is the correct answer of A
B. Both A and R are true and R is not the correct explanation of A
C. A is true, R is false
D. A is false, R is true

312. The biggest hot desert of the world is:
A. Kalahari B. Gobi
C. Sahara D. Thar

313. Victoria lake is located in:
A. United States of America
B. West Australia
C. Bolivia
D. E. Africa

314. Which one of the following is realted to arid environment?
A. Pater noster B. Playa
C. Pingo D. Torn

315. Silicon valley is located in:
A. Scotland
B. California
C. Swiss Alps
D. New England states

316. Which of the following statements is correct?
A. The Atlas range is a folded mountain.
B. Equatorial region is the hottest region on the earth.
C. Laterite soils are found along the malabar coast of India.
D. Rosewood grows in abundance in Tamil Nadu.

317. Shan plateau is located in:
A. Thailand B. Cambodia
C. Vietnam D. Myanmar

318. Study the following statements:
Assertion (A): Rivers meanders in Late mature stage.
Reason (R): This stage is marked by flat and wide valley.
A. Both A and R are true and R is the correct explanation of A.
B. Both A and R are true but R is not the correct explanation of A.
C. A is true, R is false.
D. A is false, R is true.

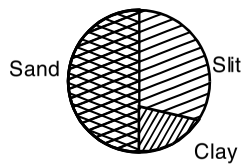
319. The climatic data given below reflects the conditions of which of the following vegetation regions:

	Jan	***April***	***July***	***Oct***
Temp. (0°C)	23.5	16.1	9.4	15.6
Rain (c.m.)	7.9	8.9	5.6	8.9

A. Savana B. Steppe
C. Mixed forest D. Taiga

320. Which one of the following plateaus is not made of lava?
A. Brazilian B. Patogonian
C. Deccan D. Columbia

321. Which type of soil is represented by the following diagram.



A. Clayey B. Loamy
C. Sandy D. Sandy Loamy

322. Stalagmites are formed by:
A. Glacial action
B. Fluvial action/Ground water action
C. Wind action
D. Waves action

323. Consider the following statements:
1. Cirque is found at the head of the glaciated valley
2. The peak of the swiss Alps is the best example
A. Both 1 and 2 are true
B. 1 is true 2 is false
C. 1 is false 2 is true
D. Both 1 and 2 are false

324. Which of the following is not related to plate tectonic theory?
A. Continental drift
B. Pole wandering
C. Transform fault
D. Sea floor speading

325. Telegraphic plateau is a part of:
A. North Atlantic ridge
B. South Atlantic ridge
C. Mid Indian ocean ridge
D. North America

326. Which one of the following is not correctly matched?
A. Exfoliation – Onion weathering
B. Oxidation – Chemical weathering
C. Hydrolysis – Mechanical weathering
D. Carbonation – Chemical weathering

327. The Brahmaputra is an example of:
A. Subsequent river
B. Obsequent river
C. Antecedent river
D. Super imposed river

328. Which one of the following soils found in India has been derived from material deposited by fissure eruptions in cretaceous period?
A. Laterite soil B. Alkaline soil
C. Black soil D. Sandy soil

329. **Assertion (A) :** Directions on the earth are entirely arbitrary.
Reason (R) : A spherical surface has no edge, beginning or end.
Codes:
A. Both A and R are correct and R is the correct explanation of A
B. Both A and R are correct but R is not the correct explanation of A
C. A is correct but R is false
D. A is false but R is correct

330. The magnetic declination on a map is shown by:
A. Seismic lines
B. Hypsometric lines
C. Plani metric lines
D. Isogonic lines

331. A dead ground is:
A. a barren land
B. ground not visible from two points
C. graveyard
D. fallow land

332. Which one of the following statement is correct with reference to the tidal hypothesis of the origin of the planets?
A. Planets were formed due to the aggregation of all the matter at nine knots of nine rings which were separated from the nebula
B. Planets were formed due to aggregation of all the matter of nine rings separately which were formed due to division of original ring separated from the nebula into nine rings
C. Planets were formed due to accretion of planetesimals
D. Planets were formed out of filaments

333. Flat topped sea mounts are known as:
A. Monodnocks B. Guyots
C. Inselberg D. Zeugen

334. Roche-Mountones (sheep Rocks) found in a glaciated region is:
A. terminal morraine
B. lateral morraine
C. depositional feature
D. erosional feature

335. Which of the following statement are correct regarding the Khadar soils? Select your answer from the code given below:
1. They occupy flood plains of the rivers
2. They are rich in plant nutrients
3. They have sizeable tracts of usar

Codes:
A. Only 1 is correct
B. Only 1 and 2 are correct
C. Only 1 and 3 are correct
D. All are correct

336. Which one of the following rivers of the world has the largest delta?
A. Yellow river
B. Nile
C. Mahanadi
D. Mississippi

337. In cold wet regions leaching helps in the formation of:
A. laterites B. podzoles
C. chernozens D. regur

338. The Ross ice-shelf is a part of:
A. S.Antarctica
B. Greenland
C. Iceland
D. Falk island

339. Radio active theory of the origin of the mountains is related with:
A. Jolly B. Holmes
C. Daly D. Kober

340. Which one of the following features is not associated with Karst topography?
A. Blind Valley B. Hanging Valley
C. Polines D. Lappies

341. Which of the following land forms develop from erosion on folded beds with exposed hard rocks?
A. Cuestas B. Butte
C. Mesa D. Hogbacks

342. What kind of land feature will result under the following circumstances – a mass of land is pushed up between the cracks in the earth's crust:
A. Block mountain
B. Fold mountain
C. Relict mountain
D. Volcanic mountain

343. Which of the following is not a soil type?
A. Pedalters B. Podzols
C. Chernozem D. Lemonites

344. **Assertion (A):** Hot deserts are situated on the western margin of the continents.
Reason (R): Rain bearing winds in horse latitudes change their direction according to season.
Select the correct answer from the code given below.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true and R is not the correct explanation of A
C. A is true, R is false
D. A is false, R is true

345. True shape of the earth is:
A. Ellipsoid B. Geoid
C. Spheroid D. None

346. The Richter scale of earthquake magnitude ranges between:
A. 0 to 6 B. 0 to 9
C. 0 to 12 D. 0 to 15

347. Which of the following mountain ranges is the youngest?
A. The Urals B. The Aravalli
C. The Applachian D. The Rockies

348. Match the following pairs of landforms and processes and find the correct answer from the code given below:

Land form	***Processes***
(a) Fold mountain	1. Fluvial deposition
(b) Natural levee	2. Earth movement
(c) Roche moutonee	3. Organic activity
(d) Coral reefs	4. Glacial Erosion

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	1	2	3	4
B.	4	3	2	1
C.	2	1	4	3
D.	3	2	1	4

349. Which of the following soils develops in coniferous forest areas of the world?
A. Chernozem B. Laterite
C. Pedocal D. Podzol

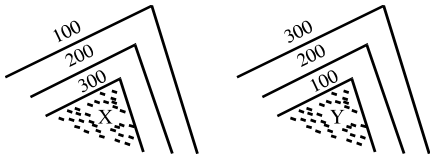
350. Which of the following causes acid rains?
A. Carbon dioxide
B. Chlorofluro carbon
C. Hydro carbon
D. Sulphur dioxide

351. The most productive biome is:
A. Equatorial
B. Savanna
C. Mediterranean
D. Prairie

352. In course of biotic succession in a lacustrine ecology, the population and diversity of flora-fauna:
A. decreases
B. increases
C. first decreases and then increases
D. neither decreases nor increases

353. Which one of the following is the largest desert in the world?
A. Gobi B. Kalahari
C. Arizona D. Sahara

354. Which one of the following statements about the locations of X and Y in the given contour maps is correct.



A. Both X and Y are located on spurs.
B. Both X and Y are located in valleys.
C. X is located on a spur while Y is located in valley.
D. X is located in a valley and Y is located on a spur.

355. The exponent of primarrumpf concept is:
A. Meyerhoff B. Penck
C. Davis D. Saver

356. Which of the following means mud flow on volcanic cones?
A. Lahar B. Gelifluction
C. Debris flow D. Debris slide

357. Which one of the following is related to modification in Devisian cyclic model?
A. Law of unequal slope
B. Law of allometric growth
C. equilibrium model
D. episodic erosion model

358. Which one of the following is dynamically induced?
A. Equatorial low pressure belt
B. Subtropical high pressure belt
C. Polar high pressure belt
D. None of these

359. The term peri-glacial was introduced by:
A. Lozinski B. Pe Terra
C. Peltier D. Money maker

360. Who amongst the following scholar first declared that the earth is spherical?
A. C. Ptolemy B. S. Munster
C. I. Kant D. P. Aplan

361. The percentage of energy transferred from one tropic level to another tropic level is known as:
A. Ecological niche
B. Ecological efficiency
C. Ecological pyramid
D. Ecological productivity

362. Which of the following is not included within the major objectives of the Biosphere Reserve programme of the UNESCO?
A. Conservation role
B. Development role
C. Logistic role
D. Regeneration role

363. Who amongst the following scientists first provided evidence of ozone depletion over the Antarctica?
A. M. Molina B. S. Rowland
C. J. Farman D. M.L. Parry

364. Consider the following statements:
Assertion (A): Conservation implies preservation and denial of use of natural resources.

Reason (R): It ensures a continuous supply of resources to man over longest possible period of time.
Select the correct answer using the code given below:
Codes:
A. Both A and R are true and R is the correct explanantion of A.
B. Both A and R are true but R is not the correct explanation of A.
C. A is true but R is false.
D. A is false but R is true.

365. Which one of the following statement is correct about la plata low lands?
A. Merging with the pampas in the south have been formed by deposition of alluvium
B. Merging with the pampas in the south have been formed by deposition of alluminium
C. Merging with the campos in the south have been formed by erosion
D. None of these

366. Study the following statements about the characteristics of Artesian basin and select the correct answer using the code given below Statements:
1. The name Artesian basin is derived from the region of Arto's in north east France.
2. The largest-Artesian basin is in Australia.
3. Artesian basins are not found outside Australia.
4. A well is Artesian if the water ascends under considerable pressure and flows at the surface without being pumped.

Codes:
A. 1 and 4 are correct.
B. 1 and 3 are correct.
C. 2 and 4 are correct.
D. 3 and 4 are correct

367. Which one of the following statements is not true for laterite soils?
A. They are formed due to in situ decay.
B. They are decomposed from basalts.
C. They are deficient in nitrogen.
D. They are rich in phosphate.

368. Soil leaching is a great threat in:
A. Tropical rainforest regions
B. Tropical savannas
C. Steppes
D. Taiga forest

369. Which of the following letters has been used by stamp in his land use survey of Britain for unproductive land?
A. B B. R
C. V D. W

370. Consider the following statements:
Assertion (A): Conservation is the new frontier.
Reason (R): The conservation movement originated in regions of dense population and advanced technologies.
Select the correct answer using the code given below.
Codes:
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

371. Which one of the following statements about an ecosystem is not correct?
A. It is a well structure functional unit.
B. The entire bioshpere is an ecosystem.
C. It has a spatial component.
D. It is a closed system.

372. Which of the followning drainage patterns is related to domed structure?
A. Annular B. Pendritic
C. Trellis D. Pinnate

373. The principle of uniformitarianism was propounded by:
A. Arthur Holmes B. Charles lyell
C. Marcus Reiner D. S.W. Carey

374. List of following land feature in Europe in descending order of their age:
1. Alps 2. North plains
3. Scandinavian Highlands 4. Spanish Mesata

Select the correct answer using the code given below:

Codes:

A. 4, 3, 1, 2 B. 3, 4, 1, 2
C. 3, 1, 4, 2 D. 1, 3, 4, 2

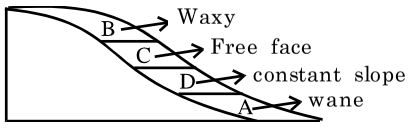
375. The division of the world into major natural regions was first made by:
A. Dudley stamp
B. Herbertson
C. Vidal dela Blache
D. Hettener

376. Loess deposits are found extensively in:
A. North China
B. North Africa
C. Western Australia
D. Patagonia

377. Which one of the following lakes is located in a rift valley?
A. Victoria B. Chad
C. Titicaca D. Baikal

378. Concept of palimpsest topography is related to:
A. Dynamic equilibrium model
B. Climatic geomorphology
C. Cyclic model
D. Episodic erosion model

379. Fig. depicts the typical model of a hill slope. Select the correct answer using the code given below:



1. A depicts waxing slope
2. B depicts waning slope
3. C depicts free face
4. D depicts constant slope

Codes:

A. 1 and 4 are correct
B. 1 and 3 are correct
C. 2 and 4 are correct
D. 3 and 4 are correct

380. **Assertion (A):** Tetrahedral theory well explains the present distribution of continents and ocean basins.
Reason (R): Cooling and contraction helped the earth to assume the form of tetrahedron.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true and R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

381. Which of the following plates along with the South American plate is responsible for the formation of the Andes mountains?
A. Caribean plate B. Cocosplate
C. Nazca plate D. Scotia plate

382. Which of the following area is occupied by the laurentian shield?
A. Northern Asia
B. Northern Canada and Greenland
C. South America
D. Southern Australia and New Zealand

383. Which of the following pair is not correctly matched?
A. Soil creep – convex slope
B. Frost action – rounded screes
C. Post-land slides – concave slope
D. Waterfall – plunge pool

384. Match List-I with List-II and select the correct answer using the code given below the lists.

List I Theories about the origin of the earth	***List II Distinctive***
(a) Gaseous hypothesis	1. Filament
(b) Hoyle & Lyttleton's theory	2. Solar Jets
(c) Planetesimal hypothesis	3. Steller explosion
(d) Tidal hypothesis	4. Rotating Nebula

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	2	4	3	1
B.	1	3	4	2
C.	4	3	2	1
D.	4	1	2	3

385. Who amongst the following propounded the concept of base level of erosion?
A. J.W. Powell B. G.K. Gilbert
C. W.M. Davis D. M. Morisawa

386. The polar front theory of the origin of temperate cyclones have been given by:
A. Lampert B. Bjerkenes
C. Trewartha D. Dana

387. Which one of the following concepts belongs to James Hutton?
A. Climatic geomorphology
B. Dynamic equilibrium
C. Cyclic nature of the earth's history
D. Geomorphic threshold

388. Select the correct chronological order of the following phases of pleistocene ice age using the code given below:
1. Wurm 2. Mindle
3. Gunj 4. Riss
Codes:
A. 1, 2, 3, 4 B. 2, 4, 3, 1
C. 1, 4, 2, 3 D. 4, 1, 2, 3

389. Study the following statements about the interior of the earth and select the correct answer from the code given below:
1. Temperature increases from the surface towards the earth's interiorate the average rate of 1°C for every 32 m.
2. The upper most layer of the earth is largely composed of silica and aluminium.
3. The earth's core has a density of 10 to 12.
4. Earthquake waves travel at a uniform speed in the earth's interior.
Codes:
A. 1 and 2 are correct.
B. 1, 2 and 3 are correct
C. 2, 3 and 4 are correct
D. 1, 2 and 4 are correct

390. **Assertion (A):** Maximum biodiversity is found in the equatorial biome.
Reason (R): Equatorial regions have very fertile zonal soils.
Select the correct answer from the code.
Codes:
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true and R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

391. Which one of the following processes of land formation is the most important in Arid lands?
A. Abrasion B. Corrosion
C. Deflation D. Ravination

392. Which one of the following temporal scales is related to mega geomorphology?
A. Graded time
B. Cyclic time
C. Steady time
D. Instant a neous time

393. Which one of the following is related to leopold Matrix?
A. Environmental impact assessment
B. Environmental stability
C. Environmental degradation
D. Network analysis

394. The higher temperature in the city centre is called as:
A. Heat dome B. Heat nigh
C. Heat trough D. Heat island

395. Which of the following is the correct definition of ecology?
A. Ecology is the study of man environment relationship
B. Ecology is the study of environmental management
C. Ecology is the science which studies interrelationship between abiotic and biotic components on one hand and among biotic components on the other hand
D. Ecology is the science which studies interrelationships between physical and biotic components

396. The layers of the earth's crust are distinguished by their:
A. thickness and depth
B. density and temperature
C. metallic content and rocks
D. all the above

397. Which one of the following is correct?
A. Ecosystem productivity is the rate of growth of organic matter per unit, time and area by autotrophs.
B. Ecosystem productivity is the rate of growth of organic matter per unit time and area by chemotrophs .
C. Ecosystem productivity is the rate of growth of organic matter per unit area by phototrophs.
D. Ecosystem productivity is the weight of living materials per unit area.

398. Which one of the following is not a correct statement?
A. Gross primary production is the total amount of energy produced by auto trophic primary producers at trophic level.
B. Net primary production is the amount of energy or organic matter fixed or stored at trophic level one.
C. The ecosystem productivity, whether gross or net is generally measured in gram/m^2/day or year.
D. Biomass refers to the wet weight of living matter per unit area per unit time in any ecosystem.

399. Which one of the following is not related to the Darwin's theory of origin of species?
A. Abrupt speciation
B. Adaptation
C. Natural selection
D. Survival of the fittest

400. **Assertion (A):** The relative loss of energy due to respiration increases with increasing trophic levels.
Reason (R): The animals have to move an work more for getting food with increasing trophic levels.
Codes:
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true and R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

401. Which one of the following is related to ozone formation?
A. Photsynthesis process
B. Photochemical process
C. Chemosynthesis process
D. Hydrolysis process

402. **Assertion (A):** Deforestation leads to accelerated rate of soil erosion.
Reason (R): Accelerated soil erosion causes floods in the rivers.
Codes:
A. Both A and R are true and R is correct explanation of A
B. Both A and R are true and R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

403. Which one of the following is not instrumental device to check air pollution?
A. Cinder block
B. Bag fiter
C. Wet scrubber
D. Cyclone separator

404. Which one of the following is not related to water pollution?
A. Eutrophication
B. Nitrofication
C. Biological oxygen demand
D. Oil slick

405. Which one of the following is a preglacial land form?
A. Drumlin B. Esker
C. Lappies D. Palsa

406. Match List I with List II and select the correct answer using the code given below the lists:

List I	***List II***
(a) Irrawadi	1. Bangkok
(b) Red	2. Hanoi
(c) Meenam	3. Yangoon
(d) Mekong	4. Vientienne

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	3	4	1	2
B.	3	2	1	4
C.	1	2	4	3
D.	2	3	1	4

407. Conservation of natural resources aims at one of the following:
A. Total ban on the use of resources for a short duration.
B. Partial restriction on their use.
C. Rational use of natural resources.
D. Profitable use of natural resources.

408. Match List I with List II and select the correct answer using the codes given below the lists:

List I	***List II***
Region	***Economic activity***
(a) Polar	1. Grazing
(b) Mountain	2. Agriculture
(c) Desert and semi desert	3. Lumbering
(d) Plains and river valleys	4. Whaling

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	1	2	3	4
B.	4	3	1	2
C.	2	3	4	1
D.	3	4	1	2

409. Study the following statements about organic farming and select the correct answer from the code:
1. It insists on exploiting the ecological processes for plant growth.
2. It advocates inter-culture.
3. It recommends higher inputs of chemical fertilizers.
4. It recommends integrated pest management.

Codes:
A. All the statements are correct
B. 1, 2 and 3 are correct
C. 2, 3 and 4 are correct
D. 1, 2 and 4 are correct

410. Which one of the following is exclusively related to control of ozone depletion?
A. Toronto summit
B. Rio Summit
C. Montreal protocol
D. Kyoto protocol

411. Ecosystem productivity means:
A. Quantity of living matter per unit time per unit area.
B. Net primary production of organic matter per unit area per unit time.
C. Production of biomass per unit area per unit time.
D. Rate of production of organic matter per unit area per unit time.

412. Which one of the following is a correct sequence of ideal hill slope profile of L.C. King?
A. Crest, pediment, scarp, debris slope
B. Scarp, crest, debris, slope
C. Pediment, crest, scarp, debris, slope
D. Crest, scarp, debris slope, pediment

413. Which one of the following topographic features is different from others on the basis of its mode of occurrence.
A. Dyke B. Lacolith
C. Sill D. Parasite cone

414. Air pressure is usually the highest when the air is:
A. cool and dry B. cool and moist
C. warm and dry D. warm and moist

415. According to Holmes convection currents in a geosyncline:
A. Diverge
B. Converge
C. Neither converge nor diverge
D. Both converge and diverge

416. Which one of the following landforms is not of polycyclic origin?
A. Cirque
B. Interlocking spurs
C. Valley-in-valley
D. Nickpoint

417. Study the following statements about the interior of the earth and select the correct answer from the code given below:
1. Temperature increases from the surface towards the earth interior at the average rate of 1°C for every 32 m
2. The outermost layer of the earth is largely composed of silica and aluminium

3. The core has a density of 10 to 12
4. Earthquake waves travel at a uniform speed

Codes:

A. 1 and 2 are correct.
B. 1, 2 and 3 are correct.
C. 2, 3 and 4 are correct.
D. 1, 3 and 4 are correct.

418. Match List I with List II and select the correct answer using the code given below the lists:

List I ***Concept***	***List II*** ***Proposer***
(a) Uniformitarianism	1. Powell
(b) Base-level	2. Hutton
(c) Continental drift	3. Hess
(d) Sea floor spreading	4. Wegner

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	1	2	4	3
B.	2	1	4	3
C.	4	3	2	1
D.	2	1	3	4

419. Which one of the following is a correct sequence of electromagnetic radiation from the sun from shortest wavelength to the longest wavelength?

A. Visible light rays, ultraviolet rays, radio waves, infrared rays.
B. Ultraviolet rays, infrared rays, radiowaves, visible light rays
C. Ultraviolet rays, visible light rays, infrared rays, radio waves
D. Infrared rays, visible light waves, radio waves, ultraviolet rays

420. Match List I with List II and select the correct answer using the code given below the lists:

List I	***List II***
(a) Instrusive igneous	1. Peat
(b) Extrusive igneous	2. Quartz
(c) Sedimentary	3. Dolerite
(d) Metamorphic	4. Basalt

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	3	4	1	2
B.	4	3	2	1
C.	3	1	4	2
D.	2	4	3	1

421. Which of the following is not a Lava plateau?

A. Armenia B. Columbia
C. Darkensberg D. Parana

422. Which of the following features is formed by the erosion of the concave banks of the river bends?

A. Incised meander
B. Interlocked spur
C. V-shaped valley
D. Rapid

423. Match List I with List II and select the correct answer using the code given below the lists:

List I	***List II***
(a) Belt of calm	1. G.G. Coriolis
(b) Deflective force	2. Doctor
(c) Roaring forties	3. Equatorial Westerlies
(d) Harmatton	4. Westerlies

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	4	2	3	1
B.	2	3	1	4
C.	3	1	4	2
D.	1	4	2	3

424. In which of the following areas of the world, the loess deposits have been formed by the accumulation of fine glacial dust carried away by out blowing winds?

A. Central Europe B. Pampas
C. Southern China D. Southern Australia

425. Match List I with List II and select the correct answer using the code given below the lists:

List I	***List II***
(a) C.H. Crickmay	1. Etch Plain
(b) L.C. King	2. Pene Plain
(c) M.F. Thomas	3. Pan Plain
(d) W.M. Davis	4. Pediplain

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	2	4	3	1
B.	3	4	1	2
C.	4	1	2	3
D.	1	3	2	4

426. Which of the following is not correctly matched?
A. Crag and tail : Glacier
B. Gassi : Desert
C. Plunge pool : River
D. Tombolo : Karst

427. Land form is a function of structure, process and time. This was stated by one of the following:
A. Walter Penck B. L.C. King
C. W.M. Davis D. Gilbert white

428. Which of the following two layers of the earth's interior are divided by Moho discontinuity?
A. Crust and core
B. Crust and mantle
C. Mantle and core
D. Inner and outer core

429. Study the following statements about the interior of the earth and select the correct answer from the code given below:
1. Temperature increases from the surface towards the earth's interior at the average rate of 1°C for every 32m.
2. The upper most layer of the earth is largely composed of silica and aluminium.
3. The earth's core has a density of 10 to 12.
4. Earthquake waves travel at a uniform speed in the earth's interior.

Codes:
A. 1 and 2 are correct.
B. 1, 2 and 3 are correct.
C. 2, 3 and 4 are correct.
D. 1, 2 and 4 are correct.

430. Study the following statements:
Assertion (A): Tetrahedral theory well explains the present distribution of continents and ocean basins.
Reason (R): Cooling and contraction helped the earth to assumes the form of a terahedron.
Select the correct answer using the code given below.
Codes:
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

431. Which one of the following mineral is not associated with sedimentary rocks?
A. Mica B. Coal
C. Petroleum D. Hematite

432. Who of the following propounded the concept of base level of erosion?
A. J.W. Powell B. G.K. Gilbert
C. W.M. Davis D. M. Morisawa

433. Which one of the following pairs is correctly matched?
A. Folded structure – Inversion of relief
B. Domed structure – Strike vales
C. Uniclinal structure – Antecedent stream
D. Horizontal structure – Anticlinal valley

434. Which one of the following belongs to pencks model of slope development:
A. Graded waste sheet
B. Slope replacement
C. Pediplanation
D. Hill slope cycle

435. Which one of the following is not an example of polycyclic relief?
A. Incised meander
B. Nick point
C. Uplifted peneplain
D. Pediplain

436. The polar front theory of the origin of temperate cyclone has been given by:
A. Lampert B. Bjerknes
C. Tre wartha D. Dana

437. Which one of the following is a low cloud?
A. Stratus B. Cirrus
C. Cumulus D. Cirro stratus

438. Which one of the following is not an evidence in support of continental drift?
A. Topographic fit of continents
B. Palaeo magnetism
C. Plate tectonics
D. Vulcanicity

439. The world famous Grand Canyon has developed in the:
A. Colorado B. Potaro
C. Mississippi D. St. Lawrence

440. Select the correct chronological order of the following phases of pleistocene Ice age, using the code given below:
1. Wurm 2. Mindel
3. Gunj 4. Riss
Codes:
A. 1, 2, 3, 4 B. 2, 3, 4, 1
C. 1, 4, 2, 3 D. 3, 4, 1, 2

441. Match List I with List II and select the correct answer using the code given below the lists:

List I	***List II***
(a) Panna	1. Finest White Marble
(b) Makrana	2. Diamond
(c) Junjhunu	3. Cement Industry
(d) Lakheri	4. Copper

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	4	1	2	3
B.	2	1	4	3
C.	1	2	3	4
D.	3	2	4	1

442. Who first proposed that mountains have deep roots?
A. Airy B. Pratt
C. Hayford D. Joly

443. Which one of the following areas is occupied by the Laurentian shield?
A. Northern Asia
B. Northern Canada
C. South America
D. Western Australia

444. Which one of the following causes ozone-depletion?
A. Chlorine B. Fluorine
C. Carbon D. Methane

445. Which of the following statements is true about sedimentary rocks?
A. They are rocks whose structure is contingent on heat and pressure.
B. The rocks are crystalline.
C. The rocks have been deposited in Layers.
D. The rocks can not be formed under water.

446. The tydal hypothesis of the origin of Earth was given by:
A. Laplace and Jeffreys
B. Jeans and Roche
C. Jeans and Jeffreys
D. Jeans only

447. The Gaseous mass theory of the origin of Earth was given by:
A. Laplace B. Lockyer
C. Roche D. E. Kant

448. The Binary star Hypothesis was propounded by
A. Russel and Littleton
B. Littleton and Laplace
C. Littleton and Roche
D. None of these

449. The origin of a rift valley can be teraced to:
A. Forces of tension in the valley.
B. The over deepening of a valley by ice action.
C. Forces of tension in the Earth's crust.
D. None of these

450. The Meteor Hypothesis of the origin of Earth was given by:
A. E. Kant B. Lockyer
C. Laplace D. Jeffreys

451. Laplace gave:
A. The Nebular theory of the origin of Earth
B. The Meteor Hypothesis of the origin of Earth
C. The Gaseous Mass Theory of the origin of Earth
D. None of these

452. Match the following:

List I	***List II***
(a) Cenozoic	1. 70 million years
(b) Mesozoic	2. 200 million years
(c) Palaeozoic	3. 450 million years
(d) Pre Cambrian	4. About 5 billion years

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	1	2	3	4
B.	2	3	4	1
C.	1	2	4	3
D.	2	1	3	4

453. The Deccan Lava Region was formed during.
A. Triassic period
B. Jurassic period
C. Cretaceous period
D. None of these

454. Find out the correct sequence of the Eras.
A. Pre-cambrian, mesozoic, palaeozoic, cenozoic
B. Palaeozoic, cenozoic, pre-cambrian, mesozoic
C. Palaeozoic, pre-cambrian, cenozoic, mesozoic
D. Pre-cambrian, palaeozoic, mesozoic, cenozoic

455. In palaeozoic Era some movements occurred findout the correct sequence:
A. Caledonian, Armonican, Taconian, varicon
B. Taconian, Caledonian, Armonican, varicon
C. Varicon, caledonian, Armonican, Taconian
D. Taconian, Armonican, Caledonian, varicon

ANSWER

1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
C	B	D	A	C	A	D		A	B
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
A	D	A	B	C	B	B	A	C	C
21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
C	C	C	C	A	D	A	A	C	B
31	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
D	C	A	D	A	A	B	D	C	C
41	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**
A	A	D	A	D	C	B	A	B	C
51	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
C	B	A	D	D	D	B	C	C	B
61	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**
B	A	A	A	A	A	B	A	A	C
71	**72**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**
D	A	A	D	C	C	B	B	A	B
81	**82**	**83**	**84**	**85**	**86**	**87**	**88**	**89**	**90**
C	A	A	A	A	B	B	C	B	D
91	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**100**
C	B	C	A	A	B	B	A	C	B

101	**102**	**103**	**104**	**105**	**106**	**107**	**108**	**109**	**110**
D	A	B	B	C	C	A	A	D	A
111	**112**	**113**	**114**	**115**	**116**	**117**	**118**	**119**	**120**
A	C	A	C	D	A	A	C	D	B
121	**122**	**123**	**124**	**125**	**126**	**127**	**128**	**129**	**130**
D	A	D	D	A	C	A	C	B	A
131	**132**	**133**	**134**	**135**	**136**	**137**	**138**	**139**	**140**
A	C	D	C	C	A	C	A	C	A
141	**142**	**143**	**144**	**145**	**146**	**147**	**148**	**149**	**150**
D	A	A	A	A	B	D	B	C	D
151	**152**	**153**	**154**	**155**	**156**	**157**	**158**	**159**	**160**
A	C	D	B	C	A	A	B	B	C
161	**162**	**163**	**164**	**165**	**166**	**167**	**168**	**169**	**170**
C	D	A	A	C	C	A	C	A	A
171	**172**	**173**	**174**	**175**	**176**	**177**	**178**	**179**	**180**
A	C	C	C	A	C	A	B	B	D
181	**182**	**183**	**184**	**185**	**186**	**187**	**188**	**189**	**190**
A	C	A	B	A	B	B	C	B	C
191	**192**	**193**	**194**	**195**	**196**	**197**	**198**	**199**	**200**
B	A	A	C	A	B	B	A	C	C
201	**202**	**203**	**204**	**205**	**206**	**207**	**208**	**209**	**210**
D	A	C	A	A	D	A	C	B	A
211	**212**	**213**	**214**	**215**	**216**	**217**	**218**	**219**	**220**
D	C	A	A	C	B	C	A	C	C
221	**222**	**223**	**224**	**225**	**226**	**227**	**228**	**229**	**230**
A	D	B	A	C	D	C	A	D	B
231	**232**	**233**	**234**	**235**	**236**	**237**	**238**	**239**	**240**
C	B	D	A	C	B	A	A	C	D
241	**242**	**243**	**244**	**245**	**246**	**247**	**248**	**249**	**250**
B	A	C	C	A	B	A	A	C	D
251	**252**	**253**	**254**	**255**	**256**	**257**	**258**	**259**	**260**
A	D	A	A	C	A	A	B	B	C
261	**262**	**263**	**264**	**265**	**266**	**267**	**268**	**269**	**270**
C	C	A	B	D	A	D	C	A	B
271	**272**	**273**	**274**	**275**	**276**	**277**	**278**	**279**	**280**
A	D	B	A	C	D	C	C	D	A
281	**282**	**283**	**284**	**285**	**286**	**287**	**288**	**289**	**290**
C	A	A	A	A	B	C	D	B	D
291	**292**	**293**	**294**	**295**	**296**	**297**	**298**	**299**	**300**
B	B	A	C	B	A	A	C	A	A
301	**302**	**303**	**304**	**305**	**306**	**307**	**308**	**309**	**310**
A	D	D	B	C	C	C	C	B	B
311	**312**	**313**	**314**	**315**	**316**	**317**	**318**	**319**	**320**
B	C	D	B	B	A	D	A	C	B
321	**322**	**323**	**324**	**325**	**326**	**327**	**328**	**329**	**330**
D	B	A	A	A	C	C	C	A	D
331	**332**	**333**	**334**	**335**	**336**	**337**	**338**	**339**	**340**
B	D	B	D	B	B	B	A	A	B

341	**342**	**343**	**344**	**345**	**346**	**347**	**348**	**349**	**350**
A	A	D	B	B	B	D	C	D	D
351	**352**	**353**	**354**	**355**	**356**	**357**	**358**	**359**	**360**
A	B	D	C	B	A	D	B	A	A
361	**362**	**363**	**364**	**365**	**366**	**367**	**368**	**369**	**370**
D	C	C	D	A	A	D	A	D	A
371	**372**	**373**	**374**	**375**	**376**	**377**	**378**	**379**	**380**
D	A	B	B	B	A	A	C	D	A
381	**382**	**383**	**384**	**385**	**386**	**387**	**388**	**389**	**390**
C	B	B	C	A	B	C	C	B	C
391	**392**	**393**	**394**	**395**	**396**	**397**	**398**	**399**	**400**
C	B	A	D	C	D	A	D	A	A
401	**402**	**403**	**404**	**405**	**406**	**407**	**408**	**409**	**410**
B	B	D	B	D	B	C	B	D	C
411	**412**	**413**	**414**	**415**	**416**	**417**	**418**	**419**	**420**
B	D	D	B	B	A	B	B	C	A
421	**422**	**423**	**424**	**425**	**426**	**427**	**428**	**429**	**430**
A	B	C	A	B	D	C	B	B	A
431	**432**	**433**	**434**	**435**	**436**	**437**	**438**	**439**	**440**
D	A	A	B	D	B	C	D	A	C
441	**442**	**443**	**444**	**445**	**446**	**447**	**448**	**449**	**450**
B	A	B	A	C	C	D	A	C	B
451	**452**	**453**	**454**	**455**					
A	A	C	D	B					

3 Climatology

1. Because of which one of the following factors, clouds do **not** precipitate in descents?
A. Low pressure
B. Low humidity
C. High wind velocity
D. High temperature

2. Which of the following statements characterize convectional rainfall?
A. It occurs daily in the equatorial regions
B. It is of very short duration
C. It occurs through cumulo-nimbus clouds

Select the correct answer using the code given below:
A. 1, 2 and 3 B. 1 and 3 only
C. 2 and 3 only D. 1 only

3. The Tornadoes are very strong tropical cyclones originating in:
A. Carribean sea B. China sea
C. Arbian sea D. Black sea

4. Match list-I with list-II and select the correct answer using the code given below the lists:

List-I (Country)	*List-II (Local wind)*
(a) Australia	1. Hurricane
(b) China	2. Willy-Willy
(c) France	3. Typhoon
(d) West Indies	4. Mistral

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	2	3	4	1
B.	1	2	3	4
C.	1	3	2	4
D.	4	1	2	3

5. Which of the following statements is not true about doldrum?
A. It is found across all longitudes.
B. It is located astride the equator.
C. It is a zone of feeble westerly winds.
D. It is a high pressure belt.

6. Which of the following does not contribute to the origin of ocean-currents?
A. Rotation of the earth
B. Differences in density of ocean water
C. Wind direction
D. Difference in temperature

7. Consider the following statements:
Assertion (A): The thickness of the troposphere is the greatest at the equator.
Reason (R): Near the equator insolation is high and convection currents are strong.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

8. Study the following statements regarding summer solstice and select the correct answer from the code given below:
1. The sun is on the cancer
2. The sun is on the capricorn
3. The day is longest and night is shortest in the Nothern Hemisphere.
4. The day is longest and night is shortest in the Southern Hemisphere.

Codes:
A. 1 and 2 are correct
B. 2 and 4 are correct
C. 1 and 3 are correct
D. 2 and 3 are correct

9. Consider the following statements:
Assertion (A): Isotherms do not run parallel to each other.

Reason (R): The variation of temperature in any area is not orderly. Select the correct answer from the code below.

Codes:

A. A is true R is false
B. Both A and R are false
C. R is true A is false
D. Both A and R are true

10. Dry warm summers are found in:
A. China Sea
B. Mediterranean Sea
C. Red Sea
D. Arabain Sea

11. Hot dry winds blowing in Sahara are known as:
A. Fohn B. Chinook
C. Mistral D. Sirocco

12. In which part of India is found a Amw type climate as per Koeppen's classification?
A. S.W. Coast B. N. W. Coast
C. N. E Coast D. S. E. Coast

13. Chinook winds descend on the eastern slopes of rocky mountains their temperature is raised according to:
A. Normal lapse rate
B. Dry adiabatic rate
C. Wet adiabatic rate
D. Both the normal lapse rate and dry adiabatic rate

14. The ratio between actual humidity of air and its maximum moisture holding capacity at a given temperature is termed as:
A. Absolute humidity
B. Relative humidity
C. Specific humidity
D. Dew Point

15. A planet's farthest points in its orbit from the sun is known as:
A. Apogee B. Perigee
C. Aphelion D. Perihelion

16. Which of the following order of the structure of the atmopshere is correct?
A. Stratosphere, troposphere, thermosphere, mesosphere.
B. Troposphere, stratosphere, mesosphere, thermosphere.
C. Troposphere, mesosphere, ozonosphere, ionosphere.
D. Troposphere, thermosphere, mesosphere, exosphere.

17. In Koppen's climatic classification 'AS' stands for which region of India?
A. Western desert
B. Tamil Nadu coast
C. Kerala coast
D. Eastern Himalayas

18. The movement of I.C.C largely governs the rainfall pattern in:
A. Equatorial climate.
B. Mediterranean climate.
C. Monsoon climate.
D. Western maritime climate.

19. A majority of arboreal fauna, few grazing lands, carnivorous animals and abundant aquatic life are characteristic of:
A. Wet-dry tropics
B. Rainy tropics.
C. Monsoon lands
D. Tropical desert

20. Match List I with List II and select the correct answer using the code given below the lists:

List I	***List II***
(a) Chinook	1. U.S.A.
(b) Sirocco	2. Australia
(c) Brickfielder	3. Europe
(d) Mistral	4. Africa

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	1	4	2	3
B.	2	3	4	1
C.	3	2	1	4
D.	4	1	3	2

21. Consider the following statements:
Assertion (A): The mediterranean region receives rainfall during winter.
Reason (R): It lies between the westerlies and the trade winds.

Select the correct answer from the code given below.

Codes:

A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

22. Study the following statements:
Assertion (A): The coastal North America receives rainfall through out the year.
Reason (R): It is influenced by onshore winds for most of the year
Select the correct answer from the code given below.

Codes:

A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

23. Which one of the following winds flows across the Alps mountain?
A. Dust Devils B. Zonda
C. Fohn D. Santa Ana

24. Which climate is represented by the following data?

	Jan.	April	July	Oct.
AV. Max. Temp. °C	8.0	13.5	24.4	17.2
AV. Rainfall mm	8.6	5.0	1.0	11.0

A. China type
B. Mediterranean type
C. Monsoon type
D. Sudan type

25. Central chile of south America is an example of:
A. Equatorial Region.
B. Mediterranean Region.
C. Savanna Region.
D. Taiga Region.

26. Koppens 'CS' pry summer subtropical climate is found in:
A. Mediterranean deserts.
B. Mid Latitude deserts.
C. Mid Latitude coniferous forest
D. Sub tropical deserts.

27. In which of the following climate regions rainfall is affected due to southern oscilations:
A. Sudan type
B. Monsoon type
C. N. W. European type
D. Equatorial type

28. Westerlies blow all the year round..... rainfall maximum in winters.....sometimes snowfall as well as ports are never frozen, frosts may occur on cold nights, distinct seasons, comfortable climate. Which of the following regions do these characteristics apply to:
A. Western Europe.
B. South-East Asia.
C. North Latin America.
D. South-East Australia

29. The category of sources which meets the largest requirement of commercial energy in the world at present is:
A. Solar energy, geothermal and wind power
B. Dung and vegetation waste
C. Fossil fuel
D. Hydro power

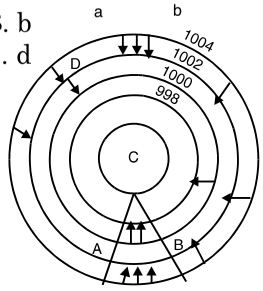
30. Which of the following winds blows down the leeward slope of the northern Alps in Switzerland?
A. Fohn B. Sirocco
C. Mistral D. Chinook

31. In which of the following natural regions dairy industry is best developed?
A. Monsoon Region
B. N.E. Prairie Region
C. Mediterranean Region
D. Savanna Region

32. Which one of the following is not a factor in occasioning summer monsson precipitation in India?
A. North Atlantic oscillation
B. Southern oscillation
C. I.T.C
D. Jet stream

33. Who of the following have divided India into climatic regions based on range of temperature and amount of rainfall?
A. Koppen
B. Stamp and Kendrew
C. Trewartha
D. Thornth waite

34. In the diagram the warm front lies at:
A. a B. b
C. c D. d



35. Consider the following statements:
Assertion (A): There is no atmosphere on moon.
Reason (R): Only one part of moon can be seen from the earth
Select the correct answer from the code given below.
Codes:
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not correct explanation of A
C. A is true but R is false
D. A is false but R is true

36. 'Halo' around the sun or moon are produced due to:
A. refraction of light by ice crystals.
B. refraction of light by water droplets.
C. diffraction of light by ice crystals.
D. diffraction of light by water crystals.

37. Which of the following pairs is correctly matched?
A. Monsson Region.....Heavy rainfall throughout the year.
B. Mediterranean Region.....summer rain.
C. Desert Region.....winter rain.
D. Equatorial Region.....Afternoon thunder showers.

38. Which one of the following notations has been used by G.T. Trewartha for the climate of Ganga plain?
A. CA'w B. Caw
C. CB'w D. Cwg

39. Relative humidity of the atmopshere is measured by:
A. hydrometer B. hygrometer
C. lactometer D. clinometer

40. The ozone layer lies in:
A. Ionosphere B. Photosphere
C. Stratosphere D. Troposphere

41. **Assertion (A):** The Atmosphere receives most of the heat from the earth's surface.
Reason (R): The conversion from short wave solar energy to long wave terrestrial energy takes place at the earth's surface:
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

42. In which atmospheric layer are observed, two contrasting trends of temperature. (increase followed by decrease with height).
A. Troposphere B. Mesosphere
C. Ionosphere D. Stratosphere

43. Which one of the following persons has used evapotranspiration for the classification of the world climate?
A. Koppen B. Trewartha
C. Thorn waite D. Kendrew

44. The weather map of India does not show.
A. cloudiness B. wind direction
C. Isobars D. Isotherms

45. Study the following statements:
Assertion (A): There is a close correlation between moisture supply and forests.
Reason (R): Most of the wet regions of the world are tree covered.
A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

46. Winter rains in Uttar Pradesh are associated with:
A. Retreating monsoons
B. Thunder storms
C. Temperate cyclones
D. Local convection

47. The most colourful evening clouds are:
A. cumulus. B. stratus.
C. cirrus. D. nimbus.

48. For the year as a whole the anomalies: are negative over the continents from
A. about 30° latitude towards the pole
B. about 40° latitude towards the pole
C. about 50° latitude towards the pole
D. about 60° latitude towards the pole

49. Which one of the following climatic symbols has been used by C. W. Thornthwaite to denote the climate of the Southern Ganga Plain.
A. AA'r B. BA'w
C. CA'w D. CB'w

50. Which one of the following is a correct sequence of electromagnetic radiation from the sun from the shortest wave length to the longest wavelength?
A. Visible light-rays, ultraviolet rays, radiowaves, infrared rays.
B. Ultraviolet rays, visible light-rays, infrared rays, radiowaves.
C. Ultraviolet rays, infrared rays, radio waves, visible light.
D. Infrared rays, visible light-rays, radio waves, ultraviolet rays.

51. Who of the following introduced the idea of precipitation evaporation ratio in climatic classification?
A. Koppen B. Thornwaite
C. Critchfield D. Strahler

52. The layer of the atmosphere which contains water vapour and dust particles is called?
A. Stratosphere B. Troposphere
C. Ionosphere D. Mesosphere

53. The relatively moderate climate of the British isles is explained by:
A. Labrador current
B. Kuro-siwo
C. Gulf stream
D. North Atlantic drift.

54. EL-Nino flows along the coast of:
A. Brazil
B. Peru
C. Alaska
D. Western Australia

55. The hot and dry local winds which blow in the Saharan region are known as:
A. Fohn B. Chinook
C. Mistral D. Sirocco

56. Which type of rainfall does take place in the coastal areas of West Bengal and Orissa in April-May?
A. Orographic B. Cyclone
C. Convectional D. Frontal

57. Mistral is:
A. Benign wind.
B. Beneficial to the orchard keepers.
C. A very cold and dry wind with high velocity.
D. Channeled through the Rhine valley

58. Chinook blows:
A. down the east slopes of the Rockies.
B. down the west slope of the Andese.
C. down the east slope of the Andese.
D. down the west slope of Rockies.

59. Chinook is a:
A. devastating wind.
B. hot and dry wind.
C. cold and dry wind.
D. all of the above.

60. Fohn is located in:
A. The Alps B. The Atlas
C. The Andes D. The Rockies

61. The areas affected by loo comprise of:
A. Pakistan.
B. Afghanistan.
C. Plains of Northern India.
D. All of the above.

62. Local winds develop:
A. as a result of local differences in pressure.

B. in the lowest levels of the troposphere.
C. all of the above
D. None of these

63. The valley breeze blows:
A. along the slope B. at night.
C. during day time D. A and C

64. The land breeze blows:
A. at night
B. during day
C. during both day and night.
D. None of the above.

65. Which of the South Asian countries does not get rains from monsoon?
A. Bhutan
B. Pakistan
C. Bangladesh
D. Burma

66. Among the current theories of origin of the monsoon, the widely accepted theory is given by:
A. Fohn B. Coriolis
C. Haggard D. None of these

67. Monsoons are the:
A. periodic winds.
B. best examples of large scale modification of the planetary wind systems
C. both A and B.
D. none of these.

68. Land and sea breeze are example of:
A. parochial winds. B. local winds.
C. periodic winds. D. None of these.

69. The westerlies are the best developed between:
A. 20° and 45° North
B. 45° and 70° South.
C. 40° and 65° South
D. 30° and 45° South.

70. The trade winds in the northern and southern hemisphere are known as:
A. North eastern and South eastern trades respectively.
B. North western and south western trades respectively.
C. North Western and south western trades respectively.
D. North Eastern trades and south western trade respectively.

71. The trade winds due to coriolis force are deflected:
A. to the right in the Northern Hemisphere
B. to the right in the Southern Hemisphere and to the left in the Northern Hemisphere
C. to the right in the Southern Hemisphere
D. none of the above

72. The trade winds are:
A. prevailing winds
B. planetary winds
C. periodic winds
D. both A and B

73. The westerly winds are the:
A. planetary winds B. trade winds
C. prevailing winds D. both A and B

74. The direction and speed of wind are controlled by:
A. the pressure gradient force
B. gravity
C. the coriolis effect
D. all of the above

75. The vertical or nearly vertical movement of air referred to as:
A. wind B. air current
C. planetary winds D. global winds

76. The horizontal movement of the air is called:
A. wind.
B. air current
C. both A and B
D. None of the above

77. Formation of sub-tropical high pressure belts are caused by:
A. Thermal mechanism
B. Dynamic control
C. Subsidence of cooled air
D. Both B and C

78. Horse Latitudes are:
A. belt of calm conditions
B. characterised by variable and feeble wind
C. high pressure belt
D. all of the above

79. Lowest temperatures are found:
A. over the tropics
B. over the poles
C. over the equator
D. None of the above

80. On the earth's surface. There are in all—pressure belts.
A. 5 B. 6
C. 7 D. 8

81. The density of air depends upon:
A. temperature B. amount of water
C. gravity D. All of the above

82. Distribution of atmospheric pressure is not uniform over the earth's surface. It varies.
A. vertically B. horizontally
C. both A and B D. none of these

83. For the year as a whole the anomalies are positive towards:
A. the tropic
B. the equator
C. the poles
D. none of these

84. The smallest anomalies of temperature occur in the:
A. Southern Hemisphere
B. Northern Hemisphere
C. Eastern Hemisphere
D. Both B and C

85. The atmosphere is heated:
A. more by terrestrial radiation
B. more by incoming solar radiation
C. less by terrestrial radiation
D. none of these

86. The reflected amount of radiation is called:
A. the heat balance of the earth
B. the albedo of the earth
C. the heat budget of the earth
D. both A and C

87. Winds and ocean currents are produced:
A. due to radiation
B. due to imbalance of heat
C. due to temperature
D. due to earth's movement

88. The atmosphere is heated:
A. mainly from above
B. mainly from below
C. mainly from space
D. none of these

89. Distribution of temperature over the earth:
A. is uniform
B. is not uniform
C. varies horizontally as well as vertically
D. both B and C

90. Conduction is important only in the:
A. upper layer of the atmosphere
B. lower layer of the atmosphere
C. middle layer of the atmosphere
D. both A and B

91. In all latitudes below 40°:
A. more solar radiation is received than is lost of space by the earth
B. lesser solar radiation is received than is lost of space
C. gain and loss in equal
D. none of these

92. Heat budget is:
A. the balance of incoming and out going radiation
B. the account of only incoming radiation
C. the account of incoming and out going radiation
D. none of these

93. Temperature contrasts between the continents and the oceans are:
A. greater during winter than summer
B. minimum during rainy season
C. greater during summer than during winter
D. none of these

94. In many valleys, settlements and cultivation are concentrated:
A. on the western slopes
B. on the eastern slopes
C. on the southern slopes
D. on the northern slopes

95. For most places on the earth.....represent the seasonal extremes of temperature.
A. December and July
B. December and June
C. January and August
D. January and July

96. A wid-spacing of the isotherms indicates:
A. a slow change in temperature
B. a rapid change in pressure
C. a rapid change in temperature
D. a slow change in pressure

97. The largest anomalies of temperature occur in the:
A. Northern Hemisphere
B. Southern Hemisphere
C. Oceans
D. Land

98. Isotherm generally end east-west because of:
A. same latitude B. easy passage
C. same longitude D. none of these

99. Isotherm shift north and south from season to season this is due to:
A. position of sun with respect to earth
B. earth's movement
C. position of earth with respect to sun.
D. none of these

100. In summers and winters isotherms swerve much north or south over:
A. Asian landmass B. Atlantic Ocean
C. Australia D. Indian Ocean

101. The most important layer for all biological activity in the atmospher is:
A. Mesosphere B. Ionosphere
C. Exosphere D. Troposphere

102. Occasional winter rainfal in northern India occurs due to the cyclones from:
A. Bay of Bengal
B. Pacific Ocean
C. Arabian Sea
D. Mediterranean Sea

103. The climate of which of the following natural regions is most affected by the shifting pressure belts:
A. Mediterranean
B. Equatorial
C. Western maritime
D. Prarie.

ANSWER

1	2	3	4	5	6	7	8	9	10
B	A	A	A	D	D	A	C	D	B
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
D	A	B	B	C	B	B	C	B	A
21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
B	A	C	B	B	A	B	A	C	A
31	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
B	A	B	B	B	A	D	B	B	C
41	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**
A	D	D	D	B	C	C	B	C	B
51	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
B	B	D	B	D	C	C	D	B	A
61	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**
A	C	D	A	A	A	C	C	C	A
71	**72**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**
A	D	D	D	B	A	D	D	B	C
81	**82**	**83**	**84**	**85**	**86**	**87**	**88**	**89**	**90**
D	C	B	A	A	B	B	B	D	B
91	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**100**
A	A	A	C	D	A	A	A	A	A
101	**102**	**103**							
D	D	A							

4 Oceanography

1. Sunda Trench lies in:
   A. Atlantic Ocean B. Pacific Ocean
   C. Indian Ocean D. Antarctic Ocean
2. Which one of the fallowing is correct?
   A. Along Brazilian coast
   B. Off south west African coast
   C. Off Spanish and North African coast
   D. Along West coast of united states
3. **Kiel Canal** connects:
   A. Baltic sea and North sea
   B. Red Ocean and Mediterranean sea
   C. Caribbean sea and Pacific sea
   D. Atlantic Ocean and Pacific Ocean
4. Falkland Islands are in:
   A. Antarctica B. North Atlantic
   C. South Atlantic D. Pacific
5. The main masses of land above sea level are called:
   A. Continent B. Islands
   C. Nations D. Countries
6. **Assertion (A):** Despite low evaporation and stable stratification of the atmosphere, salinity is high in polar regions.
   Reason (R): Sea water freezes leaving the remaining water saline than before.
   Codes:
   A. Both A and R are true and R is the correct explanation of A
   B. Both A and R are true but R is not the correct explanation of A
   C. A is true but R is false
   D. A is false but R is true
7. The cause for the Tsunami, as deduced by the seismologists, is:
   A. Gravitational pull of the moon
   B. Low pressure through in the ocean
   C. Deformation of sea floor and vertical displacement of water
   D. Sudden change in the monsoon wind
8. Which of the following factors affect the origin and movement of current:
   I. Gravitational Force
   II. Atmospheric pressure and insolation
   III. Salinity and density of water
   IV. Direction and Shape of coast
   A. I and II B. I, II and IV
   C. I, II and III D. All four
9. Grand Banks is one of the important producers of:
   A. nitrate B. iron ore
   C. marine fish D. bauxite
10. Which one of the following statements is correct?
    A. Salinity decreases with increasing evaporation
    B. There is inverse relationship between precipitation and salinity
    C. There is inverse relationship between atmospheric pressure and salinity
    D. Salinity increases with influx of river water in oceans
11. Name the ocean in which the north equatorial current changes its direction with season:
    A. North Pacific Ocean
    B. Atlantic Ocean
    C. Indian Ocean
    D. South Pacific Ocean
12. Which of the following theory explains the origin of coral reefs and atolls?
    A. Sliding continental theory
    B. Elastic rebound theory
    C. Continental drift theory
    D. Glacial control theory

13. Which one of the following is not a cold current?
A. Falkland B. California
C. West Australia D. Agulhas

14. Which one of the following trench is not located in the Pacific Ocean?
A. Mariana B. Tonga
C. Sunda D. Aleutian

15. Which one of the following is a warm current?
A. Peruvian current
B. Canaries current
C. Benguela current
D. Brazil current

16. Which one of the following does not enjoy mediterranean type of climate?
A. California B. Cyprus
C. Bolivia D. Algeria

17. Of the following west European countries the only one with coast lines on three seas is:
A. Portugal B. Belgium
C. Spain D. France

18. Which of the following theories of the formation of coral reefs and atoll was postulated by Darwin?
A. Glacial control theory
B. Subsidence theory
C. gland still theory
D. composite theory

19. The density of sea water increases if:
A. depth and concentration of salt both decrease
B. depth and concentration of salt both increase.
C. depth decreases but concentration of salt increases.
D. depth increases but concentration of salt decreases.

20. Stationary wave theory is related to the origin of:
A. tides
B. the earth
C. continents
D. coral reefs

21. Which of the following is not a warm current?
A. N.E. monsoon current
B. California current
C. Agul has current
D. East Australian current

22. The important ocean resource for iodine and potash is:
A. Green algae
B. Red algae
C. Brown algae
D. Blue green algae

23. Identify the correct sequence of the amount of the following minerals present in ocean water in descending order using the code given below:
Minerals
1. Magnesium chloride
2. Sodium chloride
3. Magnesium sulphate
4. Calcium sulphate

Codes:

A.	1	2	3	4
B.	2	3	1	4
C.	4	1	2	3
D.	2	1	3	4

24. **Assertion (A):** Pisciculture has shown phenomenal growth in monsoon Asia
Reason (R): Monsoon Asia countries are the leading exporters of fish
Select the answer from the following code:
Codes:
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

25. On the basis of international trade, the most important ocean route is:
A. Atlantic Ocean, Mediterranean Sea, Indian ocean via Suej Canal.
B. Atlantic ocean, Indian Ocean via cape of Good Hope.
C. North Atlantic route between Europe and North America.
D. Western coast of North America-Europe route via Panama Canal.

26. **Assertion (A):** Mid Oceanic ridges are the nuclei of future continents.
Reason (R): There has been divergent movement of plates along mid-oceanic ridges.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

27. Which of the following is not correctly matched?
A. Aleutian trench — North Pacific
B. Tonga trench — South Pacific
C. Puerto Rico trench — South Atlantic
D. Sunda trench — Indian Ocean

28. Which of the following pairs are correctly matched?
1. Oyeshio : South Pacific
2. Falkland Current : South Atlantic
3. Mozambique Current : Indian Ocean
4. Labrador current : North Pacific

Codes:
A. 1 and 2 B. 2 and 3
C. 3 and 4 D. 1 and 4

29. Which of the following pair of factors is responsible for a lag of 58 minutes in two direct tides on the earth's Ocean surface?
1. Earth's rotation
2. Earth's revolution
3. Moon's rotation
4. Moon's revolution

Codes:
A. 1 and 2 B. 2 and 3
C. 3 and 4 D. 1 and 4

30. Study the following statements about the mid-oceanic ridges and select the correct answer using the code given below:
1. Mid oceanic ridges are zones of linear.
2. These are given to up welling of lava.
3. Convection currents converge under the mid oceanic ridges.
4. Sea floor spreading starts from this zone.

Codes:
A. 1 and 2 are correct
B. 2, 3 and 4 are correct
C. 1, 2 and 4 are correct
D. 1, 3 and 4 are correct

31. The only European country with coastlines on the Atlantic ocean, mediterranean sea and North Sea is:
A. Portugal B. Belgium
C. Spain D. France

32. Which of the following occur more frequently than
A. Hurricanes B. Willy willies
C. Tornado D. Typhoons

33. A long wall built on the beach that crosses shoreline at right angles for the protection of the shoreline against erosion is termed as:
A. Sea wall B. Groyne
C. Dockyard D. Harbour

34. The shallow waters of the continental shelves are rich grounds. An example of such area is:
A. Black Sea B. Caspian Sea
C. Bass Strait D. North Sea

35. Along the coasts salinity is:
A. lowered B. increased
C. stable D. unaffected

36. OTEC power plants can be only located in:
A. Temperate region
B. Subtropical zone
C. Tropical region
D. Polar zone

37. The desalination plant in India is located at:
A. Kavarati B. Chennai
C. Minicoy D. Diu

38. The most common method of desalination in the world is:
A. Flash distillation
B. Electrodialysis
C. Reverse osmosis
D. Heating

39. The up rush of the tidal waves of certain height through the river mouth is called:
A. Seiches B. Tsunamis
C. Spring tide D. Tidal bore

40. High sea tides occur after an interval of:
A. 14 days
B. 12 hours 26 minutes
C. 6 hours and 2 minutes
D. 4 hours and 6 minutes

41. Equatorial spring tides occur at an interval of:
A. 12 and a half hours
B. 6 hours
C. 6 months
D. 12 months

42. Which one of the following ocean currents is popularly known as warm planet of Europe?
A. Gulf stream
B. Agul has currents
C. East Australian current
D. Falkland current

43. Spring tides occur on full moon and new moon days because:
A. moon and earth at right angle
B. sun and moon are at right angles
C. sun, earth and moon are in a straight line
D. sun and earth are at right angle

44. Neap tides are smaller because:
A. the moon's gravitational force is less
B. the sun and the moon do not act together.
C. the gravitational attraction of sun and moon tend to cancel each other.
D. it takes place at night.

45. A tidal period is:
A. 12 hour duration period during which high tide and low tide come
B. duration between the high and the low tide
C. 12 hour 26 minutes period between successive high and low tide
D. duration between two successive crests

46. The periodic appearance of warm water off the peruvian coast due to the suppression of trade winds is called:
A. Humboldt current
B. Cromwall current
C. Under toe
D. None of these

47. Sinking of oceanic water is caused by its increased density. At which of the following latitudes will sinking occur:
A. 0° B. 40°
C. 60° D. 90°

48. In the lower latitude warm currents blow on:
A. the western shore
B. the eastern shore
C. both A and B
D. none of these

49. Match the following:

Currents	***Oceans***
(a) Falkland current	1. warm current
(b) Norwegian current	2. cold current
(c) Florida current	3. West coast of the U.S.A.
(d) Okhotsk current	4. Atlantic Ocean
(e) British columbia current	5. West Coast of Kamachatka Peninsula.

Codes:

	(a)	*(b)*	*(c)*	*(d)*	*(e)*
A.	2	4	1	5	3
B.	2	1	4	5	3
C.	1	2	3	4	5
D.	4	2	5	3	1

50. Cobot current is the branch of:
A. labrador current
B. N. equatorial current
C. Bengula current
D. Brazilian current

51. The Gulf Stream is:
A. Found in the Pacific Ocean
B. Found on the western side of the Atlantic Ocean
C. Found near cape of Good Hope
D. Found in the Arctic Ocean

52. The Sargasso Sea is an area of:
A. sea weeds
B. warm saline water
C. calm conditions
D. very cold waters

53. The.....current is produced by upwelling of cool water off the coast of Chile and Peru:
A. Gulf stream
B. Humboldt current
C. Benguela current
D. None of these

54. What is the principal cause of surface circulation in the oceans?
A. Wind action
B. Temperature
C. Coriolis effect
D. Density differences

55. The Okhotsk current washes the shores of:
A. Alaska
B. Kamchatka peninsula
C. Yellow Sea
D. Hokkaido island

56. Sargasso sea is located in the:
A. Indian Ocean
B. Gulf of Mexico
C. North Atlantic Ocean
D. South Pacific Ocean

57. Which of the following is a cold ocean current?
A. Humboldt current
B. Canaries current
C. Falkland current
D. All of these

58. The sub surface movement between east and west Atlantic takes place through:
A. Romance trench
B. Walvi & ridge
C. Guinea trench
D. Wyllie Thompson ridge

59. Caballing refers to:
A. movement of water along the slope
B. sinking and merging of surface water
C. current movement off shore
D. upwelling and divergence of water

60. The counter equatorial current flows from
A. west to east
B. east to west
C. north to south
D. south to north

61. Surface currents in the ocean are primarily caused by
A. temperature difference
B. density difference
C. wind action
D. coriolis effect

62. An eastward flowing sub surface counter current in the pacific is:
A. Leeuwin current
B. Abrorhas current
C. Cromwell current
D. equatorial current

63. The circulation clockwise flow of water is called a:
A. geostrophic current
B. up welling
C. gyre
D. water masses

64. Corals are generally found in tropical sea between:
A. 20°N and 15°S
B. 30°N and 30°S
C. 10°N and 10°S
D. 23.5°N and 23.5°S

65. Which of the following is considered as a marine paradise?
A. Atoll
B. Great barrier reef
C. Lagoon
D. Fringing reef

66. The coral reefs are mainly found in:
A. polar regions
B. tropical regions
C. mid latitude regions
D. equatorial regions

67. The Great Barrier reef is found:
A. close to Greenland
B. in Persian Gulf
C. in the Bay of Bengal
D. off the Australian N.E. Coast

68. The Second Largest Barrier reef after the Great Barrier reef in the world is:
A. Off the coast of Belite between Mexico and Guatemala
B. Off the west coast of India
C. Off the Sahara Coast
D. Off the east coast of Seychelles

69. Which of the following conditions are not helpful to the growth of corals?
A. Clear shallow water
B. Sediment free water
C. Photic Zone
D. Salinity around

70. The maximum development of coral reef formation takes place in:
A. Pacific Ocean B. Arabian Sea
C. Caribbean Sea D. South Atlantic

71. The only eastern coast of ocean where true sclerectinian corals are found is:
A. Coast of West Australia
B. South East Pacific
C. North East Pacific
D. Somalian Coast

72. The reef building corals are called:
A. hermatypic
B. a hermatypic
C. sclerectinian type
D. sessile type

73. Lime stone deposits are the most important deposits of:
A. Deep Sea B. Shallow Sea
C. Deep Sea Plain D. Coastal area

`74. The main components of green mud are:
A. $CaCO_3$ and $FeCO_3$
B. $FeCO_3$ and $PbCO_3$
C. Glauconite and $CaCO_3$
D. $Ca(OH)_2$ and Glauconite

75. Which of the following is correctly matched?
A. Red clay —Pacific Ocean
B. Pelagic deposits —Only inorganic
C. Pteropod Ooze —Continental
D. Terrigenous deposits—Deep Sea plain

76. Which ocean deposits is found in the deepest parts of the ocean?
A. Red clay
B. Terrigenous deposits
C. Diatom ooze
D. Red mud

77. .....deposits occupies the largest percentage of bottom surface of oceans.
A. Terrigenous B. Biogenous
C. Clay D. Hydrogenous

78. Red clay is chiefly composed of:
A. clay minerals derived from wind borne dust
B. rock waste dropped by iceberg
C. wind blown volcanic ash
D. All of the above

79. The most widespread pelagic deposits are:
A. red clay B. radiolaria
C. diatom D. pteropod

80. The most wide spread ooze deposits are:
A. globigerina B. pteropod
C. cocolithophore D. Radiolaria

81. In which of the following locations evaporate deposits form?
A. Dead Sea B. Gulf of Mexico
C. Lake Superior D. L Tanganyika

82. Black beds form under the conditions of:
A. stagnant water
B. greater organic matter content
C. presence of little oxygen
D. All of the above

83. Surface salinity of sea water predominantly depends upon the ratio of evaporation to precipitation at which of the following latitude surface salinity will be the highest.
A. 0° B. 20°
C. 30° D. 40°

84. Normal salinity of sea water defined as the amount of salt per thousand grams of sea water, which of the following is true for it.
A. 25 gms B. 30 gms
C. 35 gms D. 40 gms

85. What is the most common salt in the sea water?
A. Sodium chloride
B. Calcium chloride
C. Calcium carbonate
D. Magnesium sulphate

86. What is the average salinity between 15°S- 20°S latitude?
A. 32 percent B. 30 per cent
C. 25 per cent D. 35 per cent

87. The average salinity of sea water is:
A. 40 per cent B. 35 per cent
C. 30 per cent D. 20 per cent

88. Which one of the following seas/oceans has the maximum salinity?
A. North Sea
B. Pacific Ocean
C. Atlantic Ocean
D. Indian Ocean

89. In.....latitudes, salinity.....with depth.
A. High, increases
B. Low, increases
C. High, decreases
D. Low, decreases

90. In open ocean in the sub tropical high pressure zone the salinity is.....while in the enclosed seas in the same latitude, salinity is.....
A. Higher, lower
B. Lower, higher
C. Higher, constant
D. Constant, higher

91. Bays and headlines are generally found in shore line of:
A. submergence
B. emergence
C. neutral type
D. faulted type

92. A narrow coastal inlet is known as:
A. creek B. cre vasse
C. ria D. fiord

93. How are the bottom topography of an ocean shown?
A. Hypsographic curve
B. Countour maps
C. Hydrostatic curve
D. Hythergraph

94. The Red Sea is an example of:
A. residual structure
B. volcanic structure
C. folded structure
D. faulted structure

95. Guyots were discovered by:
A. Guyot, A.D.
B. Guyot A.H.
C. Guyot W.A.
D. Guyot C.S.

96. Wyville Thompson ridge is located in:
A. north Atlantic Ocean
B. Indian Ocean
C. north Pacific Ocean
D. south Pacific Ocean

97. Archipelago is:
A. the shallow part of the sea
B. the slowly moving mass of ice down a mountian
C. the ring shaped coral reefs
D. a group of islands

98. The ninety-East ridge is found in:
A. Indian Ocean
B. Atlantic Ocean
C. Andes mountain
D. Rocky mountain

99. Which of the following seas is located on the continental shelf?
A. Tasman Sea
B. North Sea
C. Caribbean Sea
D. Caspian Sea

100. Which line joins points of the seas/oceans having equal salinity?
A. Thermohaline
B. Isohaline
C. Isobars
D. Isotherms

101. In deep seas oozes are formed due to the deposition of:
A. inorganic materials
B. volcanic materials
C. terrigenous materials
D. organic materials

102. Sargasso sea is located in:
A. Atlantic ocean B. Indian Ocean
C. Pacific Ocean D. Arctic Ocean

103. Salt is available at sambhar because:
A. exposure of rock salt
B. a lake with no drainage outlet
C. a lake which receives sea water
D. it has a closed lagoon

104. Shrimp culture is highly developed in:
A. Andhra coastal region
B. Gujarat coastal region
C. Kerala coastal region
D. Orissa coastal region

105. Largest fresh water storage of the world lies in:
A. Greenland. B. Antarctica.
C. Himalayas. D. Alps.

106. Dolphin-challenger Ridge is located in:
A. Atlantic Ocean B. Pacific Ocean
C. Arctic Ocean D. Indian Ocean

107. Which of the following is a cold ocean current?
A. Venguela B. Gulf Stream
C. Kurisio D. Peru

ANSWER

1	2	3	4	5	6	7	8	9	10
C	B	A	C	B	D	B	D	C	B
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
C	D	D	C	D	C	D	B	B	A
21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
B	C	D	C	C	B	C	B	D	C
31	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
D	A	B	D	A	C	A	C	D	B
41	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**
D	A	C	C	C	D	D	B	A	A
51	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
B	A	B	A	B	C	D	A	B	A
61	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**
C	C	C	B	B	B	D	A	D	A
71	**72**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**
A	A	B	C	A	A	B	D	A	A
81	**82**	**83**	**84**	**85**	**86**	**87**	**88**	**89**	**90**
A	D	D	C	A	A	B	C	A	B
91	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**100**
B	D	A	D	B	A	D	A	B	B
101	**102**	**103**	**104**	**105**	**106**	**107**			
D	A	B	C	B	A	A			

5 Geographical Thought

1. Who used the method of ranking coefficient for the first time in India in order to calculate agricultural productivity?
   A. Prof. Mohammed shafi
   B. Prof. Jasbir Singh
   C. Prof. M.G. Kendall
   D. Prof. Dudley Stamp
2. Which of the following pairs is correct?
   A. Alfred Wegener - Plate Tectonics
   B. Archdeacon Pratt - Continental Drift Theory
   C. William Moris Davis - Geographical Cycle of Erosion
   D. Walter penck - Theory of Isostasy
3. Which one of the following pairs is correct?
   A. Concentric zone Theory - E.W. Burgess
   B. Sector Theory - Alfred Weber
   C. Multi-Nuclei Theory - Homer Hoyt
   D. Fused Growth Theory - Griffith Taylor
4. The concept of Gnomon was given by:
   A. Greeks B. Homes
   C. Anaximander D. Thales
5. The modified conical projection for the first time was used by:
   A. Ptolemy
   B. Kant
   C. Aristotle
   D. None of the above
6. Who is know as "Father of geography"?
   A. Thales B. Hipparchus
   C. Hecataeus D. Herodotus
7. Geographia was written by:
   A. Hipparchus B. Eratosthenes
   C. Polybius D. Posidonius
8. Ges-Periodos are the work of:
   A. Hipparchus B. Hecatqeus
   C. Herodotus D. Ptolemy
9. The world geography was used for the first time by:
   A. Eratosthenes B. Kant
   C. Aristotle D. Thucydides
10. The first systematic description of world is found in:
    A. Ges-periodos
    B. Climata
    C. Outline of Geography
    D. None of the above
11. Thales and Anaximander are generally recognised as:
    A. The founders of cultural geography
    B. The founders of regional geography
    C. The founders of mathematical geography
    D. The founders of historical geography
12. For the first time the world landmass was divided into three continents i.e., Europe, Asia and Libya by:
    A. Hecataeus B. Herodotus
    C. Eratosthenes D. Thales
13. On the basis of latitudes who divided the world into 'climate' (belt of latitudes)?
    A. Eratosthenes B. Strabo
    C. Hipparcus D. Ptolemy
14. Who was the first geographer to divide the circles into 360°, based on Assyrian arithmetic?
    A. Herodotus B. Anaxi mander
    C. Hipparcus D. Hecataeus
15. The "Astrolabe" turned out to be an important instrument, which made possible the measurement of latitude at sea by observing the angle of the polar-star, was invented by:
    A. Hipparcus B. Hecataeus
    C. Anaximander D. Herodotus

16. Which among the following is not a Greek geographer?
A. Anaxi mander B. Strabo
C. Thales D. Hecataeus

17. Which of the following is a Roman geographer?
A. Hipparcus B. Thales
C. Ptolemy D. Hecataeus

18. The credit of conversion of a three dimensional sphare into two dimensional plane goes to:
A. Hipparcus B. Ptolemy
C. Strabo D. None of these

19. The author of the Alamagast is:
A. Strabo B. Hipparcus
C. Ptolemy D. None of these

20. The 'Almagast' of ptolemy mainly deals with:
A. Regional geography
B. Complicated problems of latitudes and longitudes
C. History
D. Complicated problems of mathematical geography and astronomy.

21. The "Outline of geography" is a contribution of:
A. Ptolemy B. Strabo
C. Kant D. Verenius

22. The Greek geographer who contributed to the development of mathematical Geography was:
A. Anaxi mander B. Thales
C. Eratosthenes D. Unknown

23. According to Thales, a Greek philosopher, the shape of the earth was:
A. oval
B. spherical
C. flat
D. circular

24. The favourite branch of Greek geographers was:
A. Astronomy and political
B. Astronomy and physical
C. Astronomy and cultural
D. Physical and political

25. One of the earliest to prove that the earth is spherical were:
A. Romans B. Arabs
C. Greeks D. Indians

26. The most important physical geographers among the Greek geographers was:
A. Possidonius B. Polybius
C. Aristotle D. Anaximander

27. The pupil of Aristotle ____ studies the relationship between the plants and climate.
A. Thales B. Theophrastus
C. Herodotus D. Anaximander

28. The book which was authored by Strabo was:
A. Geographia generalis
B. Phytogeography
C. Historia naturalis
D. Geographia

29. The area of interest of Strabo was:
A. Human geography
B. Historical geography
C. Mathematical geography
D. Cartography

30. Who is said to have laid the foundation of regional geography?
A. Hecataeus of miletus
B. Polybius
C. Eratosthenes
D. Strabo

31. Match the following:

(a) De chorographia	1. Pomponius Mela
(b) Geographia Syntaxis	2. Ptolemy
(c) Father of Oceanography	3. Pliny
	4. Possidonius

Codes:

	(a)	*(b)*	*(c)*
A.	3	4	2
B.	1	2	4
C.	1	2	3
D.	1	3	4

32. The content of Geographic syntaxis is:
A. Study of cosmological and physical environment
B. Tables of latitudes, longitudes and projections.
C. Interrelations of physical environment
D. Mathematical calculation of planet earth

33. Which of the following statements is True?
A. Humboldt founded the Berlin geographical society.
B. Humboldt and Ritter differed mainly on the concept of 'whole'.
C. Humboldt and Ritter had identical view on the concept of whole
D. Both used inductive method.

34. Humboldt's monumental book "Cosmos" was published in:
A. 1840 B. 1845
C. 1835 D. 1850

35. The world 'climatology' was first used in the:
A. 4th International geographical congress in the 1889
B. 5th International geographical congress in 1904
C. 6th International geographical congress in 1919
D. None of these

36. Humboldt is considered as the founder of:
A. Modern geography
B. Plant geography
C. Climatology
D. All of these

37. In cosmos:
A. A comparative study of similar forms and regions on the surface of earth was done.
B. Humboldt had laid foundation of a systematic regional descriptions.
C. A and B
D. None of these

38. Proceeding from the central city von Thunen's theory of agricultural location visualises production of fuelwood in:
A. First ring B. Second ring
C. Third ring D. Fourth ring

39. Which of the following statement is true about "Humboldt and his concept of whole"?
A. He was seeking to understand the fact about the elements making up the whole.
B. Humboldt was philosopher brooding over the whole.
C. He and Ritter had identical view over whole.
D. None of the above

40. Who among the following is not a German Geographer?
A. Roxby B. Alfred Hettner
C. Richthofen D. Albrencht Penk

41. Who among the following is not a German geographer?
A. Ratzel B. Humboldt
C. Oscar Paschel D. Herbertson

42. Who said "sapce is not a thing or event. It is a kind of framework for things and events: something like a system of pigeon holes or a filing system for observation".
A. Humboldt
B. Ritter
C. Immanual Kant
D. Verenius

43. The founder of concept of "Dualism" in geography was:
A. Verenius B. Kant
C. Ritter D. Hettner

44. The first map that shows America as a seperate continent was drawn by:
A. Martin Waldseemuller in 1567
B. Martin Waldseemullar in 1507
C. Nicholus Copernicus in 1507
D. Nicholus Copernicus in 1567

45. The "Heliocentric concept" of the universe was estbalished by:
A. Nicholus Copernicus
B. Kant
C. Verenius
D. Humboldt

46. The "Heliocentric concept" of the universe means:
A. Sun revolves round the earth.
B. Universe is geocentric
C. All the planets rotate around the sun.
D. None of the above

47. The founder of "space-time concept" was:
A. Verenius
B. Nicholus Copernicus
C. Immanuel Kant
D. None of these

48. The first "Globe" of the world was made in the:
A. 14th century B. 15th century
C. 16th century D. 17th century

49. New projections like mercator was invented in:
A. 1669 B. 1620
C. 1469 D. 1569

50. The first institute of geography at Sargres near Cape St. Vincent was established by:
A. Marco polo
B. Christophor Columbus
C. Prince Henary
D. B and C

51. Ibn Khaldun work "Muqaddimah" deals with the:
A. Description and discussion of human society in its various aspects.
B. Climate zones of the world.
C. Case studies of a particular estate.
D. Regional geography of the world.

52. Who wrote, "Amusements for Him who desires to travel around"?
A. Al-Biruni B. Al Idrisi
C. Al Masudi D. Al-Maqdisi

53. Kitab-ul-Hind was written by:
A. Al Maqdisi B. Al Masudi
C. Al Biruni D. None of these

54. "Kitabul-Ashkal" is:
A. the first historical account of the Arab world
B. description and discussion of human society
C. the first climatic atlas of the world
D. none of the above

55. "A book of routes and Realms" was written by:
A. Ibn Khaldun B. Al Masudi
C. Al Maqdisi D. Ibn Hawqul

56. 'Baitul Hikma':
A. A book written by Al Masudi
B. was an academy established by caliph Harun-al-Rashid
C. is a memoir written by Al-Maqdisi
D. is a book written by caliph Harun-al-Rashid

57. 'Kitabul-Ashkal' is authored by:
A. Al Masudi B. Al Maqdisi
C. Al Balakhi D. Ibn Hawqal

58. The first climatic Atlas of the world was compiled by:
A. The Arabs B. The Romans
C. The French D. The American

59. In 1985 AD. Al-Maqdisi offered a new division of the world into:
A. 14 climatic regions
B. 16 climatic regions
C. 18 climatic regions
D. 20 climatic regions

60. Who were the first to give the idea of the periodic nature of the monsoons?
A. The French B. The Arabs
C. The Greeks D. The Romans

61. The "Muqaddimah" was Authored by:
A. Ibn-Hawqal B. Al-Idrisi
C. Ibn-Khaldum D. Ibn-Maqdisi

62. During the puranic period, which part of the world was not known to them?
A. Americas B. Europe
C. S.E. Asia D. Africa

63. In Ramayana Valmiki has interpreted six seasons, sisira corresponds to:
A. Magh-Phaguna (Jan-Feb)
B. Chaitra-Vaisakha (March-April)
C. Asvina-Kartika (Sep-Oct)
D. Sravan-Bhado (July-Aug)

64. In puranas "Meru" means.
A. Southpole B. Northpole
C. Latitude D. Longitude

65. Strabo considered earth as:
A. an oblong B. floating disc
C. circular plane D. None of these

66. Who for the first time plotted Bay of Bengal as the "Gangetic Gulf"?
A. Hipparcus
B. Ptolemy
C. Strabo
D. Verenius

67. Which of the following statements is not true?
A. Indian philosophy and Indian writers were specially studied by the Arab geographers
B. Arabian map making was more advanced than the Greek
C. The Arabian geographers especially studied the human habitation
D. Map making was helped by the correct measurement of latitude and longitude

68. One of the main contribution of Arab geographers was:
A. they made important contribution to the development of Astronomy
B. they wrote books on geographical description
C. they preserved old geographical knowledge
D. All of these

69. Location School in geography is represented by:
A. R. Peet B. E. William
C. P. Hagget D. C. Saver

70. Name the Arab scholar who described the monsoons and the relation of evaporation to rainfall.
A. Al-Idrisi
B. Al-Maqdisi
C. Ibn-Hawkal
D. Al-Biruni
E. Al-Masudi

71. One of the following Arabian geographers visited India during the period of Mohammed Tughlaq and served as a Kazi:
A. Al-Battani B. Ibn-Yunus
C. Al-Maqdisi D. Ibn-Batuta

72. Which among the following Arabian geographer provided a good description of house types and building materials in desert?
A. Jackout B. Al-Masudi
C. Ibn-Yunus D. Ibn-Batuta

73. ____ was the greatest Arab traveller.
A. Ibn-Hawkal B. Ibn-Batuta
C. Ibn-Yunus D. Ibn-Khaldun

74. ____ was the most learned man of his age.
A. Al-Biruni B. Al-Aizaz
C. Al-Idrisi D. Ibn-Hawkal

75. The Arab were mainly interested in _____ geographer:
A. Political B. Systematic
C. Historical D. Mathematical

76. Which Arabian geographer can be called as political geographer?
A. Al-Idrisi B. Ibn-Khaldun
C. Al-Biruni D. Ibn-Yunus

77. The first Arabian geographer to give an account of the periodic wind was:
A. Al-Idrisi B. Al-Masudi
C. Ibn-Yunus D. Ibn-Hawkal

78. How was the world map represented in the dark period?
A. The world was represented as T in O with Jerusalem at the centre
B. Only Jerusalem was shown on the map
C. It was a flat disc
D. All of these

79. Just like Eratosthenes, an Arab geographer calculated the earth circumference. He was:
A. Al-Kalim B. Al-Kalam
C. Abu Zaid D. Ibn Khaldun

80. From 300 to 1200 AD, the dark age, there was the influence of:
A. Zorostrians B. Jews
C. Christianity D. Islam

81. The period from 300 AD to 1200 AD is known as Dark age because:
A. Roman Empire had declined
B. Geography texts were affected by Christian holy test
C. All the texts of geography were burnt during this period
D. There was no exploration work

82. The dark age was from:
A. 300 AD to 1200 AD
B. 300 ADto 900 AD
C. 1700 AD t 2100 AD
D. 300 BC to 400 AD

83. The first geographer to introduce the concept of Gnomon to the Greeks was:
A. Eratosthenes B. Anaximander
C. Aristotle D. Steers

84. Who was the first in the world to suggest use of a grid of latitude and longitude as a basic for locating places on the world?
A. Hipparchus B. Aristotle
C. Eratomines D. Thales

85. Although containing 14% error but still the most accurate calculation of circumference was made by:
A. Steers B. Eratosthenes
C. Ptolemy D. Amundesen

86. The view point that the physical environment offers human being arrange of opportunities from which they are able to select is called:
A. Environmentalism
B. Scientific Determinism
C. Stop and go determinism
D. None of the above

87. Who is called as the father of Anthropology?
A. Theophratus
B. Pliny
C. Pomponius Mela
D. Ptolemy

88. Geography must serve the cause of human welfare. This standpoint is represented by the:
A. Ecological School
B. Locational School
C. Traditional School
D. Radical School

89. Identify the following geographer:
1. He wrote the book Almagest.
2. He discovered steoreographic projection.
3. He modified conical projection.
A. Strabo B. Ptolemy
C. Hipparchus D. Pliny

90. Which of the following is also known as the age of exploration and discoveries:
A. 1200 to 1600 AD B. 1200 to 1700 AD
C. 1100 to 1200 AD D. 1200 to 1300 BC

91. Which French explorer during louis IX took jounrney towards Soviet Russia Central Asia and Mangolia?
A. De Martonne
B. William Rubereek
C. Clauverius
D. Per Pillow

92. Almost all the Portuguese sailors began their journey towards.
A. South and Southwest
B. West
C. East
D. North and North East.

93. In 1510, the Portuguese explorer _____ reached india.
A. Al Burgugue
B. Vasco-da Gama
C. Captain Hawkins
D. Christopher Columbus

94. John Cabot sailed up to:
A. South Georgia
B. Tierra del Feugo
C. Cap Race in New foundland
D. Plate river mouth

95. The author of "Geography – A modern synthesis".
A. A Schulz B. P. Haggett
C. D.M. Smith D. E.A. Ackerman

96. The subject matter of geographia Gereralis comprised of Absolute part, Relative part and comparative part match the parts and their contents.

(a) Absolute part	1. Surface description of Earth
(b) Relative part	2. Relationship of Earth with stars
(c) Comparative part	3. Form and size of the Earth

Codes:

	(a)	*(b)*	*(c)*
A.	3	2	1
B.	1	2	3
C.	2	2	3
D.	2	3	1

97. Which one of the following travellers did not pass through the cape of Good Hope?

A. Columbus B. Cook
C. Magellan D. Vasco-da-Gama

98. Match the following:

(a) Richard Hokluyt	1. Principal Navigation
(b) Giles Fletcher	2. Description of Soviet Union
(c) Carpenter	3. World geography

Codes:

	(a)	*(b)*	*(c)*
A.	1	2	3
B.	2	3	1
C.	3	2	1
D.	2	1	3

99. Who for the first time took journey to the whole world?

A. Magellan B. Marcopolo
C. Columbus D. Bespuki

100. Vasco da Gama reached India through:

A. Suez Canal
B. Gulf of Slam
C. Cape Horn
D. None of these

101. Match the following places and persons who discovered them.

(a) Cape of Good Hope	1. Christopher Columbus
(b) America	2. Amerigo Vespucci
(c) Brazil	3. Vasco-da-Gama
(d) Greenland	4. Hendry Bludson

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	3	1	2	4
B.	1	2	3	4
C.	2	1	3	4
D.	4	3	2	1

102. Who among the following do not belong to heliocentric group?

A. Aristotle B. Galileo
C. Copernicus D. Varenius

103. The political statistical school is represented by:

A. Varenius
B. Vidal dela Blache
C. Buschiny
D. None of the above

104. The use of natural boundaries rather than political boundaries for the description of regional geography came to be known as:

A. Practical geography
B. Systematic geo
C. Reine Geography
D. None of the above

105. Practical and scientific methods were developed for the first time by:

A. Minshul
B. Ratzel
C. Forrester Brothers
D. None of the above

106. Raine geography was:

A. description of mountain axes
B. description of natural regions of the earth than political regions
C. description of heavenly bodies
D. description of Astronomical events

107. The first description of natural regions are found in the works of:

A. Getterer B. Buache
C. Busching D. Hommeyer

108. Which of the following geographers do not belong to the Reine geography school?
A. Forster
B. Hommeyer
C. Buache
D. Zeune

109. Who accompanied "captain cook on his voyage" to southern Hemisphere?
A. Humboldt B. Holt
C. Immanuel Kant D. Forsters

110. The German geographer who developed practical and scientific methods of geography was:
A. Cluverius B. Forsters
C. Kant D. Holt

111. Which one of the following countries is the Landschaft school associated:
A. Britain
B. France
C. Germany
D. United States of America

112. The cosmos was authored by:
A. Ritter B. Ratzel
C. Humboldt D. Hettner

113. "Similar locations lead to similar mode of life" was said by:
A. Ellen Semple B. Ratzel
C. Kant D. Hettner

114. The behavioural approach to human geography was introduced by:
A. Allen Philbrick B. Peter Haggett
C. William Kirk D. Brian Berry

115. The organic theory of state and society was propounded by:
A. Ritter B. Ratzel
C. Hettner D. Houshofer

116. Lands chafts kunde (Landscape science) concept was given by:
A. Hettner B. Ritter
C. Penck D. Ratzel

117. The idea of 'topographical maps' was put forward by:
A. Thunen B. Penck
C. Davis D. Ritter

118. The Arid landform theory was postulated by:
A. Daly B. Davis
C. Penck D. None of these

119. Match the following geographers and their associated universities.

(a) Varenius	1. Koningsberg university
(b) Humboldt	2. Gottingen university
(c) Ritter	3. Berlin university
(d) Ratzel	4. Heildelberg university

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	4	3	2	1
B.	1	2	3	4
C.	3	2	1	4
D.	2	1	4	3

120. Who said that Geography is the science of spatial distribution of the world?
A. Humboldt B. Ritter
C. Ratzel D. Paschel

121. Who said "geographical diversity is the basis of Historical Diversity"?
A. Fabre B. Ratzel
C. Ritter D. Varenius

122. What approach the following statements gives, "The dissected coast line of Europe is not accidental rather it has been made by God with a specific purpose".
A. Causal B. Teleological
C. Peterministic D. Fatalistic

123. Who is the person who belongs to the idea of environmental Determinism?
A. Aristotle B. Ratzel
C. Humboldt D. All of these

124. Match the following:

(a) Alexander von Humboldt	1. Unity of nature
(b) Carl Ritter	2. Anthropocentric view point
(c) Oscar Paschel	3. Lander kunde
(d) Forebel	4. Vergleichend

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	1	2	3	4
B.	2	3	1	4
C.	3	4	1	2
D.	1	2	4	3

125. Who amongst the following scholars is not associated with the theory of geosyncline?
A. Dana B. Haug
C. Jeffreys D. Kober

126. Which one of the following is not the difference in the view points of Humboldt and Ritter?
A. Humboldt applied inductive method Ritter deductive.
B. Humboldt was a field geographer, Ritter armchair geographer
C. Humboldt studies phenomenon systematically Ritter from regional viewpoint
D. Humboldt believed inherent causality, Ritter took an anthropocentric attitude

127. Oscar Paschel's writing gave birth to geomorphology in a similar way—writing gave birth to human geography.
A. Ratzel B. Ritter
C. Humboldt D. Fabre

128. Who said "Earth is an organism made in its minutest details to feet the needs of man to perfection?"
A. Spencer B. Bluntschilli
C. Hobber D. Ritter

129. Who said similar locations lead to similar made of life?
A. Fleure B. Humboldt
C. Ratzel D. Semple

130. Who compared state to an organism?
A. Haushofer B. Ratzel
C. Kjellen D. Mckinder

131. "Man is a product of earth's surface". This statement was given by:
A. Montesque B. Anuchin
C. Semple D. Huntington

132. Who observed that achievements in civilisation are bound by a particular type of climate?
A. Davis B. Huntington
C. R Mill D. Chisolm

133. Match the following:

(a)	Influence of Geographic Environment	1.	G. Taylor
(b)	Pulse of Asia	2.	Huntington
(c)	Geography in the 20th Century	3.	E.C. Semple
(d)	Environment, Race and Migration	4.	F. Ratzel

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	3	2	4	1
B.	3	4	1	2
C.	3	2	1	4
D.	4	3	2	1

134. Determinism is the most indispensable facet of Dialectical thought this statement was given by:
A. H. Baranasky B. G. Plakhonov
C. V. Anuchin D. K. Wittofegal

135. Who compared environment to a traffic police?
A. Teitham B. Herbertson
C. Taylor D. Chisholam

136. Which concept (or ism) best-explains the man and nature relationship?
A. Determinism B. Possibilism
C. Probabilism D. All of these

137. Who among the following was not the follower of Deterministic view?
A. Bunrches B. Ratzel
C. Semple D. Hipparchus

138. Philosophy of living space advocates:
A. Everyone has the right to occupy any part of space.
B. Everyone in the world has the right to exist
C. Sovereign limit of the state.
D. Superior people have the right to expand their territory at the expense of the inferior people.

139. Which of the following statement about Ritter is untrue?
A. He organised the concept of relationship in space
B. He completely rejected the concept of Reine geography
C. He adopted Anthropocentric approach
D. He adopted teleological view
E. None of these

140. Which of the following statement about Ritter is not true?
A. He was an armchair geographer
B. He was an teleologist
C. He wrote regional monographs
D. His approach was deductive

141. The early geographers believed in the philosophy of:
A. Nomadism
B. Possibilism
C. Neodeterminism
D. Determinism

142. The concept of Climatic energy was propounded by:
A. Huntington B. Davis
C. Kant D. Humboldt

143. That approach of human geography which describes physical setting as one determining man's mode of life is:
A. Determinism
B. Possibilism
C. New Determinism
D. Probabilism

144. Geographical voluntarism suggest that:
A. Man determines his own mode of life
B. Man's mode of life is the result of interaction between man and environment.
C. Nature is all powerful and it determines the mode of life of man.
D. God is the sole planner of man's activities.

145. The climatic influence of man is expressed by:
A. Climatic Analogy
B. Adversity theory
C. Diet theory
D. Climatic Hypothesis

146. Who amongst the following made the pioneering effort for delineating the population-resource regions of the world:
A. A.E. Ackerman B. J.I. Clarke
C. G.T. Trewartha D. W. Zelinsky

147. The theme of time and evolution was taken by which of the following geomorphologist:
A. Humboldt B. Penck
C. Davis D. Kant

148. Who stressed the importance of climate of human activities?
A. Robinson B. Dickinson
C. P.E. James D. Huntington

149. The founder of Determinism in human geography is:
A. Aristotle B. Hippocrates
C. Strabo D. Carl-Ritter

150. The term Social Darwinism was coined by:
A. Hartshorne B. Haeckel
C. Darwin D. Spancer

151. "Die Eerdkunde" was written by:
A. Ritter B. Kant
C. Humboldt D. Spencer

152. Form of exploration in which phenomena and observations are understood as outcomes is also known as the philosophy of:
A. Possibilism B. Determinism
C. Probabilism D. Teleology

153. The person responsible for the development of determinism are:
A. Vidal de la Blache and Bruhnes
B. Ratzel and Semple
C. Humboldt and Ritter
D. Kant and Kjellen

154. Which geographer was most influenced by the ideas of Charles Darwin?
A. Ratzel B. Ritter
C. Kant D. Huntington

155. The person who secured a place for man in geographical studies is:
A. Demangeon
B. Friedrich Ratzel
C. Paul Vidal de La Blache
D. W.M. Davis

156. Human geography can be defined as:
A. the description and explanation of locational differences among various Phenomena, caused by human action, distributed of the surface of the earth
B. man's impact on the environment
C. the relationship between man and environment
D. that branch of geography whihc deals with the human side of the world.

157. The doctrine that argues that within a frame work there are a number of choices that human beings can make about their activity, is:
A. Probabilism
B. New Determinism
C. Determinism
D. Possibilism

158. Who proposed the reduction of geography to social morphology?
A. Emile Durkheim
B. Vidal de la Blache
C. Jean Brunches
D. Lunda

159. One French geographer who followed the new Kantian philosophy of space was:
A. De martonne
B. Vidal dela Blache
C. Brunshes
D. Baulig

160. The concept that it is in man's power to achieve anything in any environment is known as:
A. possibilism B. new determinism
C. determinism D. probabilism

161. Though France is credited with developing the concept of possibilism, one of the earliest to present role of environmental and astrological influence on human life was:
A. Pierre
B. Montesque
C. Jean Bodin
D. None of the above

162. Cultural landscape:
A. shows the dominance of nature
B. is formed by ecological factors
C. shows a human stamp on environment
D. shows the effect of language

163. "Generes de vie" means:
A. Living space
B. Environment
C. Life style
D. Habitat

164. Who introduced the term "compage" in Human geography?
A. Whittlesay B. Mackinder
C. Spykman D. Herbertson

165. Who coined the term "cultural landscape"?
A. Hartshorne B. Carl O. Sawer
C. Fisher D. Kant

166. Who put forward the concept of probabilism?
A. Sawer B. Spate
C. Taylor D. Woolridge

167. ____ attempted to delineate the natural regions of the world on the basis of surface feature climate and vegetation.
A. Herberlson B. Stamp
C. Sawer D. Kant

168. The founder of possibilism in Human geography is:
A. Febure
B. Isaiah Bow man
C. Dickinson
D. Paul Vidal-de-la Blache

169. Brunsher's facts of destructive exploitation refers mainly to:
A. Hoe cultivation
B. Mining
C. Lumbering
D. All of above

170. Who used the word "ecology"?
A. Haeckel B. Odum
C. B. Commoner D. Tansley

171. The founder of concept of human ecology was:
A. Barrow B. Branasky
C. Anuchin D. Humboldt

172. Match the following:

(a)	Pragmatic Possibilism	1.	Tatham
(b)	Probabilism	2.	Spate
(c)	Stop and go Determinism	3.	Fevre
(d)	Possibilism	4.	G. Taylor

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	2	1	4	3
B.	3	1	2	4
C.	1	2	4	3
D.	2	3	1	4

173. One German geographer followed the Kantian tradition of space. He is:
A. Humboldt B. Ritter
C. Alfred Hettener D. Richthofen

174. Who used the world 'ensemble'?
A. Prestone James
B. Hartshorne
C. Henry-Baulig
D. de Martonne

175. One British geographer delineated regions from the view point of man's perception.
A. Fleure B. Herbertson
C. Faw cett D. Stamp

176. Which American geographer carried on the Kant Hettener tradition forward?
A. A. Hartshorne B. P.E. James
C. Brian Berry D. Walter Isard

177. Match the following:

(a)	Formal region	1.	Bhabar
(b)	Functional region	2.	Sovoks
(c)	Generic region	3.	Gangabasin
(d)	Specific region	4.	Coastal plains

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	4	3	1	2
B.	4	3	2	1
C.	4	2	3	1
D.	1	2	3	4

178. Who developed "the principle of least effort"?
A. Weber B. Haggerstrand
C. Christaller D. Zipf

179. The main contribution of Ritchthofen was in the field of:
A. Systematic geography
B. Geomorphology
C. Soil science
D. Climatology

180. Identify the geographer who was initially a quantitative geographer but as the moved to U.S.A. He became marxist geographer:
A. Kates
B. Cole and king
C. Brian Bery
D. David Harvey

181. Who amongst the following made a pioneering attempt of delineating major natural regions of the world:
A. A.J. Herbertson B. D. Whittlesey
C. J.N.L. Baker D. H.J. Fleure

182. Laboratory conditions are examples of:
A. Morphological system
B. Cascading system
C. Closed system
D. Open system

183. A theory of what ought to be rather than what actually occurs is called:
A. Positive theory
B. Possibilistic theory
C. Deterministic theory
D. Normative theory

184. Match the following:

(a)	Landscape studies	1.	Tuan
(b)	Residential Mobility	2.	Clark
(c)	Voting pattern	3.	Cox
(d)	Geometry of mind	4.	Tobbler

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	1	2	3	4
B.	3	2	4	1
C.	1	3	2	4
D.	4	3	2	1

185. One of the first to write on Geography of India was:
A. N.L. Chiber
B. S.C. Chatterjee
C. Al. Beruni
D. Spate and Learmonth

186. The first Indian Department of geography was established at:
A. Patna University
B. Delhi University
C. Madras University
D. Aligarh Muslim University

187. Match the following books and authors:

(a)	Kitab-ul-Hind	1. Humboldt
(b)	Cosmos	2. Ritter
(c)	Erd Kunde	3. Oscar Paschel
(d)	Das Ausland	4. Al-Beruni

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	4	1	2	3
B.	3	2	1	4
C.	1	2	3	4
D.	4	2	1	3

188. Match the following:

(a)	Vidal de la Blache	1. Geography of France
(b)	De Mangeon	2. Diccardie
(c)	Gallois	3. Regions de paus
(d)	M. Sorre	4. Lespyrennes

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	1	2	3	4
B.	4	3	2	1
C.	3	1	2	4
D.	3	1	4	2

189. Match the following French geographers and their main contributing field.

(a)	Political geography	1. M. Dubois
(b)	Colonial geography	2. De martonne
(c)	Physical geography	3. Jean Gott man
(d)	Megalopolis	4. Siegfried

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	1	2	3	4
B.	4	1	2	3
C.	3	1	2	4
D.	2	3	1	2

190. Videl formulated the:
A. Concept of New Determinism
B. Concept of Determinism
C. Concept of Possibilism
D. B and C

191. The principle of Terrestrial whole was given by:
A. Ritter B. Reclus
C. Brunches D. Vidal

192. Sovereign influence of environment over man is concerned by:
A. Blache B. Allen Semple
C. Brunches D. None of these

193. Nature is never more than an adviser said by:
A. Ritter B. Brunches
C. Blache D. Semple

194. The concept of areal differentiation was expounded by:
A. Alfred Hettner
B. Carl Saver
C. Ferdinand Von Ritchtofen
D. Richard Hartshorne

195. The 'principle of activity' was propounded by:
A. Reclus B. Ritter
C. Brunches D. Vidal

196. The principle of interaction was given by:
A. Vidal B. Ritter
C. Demangeon D. Brunches

197. 'Elisee Reclus':
A. was a disciple of Ratzel
B. was a french geographer
C. used deterministic approach in his writings
D. only B and C

198. Emmanuel Demartonne:
A. wrote La france physique
B. was basically physical geographer
C. was a relative of Vidal de la Blache
D. all of the above

199. The Royal geographical society of London was founded in:
A. 1930 B. 1845
C. 1830 D. 1820

200. The founder of the British school of Geography is:
A. Mackinder
B. Herbertson
C. Sirpatric Geddes
D. None of these

201. Mackinder formulated the concept of "Geographical" pivot of history in:
A. 1943 B. 1919
C. 1904 D. 1899

202. The concept of "Geographical pivot of History" is also known as:
A. World island theory
B. Rimland theory
C. Heartland theory
D. Air power theory

203. In the Heartland theory, mackinder identified a 'world island' which consisted of:
A. The continents of Eurasia and Africa
B. The continents of Africa
C. The continents of Eurasia
D. The Continents of Europe

204. The Britain and the British sea is authored by:
A. E.G.R. Taylor B. Sir Patric Geddes
C. Herbertson D. Mackinder

205. "The Democratic Ideals and Reality".
A. was published in Britain.
B. was published in 1919
C. is an account on "world power politics".
D. All of the above

206. The foundation of "Historical Geography' in Britain was laid by:
A. Geddes B. E.W. Gilbert
C. Herbertson D. Mackinder

207. Mackinder wrote:
A. The Democratic Ideas and Reality
B. The Britain and the British seas.
C. Man and his work.
D. A and B

208. The Book 'man and his work' was written by:
A. Herbertson
B. Herbertson's wife Dorothy
C. Both A and B
D. Mackinder

209. The British Geographer Herbertson's biggest contribution in his concept of the 'major natural regions'. He divided the world into:
A. 15 natural regions
B. 20 natural regions
C. 25 natural regions
D. 30 natural regions

210. The Races of England and wale's was written by:
A. Dorothy B. H. Robbert Mill
C. John Fleure D. Mahan

211. The 'Realm of nature' was written by:
A. H. Robert Mill B. Mackinder
C. Mahan D. Herbertson

212. 'The Le play society' England was established by:
A. H.J. Fleure
B. Mackinder
C. Geddes and his followers
D. All of the above

213. "The corridors of Time" a monumental work of H.J. Fleure written in collaboration with:
A. H.J.E. Deake
B. P.M. Roxby
C. H.R. Mill
D. Sir Patric Geddes

214. The founder of British regional studies especially regional survey, etc. is:
A. Mackinder
B. Mill
C. Sir Patric Geddes
D. Fleure

215. 'Locational Analysis in human geography' was authored by:
A. Chisolam
B. Mill
C. Peter Hagget
D. Mackinder

216. The father of modern economic geography is:
A. L.D. Stamp B. A.G. Ogilive
C. Chisolam D. Mahan

217. 'The founder of Modern geography' are:
A. Ritter B. Humboldt
C. A and B D. Penck

218. The author of models in human geography is:
A. L.D. stamp B. Peter
C. Hagget D. Mahan
E. R.J. Chorley

219. The author of the economic goegraphy of Britain (1949) is:
A. W. Smith B. Chisolam
C. Ogilive D. Mahan

220. The "quantitative Revolution" was started in:
A. Germany B. U.K.
C. U.S.A. D. France

221. In the post second world war period geography was recognised as a spatial science in:
A. Britain B. Germany
C. France D. Spain

222. The first professor of Geography in the U.S.A. was:
A. Shaler B. W.M. Davis
C. Arnold Guyot D. Mahan

223. "Nature and man in America" was written by:
A. Mark Jefferson
B. Arnold Guyot
C. Shaler
D. W.M. Davis

224. 'The Association of American Geographers' was established in:
A. 1934 B. 1924
C. 1914 D. 1904

225. Davis presented his "Theory of Cycle of Erosion" in the international geographical congress in:
A. 1943 B. 1919
C. 1904 D. 1899

226. In the Later years of his life, Davis became markedly.
A. supporter of religious basis of geographical thought
B. supporter of Ratzels organistic theory
C. ecological
D. teleological

227. The 'concept of central places' was propunded by:
A. Mark Jefferson B. Huntington
C. Davis D. Isaih Bowman

228. The 'pioneer Fringe' was written by:
A. Isaiah Bowman B. Huntington
C. Semple D. Mackinder

229. In the beginning of his carreer he was an 'environmental determinist', but later on he said 'Man is changing himself as well as the world as he goes along.' Who was he?
A. Salisbury B. Thorn bury
C. Isaih Bowman D. Ratzel

230. The geographer who was a close friend of president Roosewelt of the U.S.A. since 1921 and also took a prominent part in the world security conference in 1944 is:
A. Jefferson B. Isaiah Bowman
C. Salisbury D. Spate

231. 'The civiling rails' concept was given by:
A. Chisolam B. Isaih Bowman
C. Mark Jefferson D. Kant

232. Ellen Semple's classic work 'Influence of Geographical Environment' (1911) was highly influenced by:
A. Ratzel's political geography
B. Ratzel's organic theory of state and society.
C. Ratzel's Anthropogeographie
D. None of these

233. The concept of 'New Determinism' was put forward by:
A. Ritter B. Taylor
C. Semple D. Huntington

234. The author of "The main springs of civilization" is:
A. Salisbury
B. Griffith Taylor
C. Ells worth-Huntington
D. Hettner

235. The author of pulse of Asia is:
A. Hettner
B. Ritter
C. Huntington
D. Prince peterkropotkin

236. The "concept of hierarchy of central places" was formulated by:
A. Platt B. Whittlesey
C. Saver D. Brown

237. "Geography may be persued by two methods or upon two levels which may be distingusihed as General Geography and Specific Geography". Who said this?
A. Carl Ritter
B. Woolbridge and East
C. Humboldt
D. Huntington

238. Ellen Semple was a:
A. New determinist
B. Determinist
C. Possibilist
D. A and C

239. The migration zone theory of Race evolution was propounded.
A. Huntington B. Hettner
C. Taylor D. Spate

240. The law of primate city was given by:
A. Taylor B. Huntington
C. Mark Jafferson D. Salisbury

241. The mountain dwellar is essentially conservative. Hence innovation is repugnant to him speaks of:
A. Determinism
B. Possibilism
C. Probabilism
D. New determinism

242. The Desiccation theory of Asia was originally propounded by:
A. Kropotkin B. Huntington
C. Hettner D. Ratzel

243. Which one of the following is concerned with the study of glaciers?
A. Climatology
B. Pedology
C. Hydrology
D. Glaciology

244. Which of the following book is not written by Huntington?
A. The geography of the central Andes.
B. Weather and health
C. The principles of human geography.
D. Civilization and climate.

245. 'Ells worth Huntington' was:
A. An environmental determinist
B. A possibilist
C. A Probabilist
D. A Determinist

246. The author of 'Physiography' a classic on the evolution of land forms is:
A. Semple B. Huntington
C. Salisbury D. Taylor

247. The logical explanation of geography as a distinctive discipline was first advanced by:
A. Alexander Von Humboldt
B. Immanual Kant
C. Ferdinand von Ritchtofen
D. Richard Hartshorne

248. Which of the following books is not written by Grifith Taylor?
A. Our evolution civilization
B. Environment Race and Migration
C. Urban Geography
D. Mirror of Americans

249. The founder of the concept of Human ecology was:
A. Barrows B. Platt
C. Taylor D. Brown

250. The propounder of the crop intensity theory Von Thunen belongs to:
A. The British School
B. The German School
C. The French School
D. The American School

251. Theoretical problems of geography was written by:
A. Hagget B. Anuchin
C. Huntington D. Chorley

252. The Statement "the Land where water is abundant, people are gay and humourous while the people of dry and arid lands are short tempered" was given by:
A. Al-Maqdisi
B. Al -Masudi
C. Al-Balakhi
D. Aristotle

253. The relationship between man and its immediate surroundings by standing small homogeneous areas are known as:
A. cosmos
B. pays
C. Landschafts Kunde
D. Erdkunde

254. The "Radical school of geography" was established by:
A. Semple B. B.J. Alberi
C. R Peat D. Taylor

255. Which discipline of geography was described as the "core" by vidal de Lablache?
A. Physical geography
B. Historical geography
C. General geography
D. Regional geography

256. "We have man modifying nature and nature modifying man" statement was given by:
A. Semple B. Bukus
C. Kirchoff D. S. Taylor

257. The "geography in the 20th century" was written by:
A. S.M. Ali B. S. Taylor
C. P. Hagget D. Semple

258. "Nature does not drive man along a particular road, but it offers a number of opportunities from among which man is free to select". This statement implies.
A. Possibilistic approach
B. Probabilitic approach
C. Deterministic approach
D. New Deterministic approach

259. Isaiah Bowman, an American geographer belongs to:
A. Possibilist School
B. Determinist School
C. Dualist School
D. New Determinist School

260. Possibilism made its presence felt:
A. During interwar period
B. After the first world war
C. After the second world war
D. After the 15th century

261. "Mirror of Americans" was written by:
A. Brown B. Barrow
C. Taylor D. Isaih Bowman

262. The main soure of Ancient Indian geographical concept is:
A. The Mahabharata
B. The Vaidikas
C. The Ramayan
D. All of the above

263. Positive Relationship between forest and rainfall was given by:
A. Carl Ritter
B. Ptolemy
C. Alexander Humboldt
D. None of these

264. Basalt is conductive to piety was said by:
A. Kirchoff B. Humboldt
C. G. Taylor D. Semple

265. 'Paradigm of science' model was given by:
A. S.T. Kuhn B. L.D. Stamp
C. David Harvey D. Davis

266. The Life styles were central to the work of:
A. Febvre
B. Bowman
C. Vidal de lablache
D. Brunshes

267. The father of historical goegraphy of U.S. is:
A. Barrows B. Brown
C. Platt D. Taylor

268. "Geography as the study of areal differentiation" concept was developed by :
A. Hartshorne B. M. Jafferson
C. Herbertson D. Spate

269. The concept of sequent occupance was given by:
A. Barrows B. Platt
C. D. Whittlesey D. Taylor

270. I do not deny for a moment, that man plays a very important part, but he does not take fertilizer to the barren grounds was said by:
A. Taylor B. Semple
C. Ritter D. Brunshes

271. That "The history, culture, Living style and stage of development of a social group or nation are exclusively or largely governed by the physical factors of environment" is the essence of:
A. Possibilistic school of thought
B. Environmentalist school of thought
C. Determinist School of thought
D. New Determinist school of thought

272. The statement 'civilization is the product of moderate climatic adversity', was propounded by:
A. E Huntington B. Vidal de lablache
C. Dudley Stamp D. E. Semple

273. Which of the following pair is not correctly matched?

Persons	***Contributions***
A. Humboldt	Cosmos
B. Ptolemy	Alma gast
C. Ratzel	La Terre
D. Ritter	Erd Kunde

274. The concept of 'isodapane' to explain the deviation of plant from the point dedicated by minimum transportation cost was advanced by:
A. A. Webber B. E. Hoover
C. W. Isard D. A. Loesch

275. Geography as the study of Human-ecology was first of all propounded by:
A. Jean Bruhnes B. A.J. Herbertson
C. W. Bunge D. H. Barrows

276. Which of the following statements is not true about F. Ratzel?
A. He wrote a book on political geography.
B. He analysed the process of population migration
C. He advanced the concept of lebensraum
D. He was a stunch determinist

277. 'Morphology of Landscape' was written by:
A. W.M. Davis B. Car O, Sour
C. E. Huntington D. Patric Geddes

278. One of the scholars in Later half of the 19th century the exclusive study of physical phenomena in geography was:
A. E.C. Semple
B. Gerland
C. Richthofen
D. Recluse

279. The view that the study of relationship between any cels of phenomena cannot form the basis of any scientific discipline, was strongly put forth by:
A. Vidal de la Blache
B. H. Barrows
C. A. Hettner
D. G. Taylor

280. The relationship between climate and Relief was highlighted by:
A. Bueschug
B. Kant
C. Humboldt
D. Ritter

281. The concept of landscape in the sense of 'region' was given by:
A. German geographers
B. French geographers
C. British geographers
D. American geographers

282. 'Geography is the study of spatial interactions!' The above definition of geography was advanced by:

A. E. Huntington
B. Edward Ullman
C. W.M. Davis
D. E.C. Semple

283. The cultural patterns of India have been throughly analysed by:
A. A.K. Dutt
B. N.K. Bose
C. David Sopher
D. P.P. Karan

284. Radio-active theory of the origin of the mountains is related with:
A. Jolly B. Holmes
C. Paly D. Kober

285. The Relief of China was studied in great detail by:
A. Jean Bruhnes
B. Ferdinand von Richthofen
C. F Ratzel
D. Vidal de-la Blache

286. In Industrial location theory 'locational triangle' has been used by:
A. Smith B. Weber
C. Palander D. Hoover

287. In agricultural location theory, the concept of an 'isolated estate' was propounded by:
A. Whittlesey
B. Farmer
C. Smith
D. Von thunen

288. The principle of 'Genre de vie' was propounded by:
A. Jean Brunshes
B. Vidal de-la Blache
C. De mangean
D. Carl Saver

289. Who established the dictim : "Landscape is a function of structure, process and time".
A. Hutton B. King
C. W.M. Davis D. W.K. Davies

290. What is the correct chronological order of A-Blache, B-Kant, C-Ratzel and D-Ritter. Answer from code below:
A. ABCD
B. BACD
C. BDCA
D. DCBA

291. Which one of the following is not correctly matched?
A. Hettener – Positivism
B. Mackinder – Heartland theory
C. Herbertson – Natural regions
D. Saver – Sequent occupance

292. Match List I with List II and select the correct answer using the code given below:

List I	***List II***
(a) Mackinder	1. France
(b) Demangeon	2. U.K.
(c) Kant	3. U.S.A.
(d) Trewartha	4. Germany

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	3	4	2	1
B.	2	1	4	3
C.	4	3	2	1
D.	1	2	3	4

293. Who is a protagonist of social Darwinism?
A. Semple B. Huntington
C. Taylor D. Spencer

294. Geography was defined as the study of the patterns and processes of spatial organisation in:
A. Romantic Period
B. Darwinian Period
C. Period of Chorology
D. Period of Statistical Revolution

295. The concept of ecology was elaborated by:
A. Tansley B. Harvey
C. Hart shorne D. Taylor

296. To which of the following is E. Ackerman associated with:
A. Ecological School
B. Deterministic School
C. Spatial Organisation School
D. Social (Radical) School

297. Which one of the following time period is considered as renaissance in geography:
A. 400 AD – 1000 AD
B. 700 AD – 1100 AD
C. 800 AD – 1600 AD
D. 1100 AD – 1700 AD

298. The exponent of prima rum saver concept is:
A. Meyer hoff B. Penck
C. Davis D. Saver

299. Match List I with List II and select the correct answer using the code given below the lists:

List I	***List II***
(a) Present is key to the past	1. L.C. Peltier
(b) Landscape is a function of structure, process and time	2. W.M. Davis
(c) F = f (MP) t	3. K.J. Gregory
(d) Climatic geography	4. James Hutton

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	2	3	4	1
B.	4	2	3	1
C.	4	3	1	2
D.	3	1	2	4

300. Which one of the following is related to modificaiton in Devisian cyclic model?
A. Law of unequal slope
B. Law of allometric growth
C. Equilibrium model
D. Episodic erosion model

301. The term peri glacial was introduced by:
A. Lozinski B. De Terra
C. Peltier D. Moneymaker

302. Who amongst the following scholars first declared that the earth is spherical?
A. C. Ptolemy B. S. munster
C. I. Kant D. P. Apian

303. Which one of the following persons has used evapotranspiration for the classification of the world climate?
A. Koppen B. Trewartha
C. Thornth waite D. Kendrew

304. Select the correct chronological order of the following scholars who have contributed to the development of geography, using the code given below:
Scholars
1. Freidrich Ratzel
2. Alexander Von Humboldt
3. Alfred Hettener
4. Vidal de la Blache

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	1	2	3	4
B.	2	1	4	3
C.	4	2	1	3
D.	3	1	2	4

305. Who amongst the following sholars first used the word "geographica"?
A. Ptolemy B. Kant
C. Eratosthenes D. Ratzel

306. Who amongst the following scientists first provided evidence of ozone depletion over the antarctica?
A. M. Molina B. S. Rowland
C. J. Farman D. M.L. Parry

307. Which one of the following scholars had divided the world into major agricultural regions?
A. Kostrowicki B. Von Thunen
C. Waver D. Whittlesey

308. The principle of uniformitarianism was propounded by:
A. Arthor Holmes B. Charles Lyell
C. Markus Reiner D. S.W. Carey

309. The division of the world into major natural regions was first made by:
A. Dudley Stamp
B. Herbertson
C. Vidal de la Blache
D. Hettener

310. Who of the following proposed planning regions of India?
A. S.C. Chatterji B. S.M. Ali
C. V. Nath D. George Kuiyan

311. Who among the following used hair texture to classify world races into five major categories?
A. A.L. Kroeber B. Bluemen Basve
C. Txuxley D. Von Eickstedt

312. Who amongst the following is associated with the neo-deterministic school of human geography?
A. E.C. Semple B. F. Ratzel
C. J. Brunhes D. R. Smith

313. Which one of the following scholars is associated with the concept of areal functional organisation?
A. A.K. Philbrick
B. E.K. Sachaefer
C. E.W. Timmerman
D. R.O. Buchanan

314. Match List I with List II and select the correct answer using the code given below:

List I French geographers	***List II Books***
(a) Demangeon	1. Les pyrenecs
(b) Sorre	2. Les Alpes
(c) Demartonne	3. French Alps
(d) Blanchard	4. Picardie

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	4	3	2	1
B.	4	1	2	3
C.	2	1	4	3
D.	3	4	2	1

315. Which of the following statements is not constant with possibilism?
A. It believes in full freedom of man's activities.
B. It allows choice of occupation and way of life in a given environment.
C. It relies on the technological capabilities of man
D. It presupposes absolute in eneffectiveness of nature's potential and processes of man.

316. The concept of geography as Human ecology was propounded by:
A. N.H. Barrows
B. R.E. Dickinson
C. Richard Hartshorne
D. Dwhittlesey

317. **Assertion (A):** Place is the basis of geography.
Reason (R): Geography is primarily concerned with spatial relationships.
Codes:
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

318. Which of the following combinations is correctly matched. Select the correct answer from the code given below:
1. Alexander von Humboldt — Cosmos
2. Cart Ritter — Erdkunde
3. Immanuel Kant — Physical Geography
4. Jean Bruhnes — Principles of Human geography

A. 1, 2 and 4 B. 1, 3 and
C. 1, 2 and 3 D. All the above

319. Who of the following has been the best exponent of determinism?
A. M. Sorre B. C. Sauer
C. G. Taylor D. E. Huntington

320. Who amongst the following propounded the concept of base level of erosion?
A. J.W. Powell B. G.K. Gilbert
C. W.M. Davis D. M. Morisawa

321. The polar front theory of the origin of temperate cyclones has been given by:
A. Lampert B. Bjerkenes
C. Trewartha D. Pana

322. Who amongst the following is the author of the book "Foundations of Human geography"?
A. C. Saver B. G. Taylor
C. J. Brunhes D. M. Sorre

323. Who amongst the following has used the standard deviation method for the functional classification of urban centres?
A. C.D. Harris B. G.A. Moser
C. H.J. Nelson D. J.W. Webb

324. Match List I with List II and select the correct answer using the code given below the lists:

List I ***Author***		***List II*** ***Book***
(a) A.K. Philbrick	1.	Anthropo-geographie
(b) F. Ratzel	2.	This human world.
(c) I. Sowman	3.	Geographical Introduction to history
(d) L. Febvre	4.	Geographical and social sciences

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	2	1	4	3
B.	1	2	4	3
C.	2	3	1	4
D.	3	1	2	4

325. Which of the following pair is not correctly matched?
A. Ecological approach — H.H. Barrow
B. Welfare approach — D.R. Stoddart
C. Quantitative approach — D.F. Marble
D. Functional approach — W. Christaller

326. "There are no necessities but everywhere possibilities". The above statement is attributed to:
A. Jean Brunhes B. C.D. Forde
C. L. Febvre D. G. Taylor

327. The theory of demographic transition was propounded by:
A. J. Clarke
B. G.T. Trewartha
C. F.W. Notestein
D. J.J. Spengler

328. Which one of the following is not correctly matched?
A. J.A. Garnier — Geography of population
B. R. Woods — Population geography and the developing countries.
C. G.T. Trewartha — The more developed Realm : A geography of its population
D. W. Zelinsky — A prologue to population geography

329. The concept of organic culture is associated to:
A. A. Von Humboldt
B. F. Ratzel
C. C. Ritter
D. R. Hartshorne

330. Match List I with List II and select the correct answer using the code given below:

List I ***Book***		***List II*** ***Author***
(a) Main springs of civilization	1.	Carl O. Saver
(b) Influences of geographic Environment	2.	D.M. Smith
(c) Morphology of Landscape	3.	E. Huntington
(d) Where the Grass is Greener	4.	E.C. Semple

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	3	4	1	2
B.	3	2	1	4
C.	1	4	2	3
D.	4	3	1	2

331. The concept of distinctive ways of life (Genre devie) was propounded by:
A. C.D. Forde
B. E. Reclues
C. Vidal de La Blache
D. Jean Brunhes

332. Peter Ambrose is the author of:
A. Analytical Human geography
B. Human geography : A welfare approach.
C. The earth and man
D. Mental Map

333. Geography was characterised by "dualism" during:
A. Classical (Romantic) Period.
B. Renaissance period
C. Post-Darwanian Period
D. Modern Period (Post World War II)

334. Geography must serve the cause of human welfare. This stand point is represented by:
A. The ecological school
B. The locational school
C. The traditional school
D. The radical school

335. The nature of geography first published in 1939 by the Association of American geographers was authored by:
A. W.M. Davis
B. B.J.L. Berry
C. Richard-peet
D. Richard Hartshorne

336. The paper Exceptionalism in geography which marked a turning point in geographic thought was written by:
A. Z.K. Zipf B. C.D. Harris
C. W. Shaefer D. W. Christaller

337. The scholar in later half of the 19th century who pleaded for the exclusive study of physical phenomena in geography was:
A. Gerland B. Richthofen
C. E.C. Semple D. Recluse

338. Match List I with List II and select the correct answer from the code given below:

List I	***List II***
Geographers	***Nationality***
(a) Mackinder	1. France
(b) Blache	2. U.K.
(c) Ratzel	3. U.S.A.
(d) Davis	4. Germany

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	3	1	4	2
B.	2	1	4	3
C.	2	3	1	4
D.	1	4	2	3

339. Who among the following developed the model known as the 'Locational triangle'?
A. Walter Christaller
B. Alfred Weber
C. August Losch
D. Max Weber

340. Christaller's concept of centrality is based on:
A. Hierarchy
B. Law of gravitation
C. Principle of "Least effort"
D. Range of a good

341. Regionalization of world agriculture on a systematic basis was first attempted by:
A. D. Whittlesey B. L.D. Stamp
C. Griffith Taylor D. Carl Ritter

342. The author of "The story of integration of Indian States' was:
A. K.M. Pannikar B. K.M. Munshi
C. G. Myrdal D. U.P. Menon

343. Who among the following is the author of the concept of 'stop-and-go determinism"?
A. Alfred Hettner B. Griffith Taylor
C. L.D. Stamp D. Jean Brunhes

344. The rank size rule is a concept that is concerned with the study of one of the following:
A. Urban Settlements
B. Rural Settlements
C. Rural-Urban Belt
D. Metropolitan Cities

345. Which of the following criteria is not used for the classification of human races:
A. Eyes B. Nose
C. Ear D. Hair

346. With which scholar the statement "present is the key to the past' is associated:
A. C.M. King B. W.M. Davis
C. James Hutton D. Walter Penck

347. The concept of possibilism as opposed to environmental determinism has been propounded by:

A. Ratzel
B. Hettner
C. Semple
D. Vidal de La Blache

348. The principle in which the effect of natural environment on man is presumed paramount.
A. Determinism
B. Possibilism
C. Neo determinism
D. Probabilism

349. Who amongst the following geographers first used the term "pragmatic possibilism":
A. K. Ritter B. G. Tathom
C. J. Brunhes D. G. Taylor

350. The first detailed map of India was prepared by:
A. D. Anville B. Eratosthenes
C. Ptolemy D. James Rennel

351. 'Cartography includes' the whole Series of map making from an actual survey of the ground to printing of the map'. This definition is given by:
A. Robinson B. Raisz
C. Monkhouse D. Kellaway

352. Which one of the followning groups represents the protagonists of possibilism:
A. Ellsworth Huntington, P. Blasche and J. Brunhes.
B. P. Blasche, J Brunhes and I. Bowman
C. J. Brunhes, O.H.K. Spate and P. Blasche
D. O.H.K. Spate, J. Brunhes and G. Taylor

353. 'Geography is concerned with accurate, orderly and rational description and interpretation of the variable character of the surface of the earth'. The above definition of geography occurs in the book of:
A. Morphology of Landscape
B. Nature of geography
C. Perspective on the nature of geography
D. Theoratical geography

354. To which of the following paradigms of geographical thought is Richard peet associated?
A. Areal differentiation
B. Spatial organisation
C. Radical geography
D. Behavioural geography

355. The concept of 'Geography as Human ecology' was advocated by:
A. J. Clarke
B. H.H. Barrows
C. Richard Hartshorne
D. David Smith

356. Match List I with List II and select the correct answer using the code given below the lists—

List I ***Book***	***List II*** ***Authors***
(a) Kosmos	1. Carl Ritter
(b) Erd Kunde	2. Ratzel
(c) Anthropo-geographie	3. Von Humboldt
(d) Nature of geography	4. Hartshorne

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	4	2	1	3
B.	2	3	4	1
C.	2	3	1	4
D.	3	1	2	4

357. Who was the first map maker?
A. Eratosthenes
B. Possidonius
C. Anaximander
D. Thales

358. Gnomon is:
A. The name of geographer of greece
B. Name given to north wind by Homes
C. An instrument just like a sundial
D. Both B and C

359. Longitude and Latitude term was first used by:
A. Ptolemy B. Homer
C. Eratosthenes D. None of the above

ANSWER

1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
C	C	A	C	A	C	B	B	A	A
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
C	B	C	C	A	B	C	A	C	D
21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
A	B	C	B	C	A	B	D	A	A
31	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
B	B	B	B	A	D	C	B	A	A
41	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**
D	C	A	B	A	C	C	C	D	C
51	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
A	B	C	C	D	B	C	A	A	B
61	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**
C	A	A	B	A	D	C	D	C	E
71	**72**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**
D	D	B	A	D	B	B	A	C	C
81	**82**	**83**	**84**	**85**	**86**	**87**	**88**	**89**	**90**
B	A	B	A	B	D	C	D	B	B
91	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**100**
B	A	A	C	B	A	C	A	A	C
101	**102**	**103**	**104**	**105**	**106**	**107**	**108**	**109**	**110**
A	A	C	C	C	B	A	A	D	B
111	**112**	**113**	**114**	**115**	**116**	**117**	**118**	**119**	**120**
C	C	B	C	B	A	B	C	B	A
121	**122**	**123**	**124**	**125**	**126**	**127**	**128**	**129**	**130**
C	B	D	D	C	A	A	D	C	B
131	**132**	**133**	**134**	**135**	**136**	**137**	**138**	**139**	**140**
C	B	A	C	C	D	A	D	B	C
141	**142**	**143**	**144**	**145**	**146**	**147**	**148**	**149**	**150**
D	A	A	B	A	A	C	D	A	D
151	**152**	**153**	**154**	**155**	**156**	**157**	**158**	**159**	**160**
A	D	C	A	C	A	D	A	B	A
161	**162**	**163**	**164**	**165**	**166**	**167**	**168**	**169**	**170**
C	C	C	A	B	B	A	D	B	A
171	**172**	**173**	**174**	**175**	**176**	**177**	**178**	**179**	**180**
A	C	C	A	A	A	B	D	A	D
181	**182**	**183**	**184**	**185**	**186**	**187**	**188**	**189**	**190**
A	C	D	A	A	D	A	A	B	C
191	**192**	**193**	**194**	**195**	**196**	**197**	**198**	**199**	**200**
D	A	C	D	C	D	D	B	C	A
201	**202**	**203**	**204**	**205**	**206**	**207**	**208**	**209**	**210**
C	C	C	D	D	D	D	C	A	B
211	**212**	**213**	**214**	**215**	**216**	**217**	**218**	**219**	**220**
A	C	A	C	C	C	C	D	A	C

221	**222**	**223**	**224**	**225**	**226**	**227**	**228**	**229**	**230**
A	C	C	D	D	C	A	A	C	B
231	**232**	**233**	**234**	**235**	**236**	**237**	**238**	**239**	**240**
C	C	B	C	C	A	B	B	C	C
241	**242**	**243**	**244**	**245**	**246**	**247**	**248**	**249**	**250**
A	A	D	A	A	C	B	D	A	B
251	**252**	**253**	**254**	**255**	**256**	**257**	**258**	**259**	**260**
B	B	B	C	D	B	B	A	A	C
261	**262**	**263**	**264**	**265**	**266**	**267**	**268**	**269**	**270**
A	A	C	A	A	C	B	A	C	A
271	**272**	**273**	**274**	**275**	**276**	**277**	**278**	**279**	**280**
C	A	C	A	D	B	B	C	B	C
281	**282**	**283**	**284**	**285**	**286**	**287**	**288**	**289**	**290**
D	B	B	A	B	B	D	B	C	C
291	**292**	**293**	**294**	**295**	**296**	**297**	**298**	**299**	**300**
A	B	D	D	A	C	D	B	B	A
301	**302**	**303**	**304**	**305**	**306**	**307**	**308**	**309**	**310**
A	A	D	B	C	C	D	B	B	C
311	**312**	**313**	**314**	**315**	**316**	**317**	**318**	**319**	**320**
C	B	D	B	D	A	A	C	D	A
321	**322**	**323**	**324**	**325**	**326**	**327**	**328**	**329**	**330**
B	D	C	A	C	C	C	B	B	A
331	**332**	**333**	**334**	**335**	**336**	**337**	**338**	**339**	**340**
C	A	C	D	D	C	A	B	B	A
341	**342**	**343**	**344**	**345**	**346**	**347**	**348**	**349**	**350**
A	A	B	A	C	C	D	A	B	C
351	**352**	**353**	**354**	**355**	**356**	**357**	**358**	**359**	
C	B	C	C	B	D	C	C	A	

6 Human Geography

1. Which of the following countries has attained replacement level population growth?
A. France B. China
C. Sudan D. Iran

2. Kirghiz is a wandering tribe of:
A. Central Asia B. S.E. Asia
C. Western Asia D. South Asia

3. The settlements of desert areas are characterised by:
A. evenly distributed population
B. dispersed population
C. nucleated population
D. scattered population

4. In which of the following regions are the pygmies found?
A. Sahara
B. Kalahari
C. Equatorial Forests
D. Pampas

5. The biggest city in China in terms of population is:
A. Beijing B. Canton
C. Mukden D. Shanghai

6. Which one of the following is not a major human agglomeration in the world?
A. East Asia B. South Asia
C. Western Europe D. South America

7. The correct desending order of the following countries in terms of their total population is:
A. Bangladesh, Brazil, Indonesia, Japan
B. Bangladesh, Maxico, Japan, Ethiopia
C. Japan, Brazil, Bangladesh, Indonesia
D. Indonesia, Brazil, Japan, Bangladesh

8. Which of the following pairs is correctly matched? Select the correct answer from the code given below:

(a) Vedda	1. Food gathering
(b) Kukis	2. Shifting cultivation
(c) Bhotias	3. Transhuman
(d) Todas	4. Sedentary Cultivation

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	1	2	3	4
B.	1	3	4	2
C.	2	3	4	1
D.	1	2	3	4

9. Which of the following is the typical feature of the Negroid race?
A. Black skin
B. Broad nose
C. Prognathous jaw
D. Scanty hair on the bow

10. The concept of Pemographic transition is based on the trends in:
A. fertility rate.
B. birth and death rate.
C. life expectancy.
D. rural, urban migration.

11. Semang tribes are the inhabitants of:
A. Malaya Peninsula.
B. Central Hills of Sri Lanka.
C. Great Desert of Australia.
D. Eastern Highlands of Africa.

12. Match List I with List II and select the correct answer using the code given below the lists:

List I	***List II***
Australian States	***Cities***
(a) Queensland	1. Adelaide
(b) South Australia	2. Brisbane
(c) Victoria	3. Kalgoorlie
(d) Western Australia	4. Melbourne
	5. Sydney

Codes:

	(a)	(b)	(c)	(d)
A.	2	5	4	1
B.	3	1	2	4
C.	2	1	4	3
D.	1	5	2	3

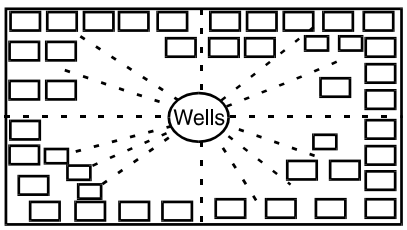
13. Match List I with List II and select the correct answer using the code given below the lists:

List I	***List II***
(a) Compact	1. Chile
(b) Elongated	2. U.S.A.
(c) Quadrangular	3. Hungary
(d) Fragmented	4. India

Codes:

	(a)	(b)	(c)	(d)
A.	3	1	4	2
B.	1	4	2	3
C.	4	3	2	1
D.	2	3	1	4

14. Given figure depicts the typical model of community-dwellings of a tribe. Select the correct answer from the code given below:



Code:

A. Dwellings of Boro
B. Dwellings of Badawin
C. Dwellings of Masai
D. Dwellings of Nagas

15. Study the following statements about Bushmen of Kalahari desert and select the correct answer using the code given below:

Statments:

1. They are fruit gatherers.
2. They never kill animals.
3. They smear their bodies with a thick paste.
4. They do so to protect themselves from insects.

Codes:

A. 1 and 3 are correct
B. 2 and 4 are correct
C. 3 and 4 are correct
D. 1 and 2 are correct

16. Which one of the following countries has the lowest birth rate?

A. France B. Japan
C. Germany D. U.S.A.

17. In which of the following countries the sex ratio is calculated as number of males per hundred females?

A. India B. New Zealand
C. Russia D. U.S.A.

18. According to the U.N. population division the lowest fertility rate is in:

A. Australia. B. France.
C. Italy. D. Sweden.

19. In terms of total population the correct descending order of the given countries is:

A. C.I.S., Germany, U.K., France
B. C.I.S., UK, France, Germany
C. France, U.K., Germany, CIS
D. C.I.S., France, U.K., Germany

20. Study the following statements.
Assertion (A): The main habitat of the mikir tribe is the mikir hills of Asom.
Reason (R): The principal occupation of the mikirs is hunting.
Select the correct answer using the code given below.

Codes:

A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

21. The incidence of poverty in rural India, is because:

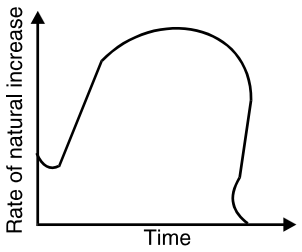
A. the people are engaged in agriculture.
B. the people are not hard working.

C. of rural unemployment and under employment
D. of lack of the means of transportation.

22. The primitive people of Japan are:
A. Ainu. B. Bantu.
C. Sakai. D. Vedda.

23. Which one of the following pairs is correctly matched?
A. Heidelbergman — South Africa.
B. Soloman — Germany.
C. Cromagnon man — France
D. Rhodesian Man — Java

24. Given fig. the curve shows the rate of natural increase of population, which of the following shall cause the curve to move downward.



1. Decline in birth rate.
2. Stable death rate.
3. Rise in death rate.
4. Out-migration.

Select the correct anser using the code given below
Codes:
A. 1 and 2 are correct.
B. 1 is correct.
C. 1, 2 and 3 are correct.
D. All are correct

25. Rural Peasant markets represent:
A. a two way trade between production consumption areas
B. a one-way trade from production to consumption areas
C. a complex system of trade
D. No system at all

26. Near Neighbour statistic is applied to test the randomness in:
A. Animal population
B. Human settlements
C. Prainage density.
D. Transportation network.

27. Transnumance is practiced by the:
A. Bhils B. Bhotias.
C. Kukis. D. Nagas.

28. Which one of the following denotes the crude birthrate during a year?
A. No. of born children per 1,000 females.
B. No. of born children per 1,000 persons.
C. No. of born live children per 1,000 females.
D. No. of born live children per 1,000 persons.

29. Urbanization is normally defined as:
A. a demographic phenomenon.
B. economic changes due to industrialization.
C. process of social change.
D. all the above three.

30. Which of the following criterion is not used in the Indian census for the identification of urban centres?
A. Population size
B. Population-function
C. Population density
D. Population behaviour

31. **Assertion (A):** In the geographical study of human settlements both form and process are important.
Reason (R): Ameitzen put emphasis on genetic approach in settlement geography.
Select correct answer using the code given below.
Codes:
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

32. The theory of demographic transition was propounded by:
A. J. Clarke. B. G. T. Trewartha.
C. F. W. Notestein D. J. J. Spengler.

33. Among the SAARC countries the highest density of population is found in:
A. Bangladesh B. India
C. Pakistan D. Sri Lanka

34. Which one of the following is not correctly matched?
A. J. A. Garnier – Geography of population
B. R Woods – Population geography and the develping countries
C. G. T. Trewartha – The more developed Realm : A Goegraphy of its population
D. W. Zelinsky – A prologue to population geography

35. **Assertion (A):** Two percent of the world's people live outside their country of birth.
Reason (R): Rural urban migrations are primarily a response to economic motives.
Codes:
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

36. The concept of "Geography as Human ecology" was advocated by:
A. J. Clarke
B. H. H. Barrows
C. Richard Hartshorne
D. David Smith

37. Which of the following is the correct sequence of cities in descending order of their population?
A. Tokyo, Mumbai, Beijing, Seoul
B. Beijing, Mumbai, Seoul, Tokyo
C. Mumbai, Tokyo, Seoul, Beijing
D. Seoul, Tokyo, Beijing, Mumbai

38. Which one of the following capital cities was initially built in the form of puzzle box?
A. Beijing B. Rome
C. Tokyo D. Vatican city

39. The rank-size rule is a concept that is concerned with the study of one of the following:
A. Urban settlements
B. Rural settlements
C. Rural-urban belt
D. Metropolitan cities

40. Which of the following criteria is not used for the classification of human races?
A. Eyes B. Nose
C. Ear D. Hair

41. Which one of the following regions is most urbanised?
A. East Asia
B. South Asia
C. Europe
D. Australia-New Zealand

42. Hierarchy of urban places is determined on the basis of:
A. population size B. area
C. functions D. growth rate

43. Match List I with List II and select the correct answer using the code given below the lists:

List I ***People***	***List II*** ***Location***
(a) Mullato	1. Japan
(b) Ainu	2. Scandinavia
(c) Lapps	3. Brazil
(d) Mestizo	4. Mexico

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	4	3	1	2
B.	3	1	2	4
C.	2	4	3	1
D.	1	2	4	3

44. Consider the following statements and choose your answer from the code given below:
Assertion (A): The three aspects of distribution of agrarion settlements are dispersion, density and pattern.
Reason (R): Compact settlements, predominate, in the most parts of the world.
Codes:
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A

C. A is true but R is false
D. A is false but R is true

45. Crude death rate is exhibiting an increasing trend in:
A. Africa B. Europe
C. South America D. Oceania

46. The Egyptian type of population Resource Region is characterised by:
A. high technology, low population-resource ratio
B. high technology, high population-resource ratio
C. low technology, high population-resource ratio
D. low technology, low population-resource ratio

47. Match List I with List II and select the correct answer using the code given below the lists:

List I	***List II***
	Hunting Tribes	***Habitat***
(a) Bush men	1. Greenland
(b) Boro	2. Congo basin
(c) Pygmy	3. Amazon basin
(d) Eskimo	4. Kalahari

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	1	2	3	4
B.	4	3	2	1
C.	2	3	4	1
D.	4	2	3	1

48. Consider the following statements:
Assertion (A): There is close correlation between education and population control.
Reason (R): The decline in fertility rate in Kerala provides the best example.
Select the correct answer using the code given below.
Codes:
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

49. Which one of the following countries is not a member of SAARC?
A. Nepal B. Thailand
C. Pakistan D. Bangladesh

50. Which one of the following is called Europort?
A. London B. Amsterdam
C. Hamburg D. Rotterdam

51. More than half of the world's population lives in latitudes:
A. 0° – 20°N
B. 0° – 20°S
C. 20°N – 40°N
D. 40°N – 60°N

52. The main occupation of lapps is:
A. hunting and food gathering.
B. herding and fishing.
C. pastoral, nomadism.
D. shifting cultivation.

53. Which one of the following is not a major human agglomeration in the world?
A. East Asia B. South Asia
C. Western Europe D. South America

54. The father of Human Geography is:
A. Herodotus
B. Hecataeus
C. Vidal de la Blache
D. Brunhes

55. 'Strong point settlement' occurs near the:
A. Passes B. Hill tops
C. Bridge sites D. All of the above

56. Environmental determinism maintains that:
A. the physical environment dtermines man's economic activities.
B. the economic resources determine man's cultural activities.
C. the physical environment partially determines man's social and cultural activities.
D. none of the above

57. The author of the principles of Human geography is:
A. Huntington. B. Semple.
C. La Blache. D. None of these.

58. Man is a habitant tool-maker from history because:
A. he is a thinker unlike other animals.
B. he is intrinsically lazy
C. he wanted to increase productivity.
D. he did not want to use his limbs.

59. The reduction in international migration can be attributed to:
A. restrictions imposed by the government
B. changed altitudes of the people
C. feeling of nationalism
D. decrease of economic prospects

60. Low population density in some developed nations like Australia, has resulted in:
A. slow development of resources
B. high per capita income
C. better health conditions
D. export of food products

61. Problems de Geographie Humaine is written by:
A. Jean Brunhes
B. Ratzel
C. Martonne
D. Albert Demangeon

62. Geographie Humaine is authored by:
A. La Blache B. Ratzel
C. Miss Semple D. Jean Brunhes

63. Pinciples de Geographie Humaine is written by:
A. Martonne
B. Jean Brunhes
C. La Blache
D. Albert Demangeon

64. Most universally accepted criterion to define a town is:
A. population density
B. population size
C. municipally administered
D. function

65. Which of the following are not pastoral nomads?
A. Pygmies B. Kazaks
C. Masai D. Lapps

66. Hunting and gathering is the main occupation of which tribe?
A. Turks B. Bushman
C. Negroes D. None of these

67. Urban growth is now taking place at a faster rate in the:
A. tropics than in the North America
B. western world than in the tropics
C. western world
D. None of these

68. The villages of Lorraine (France) are notable for their:
A. linear pattern
B. star shaped pattern
C. square and compact
D. rectangular pattern

69. Which of the following settlement is of relatively recent date?
A. Star type B. Dispersed type
C. Linear type D. Nucleated type

70. Zone of contact settlement occurs:
A. between village and towns
B. between hill tops and low lands
C. between forests and cultivated lands
D. Only B and C

71. Hyper markets are shopping centres located:
A. near the C.B.D.
B. near rail-road junction
C. out of town
D. none of these

72. Christaller's K = 4 represents:
A. Marketing principle
B. Traffic principle
C. Administrative principle
D. All of these

73. The rank size rule of the spacing of cities was given by:
A. C. D. Harris B. Ulman.
C. G. K. zip D. G. Sjoberg

74. The sector theory of urban structure was given by:
A. H Hoyt B. M. R. Davie
C. Both A and B D. None of these

75. The Radiant city idea of city planning was propounded by:
A. Clarence Perry (American)
B. Le Corbusier. (French)
C. A. S. Mata. (Spanish)
D. F. L. Wright (American)

76. The concentric or zonal theory was porpounded by:
A. Burgess B. Vance
C. Murphy D. Ullman

77. The multiple nuclei theory of town planning was given by:
A. C. D. Harris B. Ullman
C. Burges D. Both A and B

78. The term megalopolis was coined by:
A. J. Gottman B. Burgess
C. H. Hoyt D. C.D. Harris

79. Hinter Land is frequently applied to:
A. the area in the middle of the plateau
B. the area commanding a central position
C. the areas served by a port
D. None of the above

80. The central place theory of town planning was given by:
A. M. Jafferson B. Christaller
C. Burgess D. None of these

81. Shanty town refers to:
A. extreme poverty, backing in menities and exceptionally high morality rate
B. a district of temporary, squatter dwellings
C. Generally over crowded
D. All of the above

82. Christaller's k = 7 represents:
A. marketing principle
B. administrative principle
C. traffic principle
D. None of these

83. Wet point settlement occurs near the:
A. source of water B. coastal plains
C. deltas D. passes

84. The dispersed city has idea of city planning was given by:
A. Ullman
B. F. L. Wright
C. Harris
D. None of the above

85. The pioneer study of the CBD was done by:
A. Burges
B. Murphy and Vane
C. C. D. Harris and Ullman
D. None of the above

86. The book pre industrial city was written by:
A. G. S. Joberg B. J. Gottman
C. G. K. Zipf D. Ullman

87. The law of primate city was propounded by:
A. M. Jafferson B. G. K. Zipf.
C. Burgess D. Christaller

88. The idea of Garden cities was given by:
A. G. T. Ranner B. Semple
C. Howard D. P. Hall

89. In all the urban settlements in an area are ranked in descending order of population. The population of then town will be $^1/_4$th that of the largest.
A. Central place theory
B. Hierarchy of towns
C. Rank-size rule
D. Law of primate city

90. The tone of discard is the:
A. CBD of present B. CBD of past
C. CBD of future D. None of these

91. The prairie settlement of N. America are of:
A. Linear type
B. Dispersed type
C. Sometimes both nucleated and dispersed
D. Always nucleated type

92. Permating is:
A. a dry point settlement in Malaysia
B. a wet point settlement in the Netherlands
C. a dry point settlement in Indonesia
D. none of these

93. Dry point settlements are:
A. always nucleated type
B. always dispersed type
C. sometimes both nucleated and dispersed
D. Neither nucleated nor dispersed type

94. Terpen is:
A. a rural settlement built on a man made mounds in the Netherlands
B. a rural settlement in Malaysia
C. a rural settlement in Indonesia
D. none of these

95. Who divided any urban area into three zones?
A. A. E. Smailes B. Dickinson
C. J. H. Johnson D. Harris

96. Who presented an important modification of Christallers's central place theory
A. Ullman B. Murphy
C. Losch D. J. Watson

97. Jengka triangle is located in:
A. Malaysia
B. Indonesia
C. the Netherlands
D. none of these

98. The peasant Chalets are a type of settlement common in:
A. Germany B. Hungary
C. the Netherland D. Switzerland

99. Who divided any urban area into three zones, namely, a core area, outer area and a fringe area:
A. J.H. Johnson B. Dickinson
C. A.E. Smailes D. Harris

100. The major theme in human geography in the 1960s was:
A. the study of Spatial System
B. the study of Spatial Organization of Society
C. the study of Spatial Organization of Society
D. None of these

ANSWER

1	2	3	4	5	6	7	8	9	10
A	A	C	C	D	D	B	B	C	B
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
A	C	A	B	C	B	C	C	A	C
21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
C	A	C	C	A	B	B	B	D	D
31	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
B	C	A	B	B	B	B	D	A	C
41	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**
D	A	B	B	A	C	B	A	B	D
51	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
C	B	D	C	C	A	A	C	A	B
61	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**
D	D	A	D	A	B	A	A	B	D
71	**72**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**
C	B	C	A	B	A	D	A	C	B
81	**82**	**83**	**84**	**85**	**86**	**87**	**88**	**89**	**90**
D	B	A	B	B	A	A	C	A	B
91	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**100**
B	A	A	A	A	A	A	D	C	C

7 Economic Geography

1. Which of the following pairs is not correctly matched?
   A. Apiculture – Honey bee
   B. Sericulture – Silk worm
   C. Pisciculture – Lac-insects
   D. Horticulture – Flowers
2. Which one of the following is the largest Canal of the world?
   A. Suez Canal
   B. Panama Canal
   C. Kra Canal
   D. Bhakra Canal
3. Which of the following are connected by Suez Canal?
   A. Red sea and Dead sea
   B. Red sea and Arabian sea
   C. Red sea and Mediterranean sea
   D. Red sea and Black sea
4. Webber's theory of industrial location is based on the premise of:
   A. Minimisation of total cost
   B. Maximisation of profit
   C. Capture of maximum market area
   D. Locational interdependence of firms
5. The Donetz basin is famous for the:
   A. Oil and Oil shale
   B. Coal deposits
   C. Limestone and dolomite
   D. Iron ore
6. Which of the following is not a member of O.E.C.D.?
   A. Japan B. Germany
   C. Canada D. India
7. Flanders industrial region is world renowned for:
   A. Iron-Steel industry
   B. Car manufacturing
   C. Textile manufacturing
   D. Electronics
8. Which country of the world is the largest exporter of cardamom?
   A. Guatemala B. China
   C. Brazil D. Sri Lanka
9. Which is the best combination in descending order of the corn producing countries?
   A. U.S.A, China, Brazil, Argentina
   B. China, U.S.A. France, Brazil
   C. U.S.A., Argentina, China, Yugoslavia
   D. China, Brazil, U.S.A., Argentina
10. Which of the following countries is largely dependent on indigenous iron as well as coal for iron-steel production?
    A. Sweden B. Ukrain
    C. Germany D. Great Britain
11. The concept of isodapane to explain the deviation of plant from the point dictated by minimum transportation cost was advanced by:
    A. A. Weber B. E. Hoover
    C. W. Isard D. A. Loesch
12. The major source of graphite of the world is located in:
    A. China B. Brazil
    C. India D. Philipine
13. The top motor vehicle producer in the world is .....
    A. Japan B. U.S.A.
    C. France D. China
14. Most industrialised country in Asia is:
    A. Philippines
    B. Thailand
    C. Malaysia
    D. Singapore
15. New England states have lost their prominence in textile industry because of:
    A. shortage of electric power
    B. scarcity of water

C. growing cost of labour and raw material
D. Dearth of capital

16. Largest producer of silver in the world is:
A. Mexico B. U.S.A.
C. Laos D. South Africa

17. Hawai Islands are major producer of:
A. Tea B. Sugarbeet
C. Sugarcane D. Wheat

18. Plantation agriculture is most widespread in:
A. Nile Valley
B. Mississippi Valley
C. California
D. Carribeans

19. Grozny is famous for the production of:
A. Petroleum B. Uranium
C. Gold. D. Thorium

20. Fruits and vegetables are grown for export in
A. Israel B. Holland
C. Egypt D. Mauritius

21. The world's largest producer of nitrogenous fertilizer is:
A. China B. U.S.A.
C. Japan D. France

22. The national economy of New Zealand is based on:
A. Export oriented agriculture
B. Heavy industries
C. Tourist industry
D. Electronic industries

23. Commercial grain farming is characteristic of:
A. North China Plains
B. Pampas Plain
C. Volga Basin
D. Danu be Basin

24. The main wheat belt of the U.S.A lies in:
A. The Great Plains
B. The Imperial Valley
C. The Atlantic Sea Bound
D. The tennesee Valley

25. Proceeding from the central city Von Jhunen's theory of agriculture location visualises production of fuel wood in:
A. first ring B. second ring
C. third ring D. fourth ring

26. The largest exporter of tea in the world is:
A. Sri lanka B. India
C. Indonesia D. China

27. The body monitoring international trade is known as:
A. UNESCO B. APEC
C. SAARC D. WTO

28. Pampas and steppes are charcterized as:
A. Mid—latitude grassland
B. Low—latitude grasslands
C. High—latitude grassland
D. Tropical grass lands

29. Which one of the following countries is not a member of G-7?
A. Britain B. China
C. Japan D. Germany

30. COME CON Trade Block consists of:
A. countries of East Europe
B. countries of West Europe
C. countries of North America
D. countries of common-wealth

31. Which one of the following is not correctly matched?
A. South Africa — Velds
B. Australia — Downs
C. Argentina — Pampas
D. Brazil — Steppes

32. The main agricultural producer of Ukrain is:
A. corn B. sun flower
C. wheat D. sugar beet

33. Which of the folloiwng methods is mostly used for mining iron ore, limestone and gravels?
A. Alluvial mining
B. Opencast mining
C. Underground mining
D. All of these

34. Mesabi region of USA is major producer of:
A. Copper B. Coal
C. Iron ore D. Uranium

35. The economy of New Zealand is based on:
A. export oriented agriculture
B. tourist industry
C. heavy industry
D. small scale industry

36. In industrial location theory locational triangle has been used by:
A. Smith B. Weber
C. Palander D. Hoover

37. In agricultural location theory, the concept of an isolated estate was propounded by:
A. Whittlesey B. Farmer
C. Smith D. Von Thunen

38. Which of the following is not correctly matched?
A. Mexixo —— Silver
B. Russia —— Bauxite
C. Bolivia —— Tin
D. U.S.A —— Copper

39. **'Kiel'** canal joins:
A. Baltic sea to Mediterranean Sea
B. Red sea to Mediterranean Sea
C. North Sea to Black Sea
D. None of these

40. Canada is a very important producer of spring wheat because:
1. Here the soil is regur
2. The moisture is obtained from the melting of snow
3. It grows during warm sunny summers
4. The ground is much undulating

Codes:
A. 1 and 2 are correct
B. 2 and 3 are correct
C. 3 and 4 are correct
D. 1 and 4 are correct

41. Which of the following is not a member of the newly formed IOR — ARC?
A. South Africa B. Zimbabwe
C. Yemen D. Madagaskar

42. The largest cocoa producing region in the world is:
A. Brazil Plateau
B. Guinea Coast
C. Malabar Coast
D. Eastern highlands of Africa

43. Kanat system of irrigation is adopted in:
A. U.S.A. B. Western Europe
C. Middle East D. China

44. The country with the largest popualtion in Africa is:
A. Egypt B. Ethiopia
C. Nigeria D. South Africa

45. Match List I with List II and select the correct answer using the code given below the lists:

List I (Industry)	***List II Location***
(a) Iron and Steel	1. Ports mouth
(b) Automobile	2. Sparrow point
(c) Ship Building	3. Tolouse
(d) Aircarft	4. Detroit

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	1	2	3	4
B.	2	1	4	3
C.	4	3	2	1
D.	2	4	1	3

46. Live stock rearing occupies a significant place in:
A. mixed farming
B. intensive subsistence farming
C. plantation agriculture
D. shifting cultivation

47. Which one of the following is the least important for fruit production in California?
A. Educated farmers
B. Mediterranean type of climate
C. Air transport facility
D. Availability of slopy land

48. **Assertion (A):** In Australia cattle rearing is done more for meat than for milk.

Reason (R): Australians are non-vegetarian by tradition.
Select your answer according to the codes:
Codes:
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

49. For which of the following is Kargan da Basin famous?
A. Petroleum B. Coal
C. Manganese D. Iron ore.

50. The forests most suitable from the view point of economic exploitation are:
A. Equatorial. B. Monsoon.
C. Mixed. D. Taiga.

51. Read the following statements:
Assertion (A): Special steal is produced in Ruhr region of Germany.
Reason (R): Iron ore is available from Westphalia region.
Select your answer from the codes:
Codes:
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A

52. The word isodapene is used in:
A. industrial location
B. demarcation of agriculture regions
C. classification of climatic zones
D. classification of vegetation zone

53. Which one of the following is not related to intensive agriculture?
A. Vegetable farming in Netherlands
B. Rice farming in S.E. Asia
C. Wheat farming in Canada
D. Fruit farming in California

54. Which one of the following elements does not held for extensive farming?
A. High yield per hectare
B. High yield per man
C. Large area per farm
D. High income per farm

55. Which one of the following is another name of truck farming?
A. Sericulture
B. Viticulture
C. Fruit farming
D. Market gardening

56. Which one of the following crops is grown on large farms located on the fertile soils of the world for the purpose of feeding animals?
A. Barley B. Oats
C. Rye D. Maize

57. In the Corn Belt of U.S.A large portion of the farmer's income is derived from the sale of:
A. corn
B. wheat and corn
C. beef cattle
D. fresh fruits and vegetables

58. Mixed farming involves:
A. both crops and live stock
B. growing a series of different crops
C. specialised cultivation of vegetables and fruits
D. pooling land voluntarily and managing it jointly under a democratic constitution.

59. Match List I with List II and select the correct answer using the code given below the lists:

List I	***List II***
Major pro. country	***Agri produce***
(a) Egypt	1. Coffee
(b) Brazil	2. Cotton
(c) Nigeria	3. Diamond
(d) South Africa	4. Tea.

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	2	1	4	3
B.	4	1	2	3
C.	1	2	3	4
D.	2	3	4	5

60. Which one of the following pairs is not correctly matched?
A. Val paraiso — Brazil

B. Texas — U.S.A.
C. Witwatersrand — South Africa
D. Harare — Zimbabwe

61. Which of the following industries is prominent at Kiel?
A. Automobiles B. Iron-steel
C. Ship-building D. Textiles

62. Which one of the following is not correctly matched?
A. Akron — Synthetic rubber
B. Osaka — Ship-building
C. Magnitogorsk — Iron steel
D. Baku — Oil refinery

63. Which one of the following iron mining centres does not belong to the lake superior iron ore regions?
A. Gogebic B. Mesabi
C. Vermilion D. Krivoirog

64. Find out the correct match:

Commodity		***Leading producer of World***
A. Wheat	—	China
B. Steel	—	U.S.A.
C. Bauxite	—	Guinea
D. Paper	—	Canada

65. Which of the following states of Australia is a major producer of coal?
A. New South Wales
B. Northern territory
C. Queens land
D. Victoria

66. Which type of activity is road construction?
A. Primary B. Secondary
C. Tertiary D. Quaternary

67. The leading exporter of Rice in the world is:
A. Pakistan B. U.S.A.
C. Thailand D. Vietnam

68. Watershed management involves:
A. building large dams on rivers
B. constructing barrages on rivers
C. erecting dykes on streams
D. constructing network of canals

69. Which of the following minerals is classified as ferro alloy?
A. Bauxite B. Molybdenum
C. Tin D. Uranium

70. **Assertion (A):** France in European union exports over 70,000 million Kwh of electricity annually.
Reason (R): France is the largest producer of hydro-electricity in European union.
Find out the correct answer from the code below :
Codes:
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

71. Which of the following petroleum producing countries is not a member of the OPEC?
A. Indonesia B. Iran
C. Norway D. Venezuela

72. Identify the correct descending order of countries producing iron ore:
A. China, Brazil, Australia, Russian Federation
B. China, Australia, Brazil, India
C. Australia, Brazil, China, U.S.A.
D. Russian Federation, China, Brazil Australia

73. Which of the following is a source of primary electricity generation?
A. Coal B. Petroleum
C. Natural gas D. Wind

74. The largest producer of uranium in the world is:
A. Port Radium in Canada
B. Radio Hill in Australia
C. Sinkolowbe in Central African Republic
D. Angerica in Portugal

75. Silicon valley is famous for:
A. Computer chips
B. Silica production

C. Headquarters of Coca-Cola
D. Chemicals

76. The famous corn belt of the U.S.A is located in its:
A. North-eastern part
B. North-western part
C. South central part
D. South-western part

77. Which of the following countries of Africa has no rail route?
A. Chad B. Tanzania
C. Zambia D. Zimbabwe

78. Which one of the following countries is not a member of any of the world's formal trade blocks?
A. Mexico B. France
C. Indonesia D. Japan

79. Kanal irrigation system is prevalent in:
A. Khirgizstan B. Iran
C. Egypt D. Greece

80. Which of the following countries is designated as one of the Asian tigers?
A. Japan
B. Malaysia
C. Korean Republic
D. Philippines

81. Match List I with List II and select the correct answer using the code given below the lists:

List I (Ecosystem)	***List II (Vegetation type)***
(a) Tropical grassland	1. Selvas
(b) Temperate forests	2. Taiga
(c) Tropical forests	3. Savana
(d) Temperate grasslands	4. Pampas

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	3	2	1	4
B.	1	2	3	4
C.	4	3	2	1
D.	2	1	4	3

82. Yerba mate is a stimulating beverage of:
A. Panama B. Saudi Arabia
C. Brazil D. New Guinea

83. Fazendas are associated with:
A. Cattle ranching
B. Rubber plantation
C. Dairying
D. Commercial grain faming

84. Which one of the following iron and steel producing areas of U.S.A. illustrates break point location?
A. Pitsburg region
B. Atlantic sea board region
C. Lake Erie region
D. Alabama region

85. Consider the following statements:
Assertion (A): Most of the raising of the U.S.A. are produced in the Fresno region of California.
Reason (R): Nearly eighty percent of the grapevines of California are irrigated.
Select the correct answer using the code given below:
Codes:
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

86. In which of the following country is main producer of wind power?
A. Japan B. China
C. Russia D. USA

87. Which one of following crops is grown in areas having 200 frost-free days, 500-1000 mm. rain and 20°C temprature?
A. Jute B. Cotton
C. Wheat D. Rice

88. Ras tanura oil refinery is located along the:
A. Eastern coast of Saudi Arabia
B. Western coast of Saudi Arabia
C. North-eastern coast of Saudi Arabia
D. North-western coast of Saudi Arabia

89. Which one of the following scholars has divided the world into major agricultural regions?
A. Kosowicki B. Von Thunen
C. Weaver D. Whittlesey

90. To which one of the following categories the agricultural land belongs to a resource?
A. Commonalities B. Rarities
C. Ubiquities D. Uniquities

91. Which of the following two countries are connected through the oriental express railway?
A. China and Mongolia
B. France and Turkey
C. Myanmar and Thailand
D. Poland and Ukraine

92. Ladang is a migratory system of agriculture in:
A. Africa B. Malaysia
C. Central India D. South America

93. In which one of the following countries are Fenlands found
A. U.S.A B. France
C. New Zealand D. England

94. In the concentric zone theory the zone II is:
A. Residential zone
B. Workingmen zone
C. Commuter zone
D. Business zone

95. Savanna grass lands in Brazil are called:
A. Campos B. Powns
C. Pampas D. Prairies

96. The two sea ports on either ends of the Suez Canal are:
1. Alexandria 2. Cairo
3. Port Said 4. Suez
A. 1 and 2 B. 3 and 4
C. 2 and 3 D. 2 and 4

97. Which one of the following countries of Africa is the largest producer of copper?
A. Union of South Africa
B. Congo
C. Kenya
D. Tanzania

98. Which one of the following statements about the great plains of the U.S.A is not correct?
A. They have a cover of high grade short grasses.
B. They are the most extensive grazing lands.
C. They are largely not suitable for cultivation because of low and erratic rainfall.
D. They are akin to the Great Australian Desert.

99. Which of the following sequence of vegetation on zones would be noticed while travelling from the equator to the North Pole?
A. Evergreen, Deciduous, Prairie, coniferous
B. Deciduous, Evergreen, coniferous, prairie
C. Prairie, evergreen deciduous, coniferous
D. Coniferous, Deciduous, Prairie, evergreen

100. The world's longest under sea tunnel connects:
A. China and Hainan Island
B. China and Hongkong
C. Hokkaido and Honshu
D. Malya Peninsula and Sumatra

101. Match List I with List II and select the correct answer using the code given below: the lists:

List I	***List II***
(a) Pittsburg	1. Iron-steel
(b) Chicago	2. Paper Pulp
(c) Quebec	3. Motor car
(d) Detroit	4. Agricultural machinery

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	1	2	3	4
B.	1	4	2	3
C.	2	4	3	2
D.	4	1	2	3

102. Which one of the following is a tropical grassland?
A. Lanos B. Prairie
C. Steppe D. Weld

103. Which one is wrongly matched?
A. Osaka : Cotton textile
B. Milan : Silk
C. Windsor : Automobiles
D. Chicago : Flour mills

104. Which among of the folloiwng is the major industry in Pittsburg?
A. Meat packing
B. Flour packing
C. Iron and steel industry
D. Textile industry

ANSWER

1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
C	D	C	A	B	D	C	A	A	C
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
A	A	D	D	C	A	C	D	A	A
21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
A	A	B	A	B	D	D	A	B	A
31	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
D	A	B	C	A	B	D	C	C	B
41	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**
B	B	C	C	D	A	C	A	B	D
51	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
D	A	C	A	D	D	C	A	A	A
61	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**
C	B	D	A	A	C	C	C	B	D
71	**72**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**
C	B	A	A	A	C	A	D	B	C
81	**82**	**83**	**84**	**85**	**86**	**87**	**88**	**89**	**90**
A	C	B	D	A	B	B	C	D	A
91	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**100**
B	B	D	A	A	B	B	D	A	C
101	**102**	**103**	**104**						
B	A	D	C						

8 Cartography

1. In which projection the distribution of wheat production in the world can be better shown?
   A. Mercator's B. Bonne's
   C. Molle weide's D. Gnomonic

2. If the distance on the map between A and B is 7 cm. and the R.F of the map is 1: 3,25,000 then what will be the distance between the two places?
   A. 18.60 km. B. 21.50 km.
   C. 22.75 km. D. 26.25 km.

3. Match List I with List II and select the correct answer using the code given below the lists:

List I (Proejections)	***List II (Chief Characteristics)***
(a) International	1. Equal area
(b) Molle weide	2. True direction
(c) Mercator	3. True Scale
(d) Gall's	4. None

Code:

	(a)	*(b)*	*(c)*	*(d)*
A.	3	2	4	1
B.	3	1	2	4
C.	2	4	3	1
D.	1	2	4	3

4. The following symbol in a geological map indicates



   A. undulating strata
   B. syncline
   C. horizontal starta
   D. vertical strata

5. **Assertion (A):** All meridians are great circle.
   Reason (R): The great circle divides the earth sphere into two equal parts.
   A. Both A and R are true and R is the the correct explanation of A
   B. Both A and R are true but R is not correct explanation of A
   C. A is true but R is false
   D. A is false but R is true

6. The length of equator is not correctly shown on:
   A. Cylindrical equal area projection
   B. Mercator's projection
   C. Molle weide projection
   D. Sinusoidal projection

7. The weather map of India is drawn on:
   A. Bonne's projection
   B. Polly conic projection
   C. Mercator's projection
   D. International projection

8. Which of the following properties are true for Bonne's projection? Select the correct answer from the code given below:
   1. It is an equal area projection.
   2. It's parallels are concentric curves.
   3. Only the central meridian is a straight line.

   Codes:
   A. Only 1 and 2 are correct
   B. Only 1 and 3 are correct
   C. Only 2 and 3 are correct
   D. 1, 2 and 3 are correct

9. In a map 1 c.m. represents 10 km. Its R.F. is:
   A. 1/100,000 B. 1/1,000,000
   C. 1/10,000 D. 1/1000

10. In a prismatic compass survey bearings are measured with reference to:
    A. Geographic north
    B. Grid north

C. Magnetic north
D. Assumed north

11. All parallels are standard parallels on the:
A. Cylindrical equal area projection
B. Mercator's projection
C. Molleweide projection
D. Sinusoidal projection.

12. Loxodrome is related to:
A. Cylindrical projection
B. Mercator projection
C. Molleweide projection
D. Bonne projection

13. The curve drawn to represent total area of land above each contour line as a percentage of the total map area is known as:
A. Area height curve
B. Altimetric frequency curve
C. Clinographic curve
D. Hypsometric curve

14. Which one of the following is not depicted on the daily Indian weather map?
A. Temperature B. Cloud
C. Rainfall D. Wind

15. Match List I with List II and select the correct answer using the code given below the lists:

List I (Index Number of Topo Sheets)	***List II (Scale of the Topo Sheets)***
(a) 63	1. 1" to a mile
(b) 63 K	2. 1" to 16 miles
(c) 63K/15	3. ½" to a mile
(d) 63K/NE	4. Quarter inch to a mile.

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	1	2	3	4
B.	2	4	1	3
C.	3	4	2	1
D.	4	3	1	2

16. Which one of the following is a large scale map?
A. An Atlas map
B. Wall map
C. Topographical map
D. Cadastrol map

17. International projection is the modified version of:
A. Polyconic
B. Bonne's
C. Sinusoidal
D. Simple Conical with two standard parallels

18. Which projection is the most appropriate for defecting Trans Siberian railway?
A. Mercator projection
B. Simple conical with two standard parallel
C. Cylindrical equal area projection
D. Polar Zenithal gnomonic

19. The proportion of the area of the surface at various elevations above or depths below a given datum is properly represented by:
A. Hypsometric curve
B. Lorentz curve
C. S. curve
D. Frequency curve

20. Which one of the following is the most suitable method for representing the constituents as well as the sum total over a consecutive period of time?
A. Band graph
B. Compound bar diagram
C. Multiple line graph
D. Wheel diagram

21. Which of the following pairs is not correctly matched?

List I Projection	***List II Use***
(a) Mercator	1. Navigation
(b) Mollweide	2. World Distribution
(c) Gnomonic	3. Area measurement
(d) International	4. Topographical map

22. Which one of the following is the most suitable for the depiction of distribution of rural population on a map?
A. Dot method B. Shade method
C. Circle method D. Spehere method

23. The most suitable map projection for the map of Uttar Pradesh is:
A. Bonne's projection.

B. International projection
C. Interrupted sinusoidal projection
D. Mollweide projection

24. The weather map of India does not show:
A. Cloudiness B. Wind direction
C. Isobars D. Isotherms

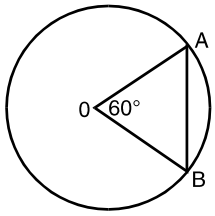
25. Which one of the following projection is a non-perspective projection?
A. Zenithal Gnomonic
B. Zenithal Streographic
C. Zenithal equidistant
D. Zenithal orthomorphic

26. The name of map projection where in a portion of the globe is projected upon a plane tangent to it is:
A. Polyconic projection
B. Zenithal projection
C. Cylindrical projection
D. Globular projection

27. Which one of the following scales is suitable for drawing town guide maps?
A. 1: 20,000 B. 1: 50,000
C. 1: 63,360 D. 1: 1,000,000

28. The most consistent measure of nodal accessibility is:
A. T matrix B. Valued matrix
C. Graded matrix D. Morpho-matrix

29. In the circle '0' is the centre. It AB = 10 the area of the circle is:



A. 10 π B. 25 π
C. 50 π D. 100 π

30. The scale of 1: 10 million can represent the real globe by a sphere with a diameter of:
A. 63.5 c.m. B. 75.0 c.m.
C. 127.0 c.m. D. 150 c.m.

31. Ergograph was designed by:
A. G. P. Kellaway
B. K. P. Dhurandhar
C. E Raise
D. A. Geddes

32. On which of the following map projections the Great circle is shown as a straight line?
A. Cylindrical equal area
B. Bonne
C. Mercator
D. Polar Gnomonic streographic

33. Using the following code select the correct properties on sinusoidal projection.
1. Area will be correct
2. Shape will be correct
3. Direction will be correct
4. Shape will be distorted

Codes:
A. 1 and 2 B. 2 and 3
C. 1 and 4 D. 3 and 4

34. Which of the following symbols is used for overcast sky by high clouds?
A.  B. 
C.  D. 

35. Which of the following diagram is the best suited for depictiny soil classification?
A. Bar diagram
B. Circle diagram
C. Triangular graph
D. Circular graph

36. **Assertion (A):** A map is a true representation of the earth's surface pattern.
Reason (R): It is drawn to scale.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

37. Who was the pioneer in the use of map projection?
A. Cassini B. Adrisi
C. Mercator D. Ptolemy

38. A graph in which means monthly temperature is plotted against the monthly rainfall is known as:
A. Hythergraph B. Climograph
C. Ergograph D. Hypsograph

39. For showing the intensity of cropping in different districts of a state which of the following maps will be most suited?
A. Isopleths map
B. Choropleth map
C. Chorochromatic map
D. All of these

40. "Dot method" is used for showing:
A. Distribution of crops on the field
B. Distribution of population on the map
C. Distribution of mineral and means of power
D. None of these

41. What is the least count of a diagonal scale if secondary and 10 diagonal division?
A. 5 c.m. B. 10.cm.
C. 15 c.m. D. 20 c.m.

42. Match List I with List II and select the correct answer by using the code given below the lists:

List I (Books)		***List II (Authors)***
(a) Block diagram	1.	Mon Khouse and Wilkinson
(b) Map projection	2.	Robinson
(c) Elements of Cartogrpahy	3.	Kellaway
(d) Maps and Diagrams	4.	Lobeck

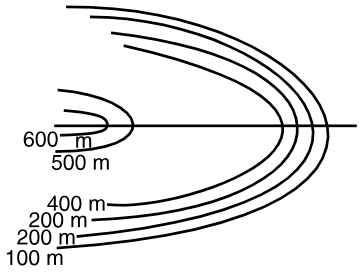
Codes:

(a)	*(b)*	*(c)*	*(d)*
A. 4	3	1	2
B. 4	3	2	1
C. 1	4	2	3
D. 4	2	3	1

43. The first detailed map of India was prepared by:
A. P. Anville B. Eratosthenes
C. Ptolemy D. James Rennel

44. When on a map one c.m. represents 2 kms., the R. F. is?
A. 1/20,000 B. 1/40,000
C. 1/80,000 D. 1/200,000

45. In the map the contours represent:



A. Concave slope B. Uniform slope
C. Convex slope D. Undulating slope

46. Cartography includes the whole series of map making from an actual survey of the ground to printing of the map. This definition is given by:
A. Robinson B. Raisz
C. Monk house D. Kellaway

47. Match List I with List II and select the correct answer using the code given below the lists:

List I (Books)		***List II (Authors)***
(a) Elements of cartogrpahy	1.	By gott
(b) An introduction of the study of map projections	2.	Bowyer
(c) A guide to map projection	3.	Steers
(d) An Introduction to map work and practical Geography	4.	Robinson

Codes:

(a)	*(b)*	*(c)*	*(d)*
A. 4	3	2	1
B. 1	2	3	4
C. 4	1	2	3
D. 1	3	4	2

48. The age-sex composition of population is the best represented by:
A. Simple bar diagram
B. Compound bar diagram

C. Pyramidal diagram
D. Multiple linegraph

49. Which of the following has no match?
A. Shower ∇ B. Hail ▲
C. Sand storm ⇜ D. Fog ≡

50. Which one of the following statements about sinusoidal projection is not true?
A. It is an equal - area projection
B. The scale is correct on all the parallels
C. The scale is correct on all the meridians
D. Shape is distorted away from the central meridian

51. The interval of 1° latitude measures:
A. 211 kilometers B. 11 kilometers
C. 91 kilometers D. 241 kilometers

52. Which one of the following is the most suitable map projection for showing the world distribution of rice cultivation?
A. Bonne projection
B. Cylindrical equal area projection
C. Mollweide projection
D. Simple cylindrical projection

53. The weather map of India is drawn on:
A. Bonne projection
B. Polyconic projection
C. Mercator projection
D. Molleweide projection

54. Match List I with List II and select the correct answer using the code given below the lists:

List I	***List II***
(a) Chorochromatic map	1. Atlas map on a very small scale.
(b) Choroschematic map	2. Different objects are shown by diff-rent colour.
(c) Choropleth map	3. Distribution of objects by vari-ous symbols.
(d) Chorographical map	4. Different shading by horizontal and vertical lines.

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	1	2	3	4
B.	2	3	4	1
C.	4	3	2	1
D.	4	3	3	1

55. A twelve -sided figure showing the average monthly temperature and rainfall condi-tions at a particular station is known as:
A. Thermograph B. Hythergraph
C. Climograph D. Ergograph

56. Which of the following projection is suitable to show cape-cairo rail route?
A. Mercator B. Polyconic
C. Bonne D. Sinusoidal

57. Which one of the following is not correctly matched?
A. Graveyard
B. Mine
C. Permanent Hut
D. Spring X

58. When the R.F. = 1/80,000, one c.m. represents:
A. 80 metres B. 800 metres
C. 4,000 metres D. 8,000 metres

59. What is the least count of a diagonal scale if its one primary division, measuring 10 m, has been divided into 10 secondary and 10 diagonal divisions?
A. 5 cm. B. 10 cm.
C. 15 cm. D. 20 cm.

60. Match the following pairs of cultural features and symbols, and select the correct answer from the given code:

Cultural features	***Symbols***
(a) Lined well	1.
(b) Unlined well	2.
(c) Graveyard	3.
(d) Fort	4.

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	1	2	3	4
B.	2	1	4	3
C.	3	1	4	2
D.	3	1	2	4

61. Which one of the following is not correctly matched?
A. Fog ≡
B. Mist =
C. Rain
D. Thunderstorm

62. What are the advantages of mapping and monitoring of natural resources using satellite remote sensing techniques?
A. Satellite data provide a synoptic view over a wide areas coverage
B. Satellite data can be acquired of any geographical area repeating at regular intervals
C. It represents an unbiased record
D. All of these

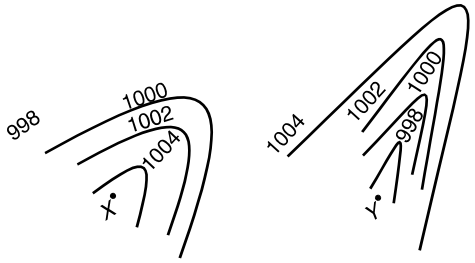
63. Cadastral maps are meant for:
A. Showing the boundaries of fields and buildings
B. Distribution of crops
C. Showing urban areas
D. Relief and drainage

64. International projection is a modified from of:
A. Cylindrical equal area projection
B. Sinusoidal projection
C. Polyconic projection
D. Bonne's projection

65. Pie diagram is best example for representation of:
A. Land use
B. Distribution of population
C. Spot heights
D. crop production

66. The ergograph shows the relationship between:
A. temperature and rainfall
B. temperature and rainfall
C. climate and growing season of crops
D. Wet bulb temperature and humidity

67. Which one of the following statements about *x* and *y* marked on the Isobaric sketch-map given below is correct?



A. Both *x* and *y* are located in v-shaped depressions
B. Both *x* and *y* are located in wedge areas
C. *x* is located in V-shaped depression and *y* in wedge area
D. *x* is located in wedge area and *y* in V-shaped depressions

68. Proportional compasses are used in the:
A. measurement of flat land
B. reduction and elargement of maps
C. Measurement of undulating land
D. Measurement of Mountains

69. The lines showing the depth of the sea bed are called:
A. Isobars B. Isobaths
C. Contours D. Cliff

70. The science of constructing maps and charts, it includes the making of original survey. Selection of suitable map projections and decision of colours, layer and other visual representation is called:
A. Cartography
B. Topography
C. Techniques of map constructing
D. All of these

71. Vellums are:
A. Equipment used in measurement of an area
B. Equipments used in surveying
C. Plastic media
D. Semi transparent papers to be used for colour maps

72. The standard colour for forest is:
A. Yellow B. Light green
C. Brown D. Dark green

73. The standard colour for grass lands is:
A. Dark brown B. Dark green
C. Light green D. Blue

74. The length of a Guntar chain is:
A. 76 feet B. 100 feet
C. 66 feet D. 56 feet

75. The standard colour for cultivated area on the map is:
A. Brown B. Yellow
C. Light green D. Dark green

76. In order to adopt to metric system our country uses chains of:
A. 30 mts. and 15 mts.
B. 20 mts. and 10 mts.
C. 30 mts. and 60 mts.
B. 20 mts. and 40 mts.

77. In the setting of a map, the north point should correspond to:
A. the North Pole
B. the magnetic north
C. the true north
D. none of these

78. Wall maps are:
A. small scale maps
B. large scale maps
C. large scale maps with inter polations
D. small scale maps intended to convey the main feature in bold manner

79. Topographic maps are:
A. large-scale maps
B. small-scale maps
C. intermediate between small scale and large-scale maps
D. none of the above

80. Which among the following is a common scale of topographic maps or topo sheets?
A. 1:62,500 B. 1:40,000
C. 1:30,000 D. 1:20,000

81. Drawing contours, with the help of spot height given on the map is known as:
A. Interpretation of contours
B. Interpolation of contours
C. Intermission of contours
D. None of these

82. Pantogrpah is used for:
A. reduction of maps only
B. enlargement of maps only
C. enlargement for reduction of maps with accuracy
D. recording map's direction

83. Ranging Rod, isused in:
A. map making
B. shading
C. measurement of an area
D. surveying

84. A diagram showing the frequency and direction of wind is known as:
A. Wind vane
B. Wind Rose
C. Frequency diagram
D. None of these

85. A narrow elevated tract of ground separating water flowing in opposite directions is known as:
A. Lagoon B. Archipelago
C. Watershed D. Landscape

86. Relief features on the topographic map can be shown by:
A. circles B. Hachures
C. Contours D. Layer colouring

87. The amount of rainfall of a given place over a fixed duration can be measured by
A. Rain Rod B. Rain Rose
C. Rain Vane D. Rain Guage

88. Cadastral maps are
A. Topographical maps
B. Large scale maps
C. Medium scale maps
D. Small scale maps

89. The instrument to measure area on a map is known as:
A. planimeter B. Opisometer
C. Bonnemeter D. Both A and B

90. The instrument to measure distance on a map is called:
A. Planimeter B. Opisometer
C. Hygrometer D. Pantometer

91. A drainage pattern can be shown on:
A. Mercator projection
B. Cylindrical projection
C. Azimuthal projection
D. None of the above

92. Which of the following is a characteristic of simple cylindrical projection?
A. All parallels are equal to the equator and all meridians are half of the equator in length
B. It is also known as Azimuthal projection
C. It is also known as mercator projection

D. The pole is projected as an area of a circle

93. Parallels and meridians are spaced at equal intervals is a characteristic of:
A. Parallel projection
B. Mercator projection
C. Azimuthal projection
D. Simple cylindrical projection

94. Azimuthal projections are:
A. Mercator projection
B. False bearing projection
C. True bearing projection
D. All of the above

95. In flow maps the flow or movement of people and commodities is represented by:
A. Ribands B. Suitable scale
C. Circles D. Contours

96. Spacing of contour lines is supposed to indicate:
A. Land use B. Settlement
C. Amount of Slope D. Direction of Slope

97. Aerial photography is:
A. Two dimensional optical model of the terrain
B. One dimensional optical model of the terrain
C. Three dimensional optical model of the terrain
D. All of these

98. Automatic recording of pressure can be done by
A. Barometer
B. Pressometer
C. Hygrometer
D. None of the above

99. Wind direction can be found out by:
A. Wind vane B. Hygrometer
C. Barometer D. Anemometer

100. Ergograph was devised by:
A. Geddes B. Kellaway
C. Mercator D. Rait

ANSWER

1	2	3	4	5	6	7	8	9	10
C	C	B	A	A	C	B	D	B	C
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
D	B	D	A	B	D	A	B	A	B
21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
C	A	A	D	C	B	A	A	D	C
31	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
D	C	C	D	C	D	D	A	B	B
41	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**
B	B	C	D	C	C	C	C	C	C
51	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
B	B	B	B	B	D	D	B	B	C
61	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**
C	D	A	C	A	C	D	B	B	A
71	**72**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**
D	D	C	C	B	A	C	A	C	A
81	**82**	**83**	**84**	**85**	**86**	**87**	**88**	**89**	**90**
B	C	D	B	C	C	D	B	A	A
91	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**100**
A	A	D	C	A	D	C	A	D	A

9 Biogeography

1. The factors which contribute to the greater amount of soil erosion or soil impoverishment is:
   A. Multiple cropping
   B. Monoculture
   C. Overgrazing
   D. All of these
2. Leaching is the process by which:
   A. the lands are sprayed with fine ones
   B. course soil particles are broken into fine ones
   C. the soil fertility is lost
   D. fertile soluble part of the soil is dissolved and carried away by water
3. Which soil contains maximum amount of organic matter?
   A. Laterite B. Mountain
   C. Podzol D. Chernozem
4. A soil type contains 50 to 70 percent sand and 10 to 20 percent caly is called:
   A. Sandy loam
   B. Clayey loam
   C. Silty loam
   D. Red soil
5. The property of some desert soils have been influenced primarily by high soil temperature as a dominant soil forming factor, such soils are also known as:
   A. Xeromorphic soil
   B. Halomorphic soil
   C. Thermogenic soil
   D. None of these
6. Where evaporation is the dominant process and where the sporadic rainfall has been in sufficient to reach the soluble salts in the soils then it forms?
   A. Podzols B. Alkaline
   C. Acidic D. Laterite
7. The black cotton soil contains:
   A. Small cell particles
   B. Compounds of iron and aluminium
   C. Barium salts
   D. Compound of iron and manganese
8. Regosols are:
   A. Recently exposed rock surfaces
   B. Site with excessive water supply
   C. Recent calcareous alluvium
   D. Earthy top soil
9. Soil that is a mixture principally of Kaolin hydratedoxides and Quartz is known as:
   A. Oxisol B. Spodosol
   C. Vertisol D. Histosol
10. Soils found under cold climates which inhibit bacterial action.
   A. Terra Rosa B. Podzol
   C. Chernozem D. Regosols
11. Which of the following is an important soil of the equatorial region?
   A. Laterite B. Alluvial
   C. Red soil D. Podzol
12. A special type of soil which yields a characteristic sticky mud when wet is:
   A. Gumbo B. Chesnut
   C. Prairie D. Bog
13. The soils of peninsular India have been formed by:
   A. deposition of alluvium
   B. erosion and deposition
   C. weathering and marginal displacement
   D. weathering and gradation
14. Texture of clayey soil is fine gained and the particles are have a diameter.
   A. 1 mm B. 2 mm
   C. 1-3 mm D. 0.15-2 mm

15. Lateritic soil are found in:
A. Meghalaya B. Asom
C. Kerala D. All of above

16. With the increasing acidity of soil, the water stability of the aggregates decreases because of:
A. Translocation
B. Deflocculation
C. Mineralisation of humid acids
D. Both B and C

17. The capacity of a soil to retain water depends on:
A. Texture
B. Structure
C. Colour
D. Horizon development

18. The A and B horizons together are referred to as:
A. Top soil
B. True soil
C. Sub soil
D. Top horizon

19. Porosity is the greatest in:
A. Shale B. Gravel
C. Clay D. Sandstone

20. The ability of rock to allow liquids to enter is called:
A. Aeration B. Permeability
C. Capillarity D. Solubility

21. Which of the following factors helps in soil formation?
A. Time factor
B. Climatic factor
C. Topograhic of the region
D. All of these

22. A good soil is one which:
A. allow limited amount of water
B. allows to percolate the water slowly form it
C. allow to pass water very quickly
D. holds the whole water entering into it

23. The colour of the soil depends on:
A. composition
B. drainage system and age
C. vegetation of that area
D. Both A and C

24. What is the name given to a hard layer of calcium and magnesium compounds found in the subsurface zone of the calcimorphic soils?
A. A hard pan
B. A concretion layer
C. A peaty layer
D. A pebble horizon

25. Fluviation is a process of:
A. Accumulation of colloids
B. Accumulation of hydroxides
C. Accumulation of soluble minerals in lower soil layers
D. Removal of soluble minerals from upper soil layers

26. Humus can be best defined as:
A. fully decomposed organic matter
B. leaves and twigs of plants
C. partly decomposed organic matter
D. living organic matter

27. Texture of the soil implies:
A. particle size
B. arrangement of particles
C. moisture content of soil
D. colour of the soil

28. Where is the Gulf of Mannar located?
A. West of Gujarat
B. East of Tamil Nadu
C. West of Kerala
D. South of Kanyakumari

29. The approximate pH value of an acidic soil is:
A. below 7 B. above 7
C. about 10 D. about 13

30. Permeability of a soil is a function of its:
1. porosity 2. structure
3. depth colour
Codes:
A. 1 and 3 B. 1, 2 and 3
C. 2 and 3 D. 1 and 2.

31. Leaching is a process of:
A. removal of organic matter
B. changes through organismic activity
C. removal of debris by streams etc.
D. removal of soluble matter by percolating water

32. The process of podzolization occurs typically in:
A. Tropical monsson regions
B. Chapparal region
C. Temperate deciduous forest
D. Coniferous forests

33. pH of a soil indicates:
A. its fertility
B. its maturity
C. its age
D. its chemical reaction

34. Alluvial soils form in areas of:
A. stream deposition
B. high temperature and low humidity
C. wind erosion and deposition
D. limestone regions

35. Which of the following term is used for artificially formed soil mass?
A. Ped B. Clod
C. Concentration D. Pedon

36. The smallest volume that can be called soil or smallest three dimensional soil unit which can represent the nature and arrangements of horizon is:
A. Pedocals B. Pedon
C. Yeralfs D. Ustalfs

37. Results when trubulent water causes soil particles to seep or skip as they move downward
A. Vaultation/saltation
B. suspension
C. Surface creep
D. None of the above

38. Soil is inherently a multiphase system consisting of a mineral phase called the.....plus a fluid phase called.....respectively.
A. Mineral skeleton, Pore fluid
B. Pore fluid, Mineral skeleton
C. Agpian, Spring tail
D. None of the above

39. Desalination that is carried out in arid regions basically means:
A. removal of sodium by chemical means
B. flash distillation process
C. Removal of salt from soil to make it agriculturally productive
D. Removal of salt from water tomake it of a suitable quality for industrial and domestic use

40. Which of the following is not a charcateristic of black soil or regur?
A. It is the most fertile soil
B. It is generally clayey and impermeable
C. It lacks in phosphorous, nitrogen and organic matters
D. Lime potash and iron are essential constituent of black soil

41. Khadar is the name given to the:
A. swampy land of deltas
B. black soil of trap region
C. lowland alluvial soil
D. upland alluvial soil

42. Podzols refer to:
A. soils of coniferous forest
B. soils found in dry regions
C. a very fertile river alluvium
D. soils with very fertile A-Horizon

43. The soils of the tropical rainy land are known as:
A. Podzols
B. Chernozem
C. Laterites
D. Pedalfers

44. Identify the soil which occurs under decidiuous woodland or grassland in the world's humid area where there is some leaching and alluviation with some colour changes.
A. Affisol B. Podzol
C. Aridosol D. Oxisols

45. The soil which is characterised by a very high organic content in its upper horizon

and by its high degree of water loggin occupied in cool humid climatic regions is:
A. Xeralfs B. Udalfs
C. Histosols D. Alfisols

46. In the tundra region the top soil is:
A. always frost free
B. free of frost for six months in the year
C. frost free for 3 months in the year
D. never gets frost free

47. The improper use of land:
A. renders land useless for ever
B. pollutes the environment:
C. causes nutisance to the people
D. increases cost of maintenance

48. As the water continues to carry away the top soil the productivity of land:
A. Decreases
B. Increases
C. Remains constant
D. Sometimes increased and on the other decreases

49. The process of removal of ca++ (calcium ion) from the soil either by biological or chemical mechanism is called the process of
A. Laterisation B. Nitrification
C. De calcification D. Rendzina

51. Soil erosion is always enhanced when the cleared area of land is on the steep slope. Thus soil erosion can be stopped by:
A. Contour Ploughing
B. Terracing
C. Strip Cropping
D. All of these

52. Which of the following methods help us conserve soil affected by overgrazing?
A. Scientific grazing
B. Strip cropping
C. Contour ploughing
D. Bunding

53. On slopy land, soil erosion is often minimised by which of the following methods?
A. Terracing
B. Subsoiling
C. Contour bunding
D. Basin Listing
E. Both A and C

54. The use of Ammonium Sulphate and Ammonium Nitrate:
A. decreases soil acidity
B. increasing soil acidity
C. remains same soil acidity
D. none of these are correct

55. The advantages of crop rotation are:
1. a varied range of crops is provided
2. this type of system is quite cheap
3. attacked by insects and fungi is minimized
4. weeds are kept down
5. many crops produce mineral residues at their root tips which may be harmful to themselves but not to the other crops

Codes:
A. 1 and 2 are correct
B. 1, 2, 3 and 4 are correct
C. 1, 3 4, and 5 are correct
D. All are correct

56. A region which has a long cold winter and a short-cool summer and whose subsoil are frozen for most of the year will have natural vegetation of:
A. Lichen and sedge
B. Sage bush and cacti
C. Acacia and sal
D. Macquis and low scrub

57. The temperate grasslands of the interior of Eurasia are called:
A. Veldt B. Steppe
C. Prairie D. Downs

58. A forest whose broad-leafed evergreen trees grow to great heights and which are testooned with parasitic plants and emphytes and beneath which the under growth is verysparse is known as:
A. Equatorial forest
B. Temperate evergreen forest
C. Coniferous forest
D. Mediterranean forest

59. All of the following are essential to the proper growth of green plants except.
A. water
B. sunlight
C. high humidity
D. high temperatures

60. Cork-oak is found in.....type of vegetation:
A. Mediterranean B. Monsoon
C. Tundra D. Desert

61. The typical vegetation of the desert region is:
A. thorny bushes and deep rooted plants
B. scattered trees with tall grasses
C. epiphytes and parasitic plants
D. none of these

62. Treeless grassland are called:
A. Steppes B. Campos
C. Lanos D. Savanna

63. Arrange the following incorrect order from high moisture to low moisture region:
1. Grassland savanna
2. Woodland savanna
3. Scrub savanna
4. Desert savanna

Codes:
A. 1, 2, 3, 4 B. 2, 1, 3, 4
C. 4, 1, 2, 3 D. 2, 1, 4, 3

64. A plant that grows only in a mountainous environment is called:
A. Orophytes C. Altiphyte
B. Acrephyte D. None of these

65. The scruby vegetation type called mulga, composed largely of spiny Acacia is found in:
A. Central Australia B. Chile
C. California D. All of these

66. A climbing vine like plant with a woody stem that entwines itself around forest trees in tropical rainforest and equatorial rain forests and which is strong enough to be used as rope is called:
A. Epiphytes B. Lianas
C. Stiff plants D. All of the above

67. The semi-arid scrub vegetation mainly of Acacia in Australia is called:
A. Mulga B. Mallee
C. Chapparal D. Brigalow scrub

68. The plant which tolerates and flourishes on acid soil is called:
A. Acidophile B. Hydrophile
C. Crosere D. None of the above

69. The equatorial forests present problems in the exploitation:
A. Trees are not found in pure stands
B. They have hardwood trees which are not useful for the manufacture of paper and pulp
C. The dense impenetrable forest makes transport difficult
D. All the above reasons

70. Coniferous forests are evergreen because:
A. a large number of species in the forests shed their leaves at different times of the year
B. precipitation is both in the form of rain and snow
C. trees do not shed all their leaves together during a specific period of time, but have a continuous process of shedding leaves and getting new ones
D. All of the above

71. A geographical area supporting a distinctive plant or animal life specially in forest, grassland, savannah and desert is called:
A. Fragipan B. Frazil
C. Duripan D. Biochore

72. A plant which adopts alternative growth pattern actingas xerosere in dry season and hydrosere in wet season is known as:
A. Tropophytes B. Prteidophytes
C. Halophytes D. Saprosere

73. The slow replacement of one group of plant community in a particular vegetation zone by another group over lengthy period of time because of climatic change is called:

A. Clisere
B. Hydrosphere
C. Land pit
D. None of the above

74. Phytoplankton, the food of the fishes flourish well in:
A. shallow water of the continental shelves
B. deep water of continental slope
C. bright sunrays
D. fresh water

75. Match the following developments in plant and their nutrients:

(a) Strong roots and stems	1. Nitrates
(b) Development of green leaves	2. Phosphates
(c) High yields	3. Potash

Codes:

	(a)	*(b)*	*(c)*
A.	1	2	3
B.	3	2	1
C.	2	3	1
D.	2	1	3

76. The floors of which biome is covered by carpet of needless and leaf litter.
A. Taiga biome
B. Mediterranean biome
C. Tropical monsoon biome
D. Tropical rain forest biome

77. Identify the organism from the following characteristic. It moves sideways not straight, it is a reptile, it always looks for shade, this organism is:
A. Jack rabbit B. Kitfox
C. Sidewinder D. Rattler

78. Most of the animals living the deserts.
A. Escape drought
B. Have nocturnal habits
C. Migrate seasonally
D. All of the above

79. Ephermal plants are those plants that
A. evade drought
B. endure drought
C. practice aestivation
D. have short life cycle

80. Which of the following is not a characteristic of Savanna region?
A. Animals use the same food at different times
B. Animals display remarkable camouflage
C. Animals are swift looted
D. It has large number of birds

81. The large number of 1st order consumers in the Savanna region is because of
A. migration that takes periodically from deserts
B. less number of carnivores
C. availability of easily digestible food
D. All of the above

82. An equatorial forest may contain all of the following trees except:
A. Ebony B. Iron wood
C. Baobab D. Green heart

83. What type of vegetation occurs where the following conditions prevail?
1. Podzol soils
2. Annual temperature range 38°C
3. Annual precipitation about 300 mm which is fairly evently distributed through the year.
A. Thorn scrub
B. Coniferous forest
C. Temperate grassland
D. Monsoon forest

84. Which of the following is associated with a savanna climate?
A. Shallow-rooted trees
B. Trees that grow throughout the year
C. Scrub
D. Dense evergreen forest

85. The buttress roots of the trees in the tropical rainforest is because:
A. the trees have to bear the mechanical load of hard woods.
B. Buttresses help to provide eration to soils.
C. Some organism found in the bittresses have symbiotic relationship.
D. The trees belong to graminae family.

86. Identify the creature from the following facts.
1. It is found in tropical rainforests.
2. It is the longest snake of the world.
3. It is non-poisonous.

A. Anaconda B. Python
C. ASP D. Sidewinder

87. The limiting facts of the savanna biome is:
A. light. B. nutirents.
C. shade. D. water.

88. Despite large number of animals the competition for food is not very fierce because of:
A. elaborate specialisation
B. large number of termites
C. recurrence of fire at various times
D. the gregarious habit of the animals

89. Identify the plant from the following characteristics.
1. They evade drought
2. They developvigorously
3. Produce large number of fruits and flowers during rain. These are:

A. Xerophytes B. Perennials
C. Ephermals D. Succulents

90. Which of the following statements regarding temperate grasslands is not true:
A. Temperate grasslands are almost treeless
B. In the drier regions, the grasses are shorter, tougher and coarse
C. Most of the grasses die in autumn through the year
D. Along water margins dense forests consisting of Chapparals are found

91. One of the features of the taiga biome that makes it prone to pests and diseases is that:
A. species diversity is low
B. trees occur in pure stands
C. most species are deciduous
D. leaves are trembling and deciduous

92. The deer caribou and moose population are subject to eruption. Their population is checked by:
A. Dingo B. Wiper
C. Fox D. Wolf

93. Trees are not common in Tundra because
A. the climatic conditions are too cold
B. the wind velocity is very high
C. Roots do not go deep enough
D. All of the above

94. Trees in Tundra are found only:
A. along rivers
B. near coniferous forests
C. in association with lichens
D. after summer thaw

95. The surface in the coniferous forest region is mostly covered by:
A. lichens, mosses, sedger and grasses
B. small spiny, shrubs
C. stunted conical shaped trees
D. All of the above

96. Most of the birds in the tundra region are:
A. nocturnal
B. hibernating birds
C. migratory
D. camouflaging birds

97. The animals survive the harsh tundra winter evironment because:
A. sub cutaneous fat which acts as insulator
B. hoer is raised to vertical position to trap air
C. their metabolic rate increases
D. All of the above

98. Which of the following Indian state has the largest forest area?
A. Arunachal Pradesh
B. Karnataka
C. Jammu & Kashmir
D. Madhya Pradesh

99. The secondary growth of forests consisting of short trees and dense undergrowth is called as—in Malaysia.
A. Belukar B. Masole
C. Milpa D. Ladany

100. Quebracho will be found in:
A. Gulf of states of USA
B. Brazil
C. S. E. China
D. Argentina

ANSWER

1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
D	D	D	A	A	B	D	D	D	B
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
C	A	D	D	D	D	A	B	A	B
21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
D	B	D	A	D	A	A	C	A	D
31	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
A	D	D	A	B	B	A	A	C	B
41	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**
C	A	C	A	C	C	A	A	C	A
51	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
D	A	E	D	C	A	B	A	B	A
61	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**
A	A	B	A	A	B	A	A	D	C
71	**72**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**
D	A	A	A	C	A	C	D	A	D
81	**82**	**83**	**84**	**85**	**86**	**87**	**88**	**89**	**90**
C	C	B	C	A	A	D	A	C	D
91	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**100**
A	D	D	A	C	C	D	D	A	B

10 Asia

1. The largest producer of Rubber in the world is:
   A. Malaysia B. Indonesia
   C. Thailand D. Phillipines
2. The biggest producer of ship in the world is:
   A. U.S.A. B. Germany
   C. China D. Japan
3. Which one of the following countries is most urbanised?
   A. Bangladesh B. Bhutan
   C. India D. Pakistan
4. The Mineral resource which has made Middle East of vital importance of the world today is:
   A. Coal B. Tin
   C. Oil D. Silver
5. **OPEC** stands for:
   A. Oil Producing European Countries
   B. Organisation of Petroleum Exporting Countries
   C. Oil and Petroleum Exploring Countries
   D. Organisation of Pacific Exploring Countries
6. Grand Bank is a major producer of:
   A. Rice B. Marine fisheries
   C. Iron-ore D. Tea
7. The most important river of Afghanistan is:
   A. Helmand river B. Kabul river
   C. Indus river D. Darya river
8. Which among the following is a land locked country?
   A. Iraq B. Turkey
   C. Afghanistan D. Greece
9. The capital of Greek—Cyprus is:
   A. Byzantine B. Acre
   C. Nicosia D. Erosis
10. The Trans-Iranian Railroad extends from:
    A. Persian Gulf to Zagros mountains
    B. Persian Gulf to Caspian Sea
    C. Persian Gulf to Elburz mountains
    D. Persian Gulf to Mediterranean Sea
11. Shatt al Arab is:
    A. a river formed by the junction of Tigris and Euphrates
    B. Port on the Persian Gulf.
    C. Oil refining centre of Iraq.
    D. Oil field in Iran.
12. Which is the biggest oil refining centre in Iran?
    A. Bushehr B. Shiraz
    C. Abadan D. Dezful
13. With which countries does Iraq have a common border on its south?
    A. Kuwait and Iran
    B. Syria and Jordan
    C. Jordan and Saudi Arabia
    D. Saudi Arabia and Kuwait
14. Which country forms a small archipelago between the Quatar peninsula and Saudi Arabia?
    A. Kuwait B. Bahrain
    C. Oman D. Yemen
15. Which countries border the Sea of Galilee?
    A. Israel, Jordan and Syria
    B. Israel. Jordan and Egypt
    C. Lebanon, Syria and Israel
    D. Lebanon, Jordan and Israel
16. The famous island in the Arabian Sea which is a part of Yemen is:
    A. Aden
    B. Socotra
    C. Abdal Kuri
    D. Kuria Muria

17. Rub-al-Khali desert also called the Empty Quarte is in:
A. Iran B. Iraq
C. Syria D. Saudi Arabia

18. .....is the largest exporter of natural gas in the world.
A. Saudi Arabia B. Iraq
C. Iran D. Egypt

19. The largest product passing through Suez Canal is:
A. Wheat B. Petroleum
C. Coal D. Sugar

20. Name the two straits that a ship has to pass through while going from the Mediterranean to the Black Sea.
A. Marmara and Aegean Sea
B. The Dardanelles and the Bosporous
C. Istanbul and Rhodes
D. Istanbul and Aegeans Sea

21. Which sea separates European and Asian Turkey?
A. Sea of Marmara
B. Mediterreanean Sea
C. Black Sea
D. Dead Sea

22. Which part of Egypt is in Asia?
A. Gaza B. Sinai Peninsula
C. Suez D. The Bitter Lakes

23. Which of the statement is NOT true about the people of Jordan?
A. They have a religious tradition of Christianity
B. Culturally they are more like Americans
C. They speak one of the related Indo-European language
D. They are caucasoids

24. Chena cultivation is found in:
A. China B. Indonesia
C. Thailand D. Sri Lanka

25. Mesopotamia is now known as:
A. Lebanon B. Saudi Arabia
C. Iran D. Iraq

26. Which valley lies between the Lebanon and Anti-Lebanon ranges?
A. Damascus B. Horns
C. Tripoli D. Bekka

27. Jeddah is the port of which city?
A. Mecca B. Medina
C. Dahran D. Riyadh

28. Iraq's most important rivers are:
A. Tigris and Litani
B. Tigris and Euphrates
C. Orontes and Euphrates
D. Orontes and Tigris

29. The strait of Hormuz separates:
A. Oman and Iran
B. Bahrain and Quatar
C. U.A.E. and Oman
D. Iran and U.A.E.

30. The largest single item by value in exports of Israel is accounted for by:
A. Gold B. Diamond
C. Food grains D. Oil

31. Name the Peninsula which is a Gulf Nation?
A. Quatar B. Oman
C. Kuwait D. Bahrain

32. Dead Sea is between:
A. Egypt and Sinai Peninsula
B. Sinai Peninsula and Jordan
C. Jordan and Saudi Arabia
D. Israel and Jordan

33. Which among the following countries does not have petroleum and natural gas resources?
A. Libya B. Kuwait
C. Egypt D. Turkey

34. Tibesti Mountains are located in:
A. Rub al khali. B. Gobi.
C. Sahara. D. Iranian desert.

35. Which of the following countries have tropical Savannah climate?
A. Sudan B. Ethiopia
C. Somalia D. All the above

36. What is the name of pass that links the Northern Peninsula with the rests of Sri Lanka?
A. Mannar Bridge
B. Mallaitivu
C. Point Pedro Cause way
D. Elephant Pass

37. The Mountain which is the most sacred to people of all faiths in Sri Lanka is:
A. Adam's Peak. B. Hutton.
C. Pidrutlagola D. Nuwara Eliya

38. The major portions of population of Sri Lanka is made up of:
A. Tamils
B. Buddhist Sinhalese
C. Guerrilla
D. Roman Catholics and Muslims

39. Ho Chi Minh city is also the name of:
A. Manchuria
B. Saigon
C. Hong Kong
D. None of the above

40. Bhumipal Dam is in:
A. India. B. Myanmar
C. Indonesia. D. Thailand.

41. Shanxi and Shenxi regions are famous for:
A. Coal deposits
B. Gold deposits
C. Petroleum deposits
D. Iron ore deposits

42. The south east of the Tibetan plateau is cut into ridge canyon country by the upper courses of:
A. Tsangpo B. Mekong
C. Yangtze Kiang D. All of these

43. The first railway was build in Japan in
A. 1842 B. 1872
C. 1895 D. 1902

44. The most important raw silk producing regions of China is:
A. Manchuria
B. Shantung
C. North China Plain
D. Helong Jiang

45. What is the fourth island of Japan after Shikoku, Hokkaido and Honshu?
A. Kuriles B. Kyushu
C. Ryukyu D. Sakhalin

46. The manufacturing belt of Japan owes its location chiefly to:
A. abundant local supply of raw materials
B. availability of skilled labour
C. accessibility to imports of raw materials
D. the large cities around the Inland Sea

47. After rubber which of the following crop is the most important in Malaysia?
A. Rice B. Wheat
C. Coconut D. Tea

48. Today Malayasia has become the home of rubber, but it was originally brought from:
A. The Cango Basin B. Java
C. Sri Lanka D. Amazon Basin

49. On which island is Nagasaki located?
A. Kyushu B. Honshu
C. Okinawa D. Shikoku

50. In Japan, the most densely populated areas are in the.....part.
A. Eastern B. Western
C. Southern D. Both A and C

51. What is the familiar name of China's longest river?
A. Red River B. Yangtze-Kiang
C. Yellow River D. Amur River

52. In China suitable climate, ideal conditions for agriculture, good. Soils are the factors which have led to high concentration of population in:
A. North China Plain
B. Yangtse Basin
C. Sinkiang Basin
D. All of these

53. The factor responsible for rich agricultural lands in Java is:
A. suitable climate which is neither too hot nor too dry
B. people concentrate on agriculture as chief economic activity
C. rich volcanic soil
D. It is accessible from all directions

54. .....forms the border between Laos and Thailand.
A. Meham Chao Praya
B. Rajang
C. Mekong
D. Red River

55. The main religion of Myanmar is:
A. Buddhism of Mahayana School.
B. Buddhism of Hinayana School.
C. Jainism
D. Confucism

56. The Mount Saramati Peak is in:
A. Thailand B. Myanmar
C. Indonesia D. Malaysia

57. .....are numerically dominant in China.
A. Manchus B. Han Chinese
C. Mongols D. Tibetan

58. .....is the leading iron and steel producing centre of China.
A. Anshan B. Beijing
C. Shenshi D. Shanghai

59. What is Mongolia's great desert called?
A. Great Mongolian Desert
B. Gobi Desert
C. China Desert
D. Siberian Desert

60. Of which country is Ulan Bator the capital?
A. Indonesia B. Mongolia
C. North Korea D. Laos

61. Lop Nor in China is famous for:
A. Hydro-Electricity Project
B. Nuclear Activity
C. Silk Production
D. Coal

62. What is the chief agricultural activity of Mongolia?
A. Stock-raising B. Wheat-growing
C. Horticulture D. Sheep-farming

63. Which of the following deserts is/are in China?
1. Takla Makan 2. Alashan
3. Ordos 4. Shen-Chei

Codes:
A. All of these B. 1 and 2 only
C. 1, 2 and 3 only D. 1, 3 and 4 only

64. The Chinese civilization was born in the valley of:
A. Hwang Ho B. Sinkiang
C. Yangzte D. Wei Ho

65. Kalimantan and Sulawasi are separated by:
A. Sunda Strait B. Johore Strait
C. Makasar Strait D. Malacca Strait

66. Which is the southernmost of the major islands in the Philippines?
A. Mindanao B. Luzon
C. Leyte D. Negros

67. The largest island of Philippines is:
A. Luzon B. Visayan
C. Mindanas D. Palawan & Sulu

68. What separates Sumatra and Malaysia?
A. The Mergui Archipelago
B. The Gulf of Siam
C. The Java Sea
D. The Malacca Straits

69. Which is known as the spice island?
A. Sumatra B. Java
C. Malacca D. Sulawasi

70. Which island of Indonesia has the largest proportion of Hindus?
A. Bali B. Sumatra
C. Java D. Kali Mantan

71. The strait of Johore separates:
A. Vietnam and Singapore
B. Laos and Singapore
C. Borneo and Singapore
D. Malaya and Singapore

72. The strait of Malacca separates Malaya from:
A. the island of Sumatra
B. the island of Java
C. the island of Kalimantan
D. the island of Celebes

73. Which of the following is/are the aboriginals of Malaysia?
1. Ainu 2. Fula
3. Sakai 4. Semang

Codes:
A. only 1 and 3 B. only 2 and 3
C. only 3 and 4 D. All of these

74. The term "boat people" referred to the migrants from:
A. Vietnam to Thailand
B. Sri Lanka to India
C. Taiwan to Mainland China
D. Vietnam to the U.S.A.

75. Which is the most fertile island of Indonesia?
A. Kalimantan B. Sumatra
C. Java D. Bali

76. The Siwaliks stretch between.....
A. Indus and Sutlej
B. Potwar Basin and Teesta
C. Sutlej and Kali
D. Sutlej and Teesta

77. The major contributor of Brunei's export is:
A. oil B. coconut
C. rice D. rubber

78. The sole commercial crop of any importance in Brunei is:
A. coconut B. oil seed
C. pineapple D. rubber

79. Lake Tonle Sap is in:
A. Thailand B. Malaysia
C. Kampuchea D. Indonesia

80. The mountain range in S.W. Kampuchea is:
A. cardamom B. dangrek
C. elephant D. kampot

81. The ethnic minority of Thailand is:
A. Chinese B. Christian
C. Muslim D. None of these

82. Island of Phuket in Thailand is famous for:
A. tin B. silver
C. gold D. zinc

83. The great alluvial lowland of Thailand is drained by:
A. Menamchaopraya
B. Mekong
C. Salween
D. Nanking

84. Which major river in Myanmar forms part of the boundary with Thailand?
A. Sittang B. Salween
C. Chindwin D. Irrawaddy

85. In which country is phuket, a well known tourist resort located?
A. Thailand B. Indonesia
C. Malaysia D. Cambodia

86. The main railway junction of Myanmar is:
A. Mandalay B. Rangoon
C. India D. Moulmein

87. Rubber is grown chiefly in the area of:
A. Windward side of Arakan Yoma
B. Central lowland
C. Shan plateau
D. Tonnaserum

88. What is the main crop of Myanmar?
A. Rice B. Rubber
C. Oilseed D. Cotton

89. Where is Lashio and why is it significant?
A. An oil town in Myanmar.
B. A ruby mining centre in Myanmar.
C. A rail terminus in Myanmar from which a World War II highway leads to China.
D. A major port on the Irrawaddy.

90. Hiroshima-Kobe region of Japan is an important region for:
A. Ship building
B. Large iron and steel factories
C. Lumbering
D. None of these

91. Which is the biggest city in central Myanmar?
A. Pegu B. Prome
C. Mandalay D. Myitkyina

92. The rivers Irrawaddy and Sitang are separated by:
A. Arakan Yoma B. Peguyoma
C. Chin Hills D. Pidarutalayala

93. River Irrawady drains into the:
A. Gulf of Martaban
B. Gulf of Tonkin
C. Gulf of Thailand
D. Celebes Sea

94. Which of the following is correct about Myanmar?
A. Mountain zone is in the west
B. The central part is a basin
C. Eastern Myanmar is made up of a highland plateau
D. All of these

95. On which island is George town?
A. Penang B. Phuket
C. Langkawi D. Singapore

96. .....is the land of Annamites.
A. Vietnam B. Thailand
C. Malaysia D. Myanmar

97. With which country does laos have a common eastern border?
A. China B. Thailand
C. Cambodia D. Vietnam

98. The only S. E. Asian country which does not have a coastline?
A. Myanmar B. Laos
C. Cambodia D. Thailand

99. Which is the northernmost of the major Indonesian islands?
A. Sulawesi B. Java
C. Sumatra D. Kalimantan

100. Mekha and Malekha are the source rivers of the river:
A. Chindwin B. Meham
C. Perak D. Irrawaddy

101. Which of the following is the major populated region in the world?
A. South Asia
B. North-West Europe
C. East Asia
D. All of these

102. Which of the following is the most densely populated country of the world?
A. China B. India
C. Singapore D. Canada

103. The urban population of the world is growing faster than its rural population. This is mainly because of:
A. high birth rate in towns
B. rural-urban migration
C. high death rate in rural areas
D. low death rate in towns

104. Which of the following is the major tribe of Japan?
A. Fula B. Eskimo
C. Ainu D. None of these

105. Which one is the most densely populated area of the world?
A. Nile valley and delta
B. East Asia
C. Southern Europe
D. Western Europe

106. The East Asian population cluster accounts for about ---------- of the total world population.
A. 25 percent B. 30 percent
C. 26 percent D. 10 percent

107. Which country has a less than 1% population growth rate?
A. Iraq B. China
C. Pakistan D. Japan

108. A higher density of population is favourable to:
A. Capital formation
B. Agricultural growth
C. Industrial growth
D. Labour supply

109. The higher density of agricultural population is found in:
A. Java B. India
C. Philippines D. China

110. Oyster-fishing is practised in:
A. Peru and Chile B. North America
C. Japan D. China

111. Fish farming in paddy fields is practised in:
A. China
B. Africa
C. Peru & Brazil
D. None of these

112. In which one of the following countries is Lake Balkhash situated?
A. Iran B. Kazakhstan
C. Afganistan D. Oman

113. The most effective farming method for returning minerals to the soil is:
A. Contour ploughing
B. Croprotation
C. Furrowing
D. None of these

114. **Assertion (A):** Water in fields for paddy cultivation should not be stagnant.
Reason (R): Soil aeration and nitrate formation are impeded in stagnant water and this decreases yield.
A. A and R are both correct but R does not explain A
B. A and R are correct and R explains A
C. A is correct but R is wrong
D. Both A and R are wrong

115. Which one of the following is known as the land of white elephants?
A. India B. China
C. Indonesia D. Thailand

116. Which river is called the 'Yellow river'?
A. Ganga B. Mahanadi
C. Hwang Ho D. Damodar

117. Consider the following statements:
1. In the world, the tropical deserts occur along the western margins of continents within the trade wind belt.
2. In India, the East Himalayan region gets high rainfall from north-east winds.
A. 1 only B. 2 only
C. Both 1 and 2 D. Neither 1 nor 2

118. Consider the following pairs:

Organisation	*Location of HQ*
1. Asian Development Bank	: Tokyo
2. Asia-Pacific Economic Cooperation	: Singapore
3. Association of South East Asian Nations	: Bangkok

Which of the above pairs is/are correctly matched?
A. 1 and 2 only B. 2 only
C. 2 and 3 only D. 3 only

119. Consider the following countries:
1. Brunei Darussalam
2. East Timor
3. Laos
Which of the above is/are member/ members of ASEAN?
A. 1 only B. 2 and 3 only
C. 1 and 3 only D. 1, 2 and 3

120. Which are amongst the following has the largest livestock population in the world?
A. Brazil B. China
C. India D. USA

121. Which one of the following cities is nearest to the equator?
A. Colombo B. Jakarta
C. Manila D. Singapore

122. Which two countries follow China and India in the decreasing order of their populations?
A. Brazil and USA
B. USA and Indonesia
C. Canada and Malaysia
D. Russia and Nigeria

123. Among the following South Asian Countries, which one has the highest level of urbanisation?
A. Sri Lanka B. Bangladesh
C. Pakistan D. Nepal

124. In which one of the following basins is Taklamakan desert located?
A. Tarim basin B. Lopnor basin
C. Kerulin basin D. Red basin

125. In which one of the following countries do the ethnic communities called Karen, Kachin and Chin live?
A. Australia B. Indonesia
C. Myanmar D. Sri Lanka

126. Among the following countries, which one has the highest total fertility rate?

A. India B. Pakistan
C. Nepal D. Bangladesh

127. In which one of the following countries is Barail Range located?
A. Afghanistan B. Sri Lanka
C. Pakistan D. India

128. Which one of the following pairs is correctly matched?
A. Gulf of Martaban : Yangon
B. Gulf of Tong King : Shanghai
C. Gulf of Mannar : Trincomalee
D. Gulf of Aqaba : Cairo

129. Consider the following pairs:
1. Biwa Ko : Largest lake in Japan covering about 670 km^2.
2. Sichuan Pendi : One of China's rice producing areas.

Which of the pairs given above is/are correctly matched?
A. 1 only B. 2 only
C. Both 1 and 2 D. Neither 1 nor 2

130. Among the following South Asian Countries, in which one is the Maternal Mortality Rate lowest?
A. Nepal B. India
C. Bangladesh D. Pakistan

131. Which mediterranean island is considered an independent Asian country?
A. Malta B. Cyprus
C. Crete D. Rhodes

132. Good deposits of coal are rare in Middle-East countries, which is found in
A. Afghanistan. B. Iran.
C. Turkey. D. Saudi Arabia.

133. Armenian knot joins two mountain ranges:
A. Taurus and Anti Taurus
B. Anti Taurus and Elburz
C. Elburz and Zagros
D. Hindukush and Elburz

134. Khyber Pass connects:
A. Indian and Afghanistan
B. Afghanistan and Pakistan
C. Pakistan and India
D. Iran and Afghanistan

135. The dry areas of Afghanistan are being recalimed are resettled by providing irrigation water from the irrigation and power projects of:
A. Darya river. B. Helmand river.
C. Kabul river. D. Indus river.

136. Which country connects Russia with India ?
A. Pakistan B. Tibet
C. Afghanistan D. None of them

ANSWER

1	2	3	4	5	6	7	8	9	10
C	C	D	C	B	B	B	C	C	B
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
A	C	C	B	A	B	D	C	B	B
21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
A	B	B	D	D	D	A	B	A	B
31	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
A	D	D	C	D	D	A	B	B	D
41	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**
A	D	A	B	B	C	A	D	A	C
51	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
B	B	C	C	A	B	B	A	B	B

61	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**
B	A	C	D	C	A	A	D	C	A
71	**72**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**
D	A	C	A	C	B	A	D	C	C
81	**82**	**83**	**84**	**85**	**86**	**87**	**88**	**89**	**90**
A	A	A	B	A	A	D	A	C	A
91	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**100**
C	B	A	D	A	A	D	B	C	D
101	**102**	**103**	**104**	**105**	**106**	**107**	**108**	**109**	**110**
C	C	B	C	B	A	D	D	A	C
111	**112**	**113**	**114**	**115**	**116**	**117**	**118**	**119**	**120**
A	B	B	B	D	C	A	B	C	C
121	**122**	**123**	**124**	**125**	**126**	**127**	**128**	**129**	**130**
D	B	C	A	C	B	D	A	C	A
131	**132**	**133**	**134**	**135**	**136**				
B	C	B	B	B	C				

11 China

1. China is the largest producer in the world of:
   A. Tinned fish B. Salted fish
   C. Frozen fish D. All of the above
2. In China, sheep are kept on extensive farms in:
   A. the western province of sinkiang
   B. the inner Mongolia
   C. Both A and B
   D. None of the above
3. Hwang Ho Basin is the famous for the production of:
   A. Sugar cane
   B. Rice
   C. Wheat
   D. Maize
4. A part from canton the other silk producing centres of China is/are:
   A. Central and southern China
   B. Shandong peninsula
   C. Northern China
   D. Both A and B
5. China Tea is sometimes called as:
   A. Black tea B. Green tea
   C. Brown tea D. None of these
6. China ranks.....in the world production of maize.
   A. First B. Second
   C. Third D. Fourth
7. Highest density of population in China is found in:
   A. Sikiang Valley
   B. Yangtize Kiang Valley
   C. Hwang Ho Valley
   D. None of these
8. The biggest cotton textile centre of China is located in:
   A. Canton B. Nanking
   C. Sanghai D. Sichuan
9. More than half of the total silk production in China comes from the:
   A. Yangtize and Sikiang deltas
   B. Wang Ho delta
   C. Sikiang delta only
   D. from the Yangtize delta only
10. China is the leading producer of.....in the world.
   A. Rice and Wheat
   B. Maize, Potato
   C. Soyabeans and Oats
   D. Pulses, vegetables
11. Agriculture in China is:
   A. extensive
   B. intensive
   C. primitive
   D. None of the above
12. More than 75% of Chinese population is engaged in agriculture but only.....of the total land of China is suitable for cultivation.
   A. 15% B. 20%
   C. 30% D. 40%
13. China has a:
   A. Continental climate
   B. Mediterranean climate
   C. Tropical Monsoon Climate
   D. Modified form of Monsoon climate
14. Summer rainfall in China is mainly caused by:
   A. the south-west monsoon
   B. the south-east monsoon
   C. the north-east monsoon
   D. the north-west monsoon
15. The Sikiang China third great river flows through the:

A. Great Northern Plain of China
B. Central part of the China
C. Southern part of China
D. None of the above

16. The Hwang Ho river drains into:
A. Yellow sea
B. The bay of Bengal
C. The Gulf of Mannar
D. None of the above

17. The Yangtize Kiang flows:
A. from east to west
B. from west to east
C. from north to south
D. from south to north

18. The Yangtize Kiang is:
A. China's most important river
B. the longest river in Asia
C. the longest river in China
D. all of the above

19. The Hwang Ho is often called the yellow river because:
A. it carries huge amount of yellow silt
B. the colour of the bed on which the river flows is yellow
C. of the skin colour of the people in habiting on the bank
D. none of the above

20. Takla makan is a:
A. mountain range in the south China
B. mountain range in the north China
C. barren desert in the north—west China
D. none of the above

21. The Tien Shan mountain range is located in the:\
A. Central Plain
B. Northern China
C. North-west China
D. Southern China

22. The Gobi is a famous desert of China, located in:
A. the interior
B. the extreme south
C. the extreme north
D. the extreme west

23. The river often called yellow river:
A. the Hwang Ho
B. the Sikiang
C. the Yangtize
D. none of these

24. The roof of the world is name given to:
A. Leh
B. Pamir
C. Tienshan
D. None of these

25. The Nan Shan mountain range is located in China in the:
A. North B. South
C. East D. West

ANSWER

1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
A	C	C	D	B	B	C	C	A	A
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
B	A	D	B	C	A	B	D	A	C
21	**22**	**23**	**24**	**25**					
C	A	A	B	A					

12 Europe

1. The largest city of Europe is:
   A. Paris B. Belgium
   C. London D. Vienna
2. Manchester is known for:
   A. Silk Industry B. Woolen Textile
   C. Cotton Textile D. None of these
3. Which of the following ports is not situated at pacific coast?
   A. Vancouver B. Los Angeles
   C. San Francisco D. Miami
4. Which of the following airports is not situated at New York-Tokyo air route?
   A. London B. Paris
   C. Rome D. Panama
5. The busy port of Rotterdam is situated in:
   A. The Netherlands B. Belgium
   C. Denmark D. Germany
6. The highest peak in the British Isles is:
   A. Ben Nevis B. Mt. Blank
   C. Mt. Elbrus D. Apennine
7. The river Thames rises in the:
   A. Cumbrian hills B. Catswold hill
   C. Cheviot hills D. Ben Nevis
8. Beef cattle like the Aberdeen, Angus and Here fords are reared in:
   A. U.K. B. Portugal
   C. Norway D. Belgium
9. Which one of the following is the largest oil field of U.K.?
   A. Forties B. Brent
   C. Piper D. Thistle
10. Wedgwood Chinaware is produced by:
   A. France B. U.K.
   C. Italy D. Spain
11. Which of the following countries is well known for its Linen (manufactured from flax)?
   A. France B. Iceland
   C. Belgium D. Ireland
12. The country which has its one-third part in the north of the arctic circle is:
   A. Norway B. Sweden
   C. Spain D. Belgium
13. **Assertion (A):** In spite of complete absence of any sunlight for two and a half months, Norway does not experience severe Arctic winters.

   Reason (R): Norway current (a branch of the north Atlantic drift) influences the climate of Norway.
   A. Both A and R are true and R is the correct explanation of A
   B. Both A and R are true but R is not the correct explanation of A
   C. A is true but R is false
   D. A is false but R is true
14. Kirkenes iron-field is situated in:
   A. Belgium B. Norway
   C. Finland D. Iceland
15. Which of the following places/cities has the distinction of being the most northerly city in the world?
   A. Hammerfest B. Oslo
   C. Stockholm D. Helsinki
16. Which of the following physiographic divisions is regarded as the garden of Sweden?
   A. Berglagen B. Svealand
   C. Norrland D. Gotaland
17. Which of the following cities is often called the venice of the north?

A. Stockholm B. Oslo
C. Helsinki D. Lisbon

18. In which of the following countries the shortness of the summer is compensated by length of the days as the sun shines for 18 or 19 hours during the day?
A. Portugal B. Finland
C. Spain D. Germany

19. Sauna baths (dry heat baths) are characteristics of:
A. Belgium B. Finland
C. Austria D. Poland

20. Zea Land is an island situated on the east coast of:
A. Russia B. Netherlands
C. Denmark D. Belgium

21. Which of the following countries consists of dry infertile plateau, the meseta?
A. Spain B. Denmark
C. Greece D. Italy

22. Sherry, a world famous wine, is manufactured in:
A. Portugal B. Iceland
C. Denmark D. Spain

23. Which of the following cities was formely spoken of as "an enormous lion crouched between the Atlantic and the mediterranean"?
A. Barcelona B. Helsinki
C. Gibralter D. Madrid

24. Port is the famous wine of:
A. Portugal B. Spain
C. Germany D. Austria

25. Reds, Roses and Whites are the premium quality wines, manufactured by:
A. Netherland B. France
C. Germany D. Italy

26. Which of the following is main coal field of France that supplies 50% of its total coal production?
A. The Lorraine
B. The Nord
C. The Lower Rhone Valley
D. The Lacq

27. The compine is a low Sandy and marshy region which has been reclaimed from the Sea by:
A. Portugal B. Belgium
C. Spain D. Italy

28. The national flower of Netherlands is:
A. Lotus B. Sun-flower
C. Rose D. Tulip

29. The wine lacrimae Christi (the tears of Christi) is manufactured by small grapes cultivated on the volcanic soil of the slopes of the Mt. Vesuvius in:
A. Milan B. Rome
C. Helsinki D. Paris

30. The rail tunnels such, as St. Gothard and simplon, and road tunnels such as St. Bernard have been constructed to overcome the mountain barrier in:
A. Switzerland B. Greece
C. Austria D. Portugal

31. As polder is to Netherlands, so is marschen to:
A. Germany B. Switzerland
C. Poland D. Italy

32. The Rhine Westpharia region is regarded as the heart of Germany because of its:
A. sheep rearing farms
B. pairy products
C. wheat cultivation
D. Industries

33. The internationally famous Dresden Chinaware is a product of:
A. Germany B. Poland
C. Russia D. Hungary

34. The world famous Ikrus trucks and buses are manufactured by:
A. Italy B. Hungary
C. Czech D. Slovak

35. Corinth Canal is situated in:
A. Greece B. France
C. Germany D. Poland

36. The ancient temple, parthenon is situated in:
A. Greece B. Italy
C. Germany D. Switzerland

37. The Romanian firs growing on the high mountain slopes provide wood which is prized for the manufacture of:
A. cricket bats
B. musical instrument
C. riffle parts
D. railway carriage

38. The oil fields such as craiova and ploesti are situated in:
A. Romania B. Bulgaria
C. Hungary D. Germany

39. Romania is self-sufficient practically in all industrial minerals except:
A. iron B. coal
C. petroleum D. natural gas

40. Which of the following cities has the magnificent harbour known as Golden Horn?
A. Gib ralter B. Lisbon
C. Constanta D. Istambul

41. To the east, which of the following ranges separates Europe from Asia?
A. Vesuvius range B. Ural range
C. Etna range D. Elbrus range

42. **Assertion (A):** The mediterranean lands of Europe fall under the influence of the dry trade winds in summer.
Reason (R): The Doldrums move the north towards the tropic of cancer with the migrating overhead sun.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

43. **Assertion (A):** The three hot regions of the world—equatorial forests, savannah lands and hot deserts are not found any where within the borders of Europe.
Reason (R): Europe is situated entirely outside the tropics.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

44. Which of the following European countries has the honour of having the highest tractor density in the world?
A. U.K. B. Portugal
C. Norway D. Belgium

45. Convent Garden in.....is the best known fresh vegetable market in Britain.
A. Glasgow B. Liverpool
C. London D. Belfast

46. Which of the following is correctly matched?
1. Ford — Dagenham
2. Morris — Oxford
3. Rolls-Royce — Derby
Codes:
A. only 1 B. 1 and 2
C. 2 and 3 D. All of these

47. Cut a glassware and Beleck Chinaware are the two specialized industries of:
A. Iceland B. Ireland
C. Spain D. Germany

48. The largest glacier of Europe, Jos tedalsbre is situated in:
A. Finland B. Norway
C. Sweden D. Iceland

49. Which of the following places/cities calls itself the herriny capital of the world?
A. Alesund B. Trondheim
C. Bergen D. Trosmo

50. Which of the following physiographic divisions is regarded as the garden of Sweden?
A. Skane B. Svealand
C. Norrland D. Berglagen

51. Which of the following cities on the Gulf of Bothopia is often called the Gateway to the west?
A. Tampere B. Tapiola
C. Turku D. Helsinki

52. Which of the following is the only country which has no army, no navy and has never fought a war?
A. Iceland B. Denmark
C. Netherlands D. Spain

53. La Mancha (the thirsty land) is situated in:
A. Denmark B. Russia
C. Portugal D. Spain

54. Bull ring is the national sport of:
A. Austria B. Denmark
C. Spain D. Italy

55. **Assertion (A):** France, Belgium and Netherlands come with the influence of the south-westerlies in all seasons.
Reason (R): These three countries lie between 43°N and 53°N.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

56. Brittany in France is famous for the cultivation of:
A. wheat B. barley
C. sugarcane D. sugarbeet

57. Which of the following countries has no rival in the production of top quality wines?
A. France B. Germany
C. Russia D. Denmark

58. Which of the following countries has given the lead by the construction of the first tidal power station of the world?
A. France B. Russia
C. Germany D. U.K.

59. Which of the following options correctly explains the terms polder?
A. It is a land which has been reclaimed from the sea
B. It is the place where rivers meet the Sea or Ocean
C. It is a warm water current of Indian Ocean
D. It is an instrument which measures the depth of ocean

60. Most of the people of Europe belong to:
A. Mongoloid B. Dinaric
C. Caucasoid D. Alpnoid

61. Which of the following can be regarded as the best known industry of Switzerland?
A. Sugar industry
B. Leather industry
C. Watch and clock industry
D. Beverage industry

62. **Assertion (A):** The Erzgebirge range (Germany) on the borders of czech and Slovak is known as the ore mountain.
Reason (R): Variety of minerals are found in the Erzgebirge range.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

63. The source of river Danube is:
A. Black Forest mountain
B. Harz mountain
C. Bavarian Alps
D. Zugspiyze peak

64. Emsland, situated in the north-west of Germany, is famous for its:
A. coalfield B. iron field
C. copper field D. oil field

65. **Assertion (A):** The little plain area around the Gyor region is the richest agricultural region of Hungary.
Reason (R): The little plain is favoured by the equable climate and fertile alluvial soil.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

66. Grete and Rhodes are the largest inhabited islands scattered on the blue waters of the Aegean Sea under the sovereignty of
A. Hungary B. France
C. Greece D. Italy

67. **Assertion (A):** The soil of Greece is mostly infertile.
Reason (R): Physical feature of Greece is mountainous.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

68. As wine is to France, so is at far of roses to:
A. Austria B. Romania
C. England D. Bulgaria

69. Which of the following countries is second only to Russia both as a producer and as an exporter of oil and natural gas?
A. Bulgaria B. Romania
C. Germany D. France

70. The plain of trace is the best cultivated region of:
A. Hungary B. Romania
C. Albania D. Turkey

71. The valley of the fallen, a sad memorial is situated in:
A. Barcelona B. Avila
C. Gibralter D. Madrid

72. **Assertion (A):** Portugal has an abundance of trees and plants of both the northern and the southern European varieties.
Reason (R): The climate of portugal is influenced by both the Atlantic Ocean and the mediterranean sea.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

73. The Paris Basin and flanders in France are well-known for the cultivation of:
A. sorghum B. sugarcane
C. sugarbeet D. wheat

74. Match List I with List II and select the correct answer using the code given below the lists:

List I (Fruit)	***List II (Area)***
(a) Apples	1. Aquitaine
(b) Plums	2. Provence
(c) Peaches	3. Rhone valley
(d) Mediterranean fruits	4. Brittany

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	4	1	3	2
B.	1	4	2	3
C.	3	2	4	1
D.	2	3	1	4

75. Which of the following areas in France is noted for having enormous quantity of natural Gas?
A. The Lower Rhone Valley
B. The Lorraine
C. The Nord
D. The Lacq

76. The boundary between Germany and Poland is called the:
A. Hindenburg line B. Maginot line
C. Durand line D. 17th paralled

77. Palders are charcteristics of:
A. Netherlands B. Russia
C. U.K. D. Bulgaria

78. The people of which of the following countries were once called Angles of the mud due to their determination to save the precious documents and works of art which were completely covered by water, mud and oil as a result of flood caused by the river?
A. Italy B. France
C. Spain D. Austria

79. Which of the following rivers separates Germany from Poland?
A. The Oder B. The Danube
C. The Elb D. The Rhine

80. In which of the following countries military training at regular periods is essential for all men between 20 and 50 years?
A. Switzerland B. France
C. Belgium D. Austria

81. Which of the following European countries is a land locked country?
A. Hungary B. Portugal
C. Netherlands D. Norway

82. Which of the following capital cities is noted for its thermal springs?
A. Budapest B. Lisban
C. London D. Paris

83. Pindus mountain range lies in
A. Poland. B. Germany.
C. France. D. Greece.

84. **Assertion (A):** The soil of Greece is mostly infertile.
Reason (R): Physical feature of Greece is mountainous.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

85. The most important industry of Greece is:
A. fishing
B. wine manufacturing
C. ship building
D. sheep rearing

86. Transylvanian Plateau is situated in:
A. Hungary B. Romania
C. Bulgaria D. Iceland

87. Which of the following is the highly industrial region of Europe?
A. Ruhr B. Rhine
C. Lorraine D. None of these

88. Tirana is the capital of
A. Albania B. Turkey
C. Romania D. Bulgaria

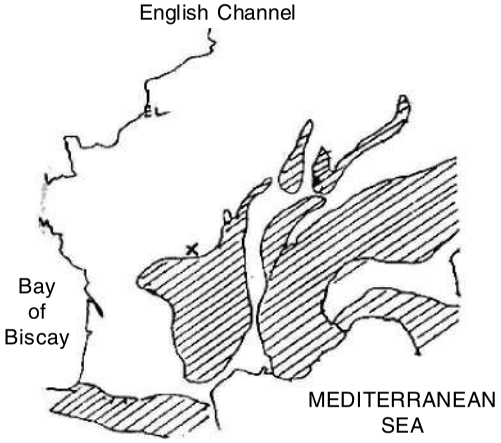
89. Which of the following river separates Germany from Poland?
A. The Rhine B. The Elb
C. The Oder D. The Danube

90. The shaded area in the map of Germany represents:



A. Potash B. Coal
C. Manganese D. Iron

91. In the following map the X mark represents

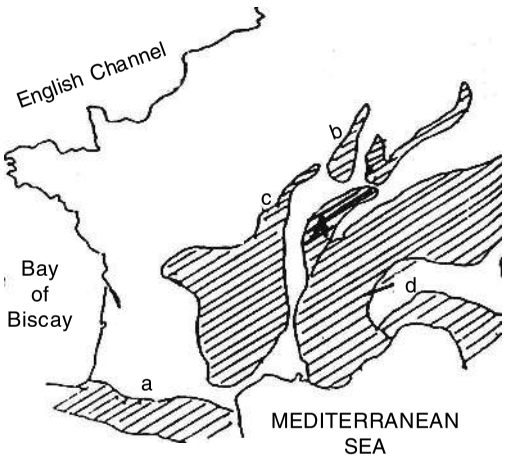


A. Pyrenees mountains
B. Cantabarian mountains
C. Pennine mountains
D. Central Massif

92. The island of Sardinia belongs to which country?
A. Italy B. France
C. Spain D. Malta

93. France has great mountain ranges on its south and east. Name these ranges on map as marked a, b, c, d.

1. Vosages mountain
2. Jura mountain
3. Pyrenees mountain
4. Alps mountain

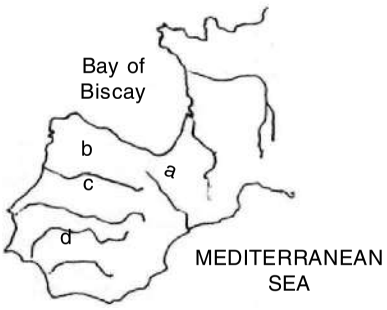


Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	3	1	2	4
B.	1	2	3	4
C.	2	3	2	4
D.	4	1	2	3

94. In the given map name the rivers marked as a, b, c, d respectively are:

1. Ebro
2. Douro
3. Tagus
4. Guadina



Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	1	2	3	4
B.	2	1	3	4
C.	1	4	2	3
D.	3	2	1	4

95. In the following map the shaded areas are places that are:



A. unsuited to vegetation growth
B. zone of mixed farming
C. zone of intensive cultivation
D. mixed coniferous forests

96. Name the mountain range marked X in the map.



A. Alps mountains
B. pennine mountains
C. Carpathian mountains
D. Kjolan mountains

97. In the following map the X mark represent:



A. Rhone
B. Rhine
C. Danube
D. Seine

98. Which is the resort city/town of France?

A. Nice
B. Life
C. Marscilles
D. Monaco

99. France's main mediterranean naval base is:
A. Lyons B. Nice
C. Toulon D. Marscilles

100. Britanny is a part of which country?
A. France B. Belgium
C. Britain D. Ireland

101. The largest inland water body in Europe is:
A. Lake Leman B. Arab Sea
C. Caspian D. Lake Constance

102. Balearic islands are located in the:
A. Arctic Ocean
B. Adriatic Sea
C. Atlantic Ocean
D. Arctic Ocean
E. Mediterranean Sea.

103. Another island besides Malta, which froms the maltese state is:
A. Gozo B. Corsica
C. Sardinia D. Sicily

104. Portugal is drained by river:
A. Gaudalquiver B. Ebro
C. Tagus D. All the above

105. Which country does not share a boundary with Germany?
A. Poland
B. Hungary
C. Luxembourgh
D. Switzerland

106. **Assertion (A):** The continent of Europe can be described as a peninsula of Peninsulas.
Reason (R): Europe is composed of several important peninsulas.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

107. Europe is located between:
A. 18° to 30°N latitude
B. 20° to 45°N latitude
C. 35° and 70°N latitude
D. 45° to 80°N latitude

108. Which country is experiencing practically no growth in its population?
A. Switzerland
B. Italy
C. U.K.
D. None of these

109. Europe has only.....of the land surface of the earth
A. 3% B. 7%
C. 11% D. 15%

110. Which of the following mountain range in Europe has the fame of having the loftiest peak, MFEL brus?
A. Caucasus B. Ural
C. Balkan D. Pyrene

ANSWER

1	2	3	4	5	6	7	8	9	10
C	C	D	D	A	A	B	A	A	B
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
D	A	A	B	A	A	A	B	B	C
21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
A	D	C	A	B	B	B	D	A	A
31	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
A	D	A	B	A	A	B	A	A	D
41	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**
B	A	A	A	C	D	B	B	A	A
51	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
C	A	D	C	A	D	A	A	A	C

61	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**
C	A	A	D	A	C	A	D	B	D
71	**72**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**
D	A	D	A	D	A	A	A	A	A
81	**82**	**83**	**84**	**85**	**86**	**87**	**88**	**89**	**90**
A	A	D	A	C	B	A	A	C	A
91	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**100**
D	A	A	A	C	C	B	A	C	A
101	**102**	**103**	**104**	**105**	**106**	**107**	**108**	**109**	**110**
C	E	A	C	B	A	C	A	B	A

13 Africa

1. The second largest producer of diamond in the World is:
   A. Zaire (now Congo)
   B. Botswana
   C. Namibia
   D. Ethiopia
2. Kimberlay mine in South Africa is the World largest mine of:
   A. Gold B. Silver
   C. Diamond D. Pearl
3. Bushman is associated with:
   A. Kalahari desert
   B. Congo basin
   C. Himalaya Mountains
   D. Malwa Plateau
4. Which of the following breeds of sheep has put south Africa on the top (second) of the world in the production of high-quality wool?
   A. Merino B. Swaledale
   C. Lincoln D. Leicester
5. Which of the following countries in Africa leads in the production of palm oil and palm kernels?
   A. Mali B. Chad
   C. Mauritania D. Nigeria
6. Which of the following regions in Africa has been devoted to cocoa cultivation?
   A. Gulf of Guinea
   B. Plateau of Ethiopia
   C. The valley of Zambezi
   D. The valley of orange
7. The water of which of the following lakes has been used for irrigation as well as generating hydro-electricity in Egypt?
   A. Lake Rudolf B. Lake Victoria
   C. Lake Nyasa D. Lake Nassar
8. **Assertion (A):** Major part of central Africa is thickly afforested.
   Reason (R): The climate of central Africa is of mediterranean type
   A. Both A and R are true and R is the correct explanation of A
   B. Both A and R are true but R is not the correct explanation of A
   C. A is true but R is false
   D. A is false but R is true
9. Which of the following diseases has traditionally limited the keeping of Livestock in many parts of Africa?
   A. Cattle fever B. Anthrax
   C. Nagana D. Rinderpest
10. Which of the following African countries produces about half (51%) of the world's cobalt production?
    A. Congo B. South Africa
    C. Sudan D. Zambia
11. Match List I with List II and select the correct answer using the code given below the lists:

List I (Sobriquet)	***List II (Metal)***
(a) Metal of hope	1. Copper
(b) Versatile metal	2. Chromium
(c) Conductivity Metal	3. Nickel
(d) Stainless metal	4. Uranium

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	1	2	3	4
B.	2	1	4	3
C.	3	4	2	1
D.	4	3	1	2

12. **Assertion (A):** Though Egypt accounts for only 3% of the world's raw cotton production, its importance in the world trade is greater than this figure suggests.

Reason (R): Egyptian cotton is of Long Staple type which is used for the manufacture of high quality textiles and cotton thread for sewing.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

13. **Assertion (A):** Cape province in South Africa is the only area in Africa where viticulture is practised.
Reason (R): Mediterranean type of climate in Africa is found only in cape province
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

14. Which of the following African countries is a major producer of tea?
A. Ethiopia B. Kenya
C. Egypt D. Morocco

15. As Nile Valley is to Egypt, so is orange valley to:
A. Libya. B. Nigeria.
C. South Africa. D. Sudan.

16. **Assertion (A):** In June-July it is summer in the north and winter in the south of Africa while in December-January case is reversed.
Reason (R): The continent of Africa lies on either side of the Equator.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

17. The largest producer of diamond in Africa is:
A. Zaire B. Namibia
C. South Africa D. Botswana

18. Copper Belt of Katanga lies in:
A. Ethiopia and Somalia
B. Namibia and Botswana
C. Zaire and Zambia
D. Morocco and Mauritania

19. Which one is the most important copper mines of Zaire (Africa)?
A. Witwatersrand B. Kimberley
C. Katanga region D. Johansburg

20. The major producers of Rubber in Africa are:
A. Namibia, Zambia and Zimbabwe
B. Algeria, Libya and Egypt
C. Somalia, Ethiopia and Sudan
D. Liberia, Nigeria and Ivory Coast

21. Which of the following countries of Africa is known all over the world for its pyramids and the sphinx?
A. Kenya B. Algeria
C. Morocco D. Egypt

22. Which of the following is the largest desert of the world?
A. The Atacama B. The Gobi
C. The Sahara D. The Kalahari

23. **Assertion (A):** High quality temperature cattle breeds cannot be kept usually in tropical regions of Africa.
Reason (R): Temperate cattle breeds do not posses resistance to certain tropical diseases.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

24. Hassi R'mel one of the largest natural gas fields of the world is situated in:
A. Nigeria B. Libya
C. Algeria D. Somalia

25. Which of the following African cities has the distinction of being the largest gold mining centre in the world?
A. Lagos B. Dodoma
C. Khartoum D. Johannesburg

26. Which of the following countries is traditionally known as the gift of the Nile?
A. Egypt B. Zaire
C. Somalia D. Sudan

27. Match List I with List II and select the correct answer using the code given below the lists:

List I (Lakes)	***List II (Countries)***
(a) Rudolf	1. Mozambique
(b) Kiogo	2. Zimbabwe
(c) Kariba	3. Kenya
(d) Cobora Bassa	4. Uganda

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	4	2	1	3
B.	3	4	2	1
C.	2	1	3	4
D.	1	3	4	2

28. **Assertion (A):** Much of the central and southern Africa is poor in oil.
Reason (R): Central and southern Africa consist of ancient crystalline rocks?
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

29. Which of the following African countries is the largest producer of Vanadium, which is used as a scavenging agent (removing non-metallic impurities) in making steel, in the world.
A. South Africa B. Zaire
C. Morocco D. Zambia

30. Dohra, Beda and Zelten oil fields are situated in:
A. Libya. B. Zaire
C. Tanzania D. Botswana

31. Which of the following waterfall is situated in South Africa?
A. Gavarnie B. Tugela
C. Guaria D. Khon

32. Which of the following is the highest mountain in Africa?
A. Kilimanjaro
B. Drakensberg
C. Atlas
D. Ruwenzori

33. Which of the following African countries was formely known as Bechuanaland?
A. Namibia B. Angola
C. Botswana D. Ethiopia

34. Match List I with List II and select the correct answer using the code given below the lists:

List I	***List II***
(a) Abyssinia	1. Grambia
(b) Moanda Manganese deposit	2. Mozambique
(c) The smallest African country	3. Ethiopia
(d) Bantutribe	4. Gabon

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	3	2	1	4
B.	1	2	3	4
C.	4	3	2	1
D.	3	4	1	2

35. Where in Africa would you find Mahgreb?
A. Moorish Africa, Morocco, Algeria and Tunisia
B. Along the mediterranean coast of Africa
C. In the Nile valley
D. Libya and Egypt

36. Which of the following lake is situated in Ghana?
A. Lake Victoria
B. Lake Malawi
C. Lake Volta
D. Lake Tanganyika

37. In cape province which crop is the most important?
A. Sugarcane B. Banana
C. Grapes D. Pinapples

38. Witwatersrand is famous for:
A. uranium B. coal
C. diamond D. gold

39. Diamond in the South Africa is mined at:
A. Transvaal B. Cape province
C. Namibia D. All of them

40. Swahili is a:
A. Mountain in the west Africa
B. Kind of African food
C. Tribe of the west Africa
D. Bantu Language

41. Owen falls dam is on river:
A. Nile
B. Orange
C. Congo
D. Niger

42. The highest mountain of Africa is:
A. Mt. Kilimanjaro
B. Mt. Ngorogoro crater
C. Mt. Ruwenzori
D. Mt. Kirinyaga

43. Where is the Nubian desert located?
A. Egypt B. Sudan
C. Nigeria D. Ethiopia

44. The Shaba region is world's largest producer of:
A. Diamond B. Copper
C. Cobalt D. Silver

45. Pagalu is linked with which west African country?
A. Equatorial Guinea
B. Cameroon
C. Gabon
D. Congo

46. Which is the largest lake in the west Africa?
A. Lake Faguibire B. Lake Kainji
C. Lake Volta D. Cameroon Lake

47. The western most major city in Africa is
A. Dakar B. Banjul
C. Nouakchott D. Casablanca

48. What is Nigeria's main export?
A. Oil B. Gold
C. Iron ore D. Diamond

49. On which river delta is port Harcourt located?
A. Niger B. Zaire
C. Orange D. Mali

50. The coast of which country is called the Gold Coast?
A. Nigeria B. Ethiopia
C. Mali D. Ghana

51. Shaba, which is mineral rich region is in?
A. South Africa B. Zambia
C. Zimbabwe D. Zaire

52. Which of the following mineral is not found in South Africa?
A. Gold B. Diamond
C. Uranium D. Niobium

53. East African Highlands have which type of soil?
A. Desert soil B. Volcanic soil
C. Laterite soil D. Alluvial soil

54. Another name applied especially to the steppe portions of Africa is:
A. Sahel B. Savannah
C. Inga D. Welwitschia

55. The largest single potential source of hydro electricity in Africa is the stretch of rapids on:
A. Congo river B. Niger river
C. Nile river D. Zambezi river

56. With which river do you associate the colours blue and white?
A. Nile B. Zaire
C. Zambezi D. Orange

57. Which of the following rivers do not make a delta?
A. Zambezi B. Niger
C. Limpopo D. Nile

58. The largest lake in Africa is:
A. Lake Victoria
B. Lake Tanganyika
C. Lake Chad
D. Lake Malawi

59. In the middle of which country is Timbuktu (Tomboctou)?
A. Niger B. Mauritania
C. Algeria D. Mali

60. Uganda is surrounded by 5 countries which of the following is one of them?
A. Kenya B. Somalia
C. Ethiopia D. Burundi

61. The earliest visitors to sub-saharn Africa were:
A. English B. French
C. Americans D. Portuguese

62. Following are the densely populated pockets of Africa. Mark the odd one out.
A. Surrounding of Johannesburg
B. the Nile Valley
C. Sudan
D. Highlands of Ethiopia

63. Which country is completely land located in South Africa?
A. Lesotho B. Swaziland
C. Zimbabwe D. Botswana

64. **Assertion (A):** The transvaal region produce citrus fruits in large amounts.
Reason (R): It has long-free season.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

65. The northern part of the transvaal is an area of woodlands and savanna grasses. It is also known as:
A. Savannah veld B. Bush veld
C. High veld D. Great karoon

66. The Giant Kariba Dam is located on..... river.
A. Orange B. Congo
C. Zambezi D. Niger

67. The comoro islands are of.....river.
A. Glacial B. Mauritius
C. Coral D. Sand deposits

68. Zambia's largest city and capital is:
A. Lusaka B. Livingstone
C. Nodola D. Kabwe

69. Which island nation lies between Madgascar and the African mainland?
A. Comoros B. Zanzibar
C. Seychelles D. Mali

70. Which island is known as clove island?
A. Zanzibar B. Pemba
C. Medagascar D. Comoro

71. The island of Zanzibar and Pemba are a part of which country.
A. Mozambique B. Somalia
C. Kenya D. Tanzania

72. The largest and most important industrial centre in the east Africa is:
A. Nairobi B. Bujumbura
C. Jinja D. Mogadishu

73. Which of the following country does not lie between the Congo basin and the Indian Ocean?
A. Uganda B. Somalia
C. Tanzania D. Kenya

74. Lake Tanganyika was formed as a result of:
A. volcanic explosion
B. syncline formation
C. deflation
D. rifting

75. Two neighbouring African countries get their names from a river they share. What is the name of the river?
A. Niger B. Zaire
C. Orange D. Zambezi

76. Africa's greatest shipping port of Bauxite and Alumina—commodities is:
A. Accra B. Queen mary
C. Conakry D. Lagos

77. Ghana's new modern deep water-port has been developed as:
A. Abidyan B. Accra
C. Tema D. Kumasi

78. The largest urban centre in the west-Africa is:
A. Ibadan B. Lagos
C. Accra D. Abidjan

79. Which country in Africa is the largest producer of Natural rubber?
A. Ghana B. Liberia
C. Nigeria D. Ivory Coast

80. Which African country leads in coffee export?
A. Ethiopia B. Ghana
C. Liberia D. Nigeria

81. What is not true about Bushmen?
A. They are dependent upon agriculture.
B. They are found primarily in the Kalahari region
C. They are also called San
D. They are taller than Pygmies

82. Match the following:

(a) Nigeria	1. Petroleum
(b) Liberia	2. Iron ore
(c) Guinea	3. Bauxite
(d) Ghana	4. Diamonds

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	1	2	3	4
B.	2	3	1	4
C.	1	3	2	4
D.	4	3	1	2

83. Principal African mineral producing countries are the following except and Alumina—commodities is:
A. Somalia B. Namibia
C. Libya D. South Africa

84. In Africa the hippopotamus are mainly found in the:
A. Temperate grasslands
B. Savanna
C. Tropical rain forests
D Tropical grassland

85. Match the following:

(a) South Africa	1. Copper
(b) Morocco	2. Oil and Natural gas
(c) Zaire	3. Uranium
(d) Libya	4. Phosphate

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	3	2	1	4
B.	2	1	3	4
C.	3	4	1	2
D.	3	4	1	2

86. Which nation of island is to the west of the Central African Coast?
A. Sao Tome E. Principe
B. Pagalu
C. Cabinda
D. Equatorial Guinea

87. Which was the occupying power in the Western Sahara and which is the present power?
A. Germany and Morocco
B. France and Algeria
C. France and Mauritania
D. Spain and Morocco

88. Which of the following desert is not in Africa?
A. Sonoran desert
B. Sahara desert
C. Kalahari desert
D. Namib desert

89. What is true about tropical soils?
A. They are poor in plant nutrients
B. They tend to lose their fertility quickly when used for crops
C. They are usually low in humus
D. All of these

90. Which national park has been made to conserve the remaining wildlife in the extreme north-east of South Africa?
A. Kruger National Park
B. Serengeti National Park
C. Accra National Park
D. Keoladeo National Park

91. What is not true about pygmies?
A. Average height is around 41/2 feet.
B. They are found principally in the tropical rainforests of the Congo basin.
C. They lived by hunting and gathering
D. They have settled in lands previously occupied by Bantus.

92. In slave trading days which place had a notorious reputation had the largest west African port for the slave traffic to the new world?
A. Dakar B. Conakry
C. Lagos D. Freetown

93. The most important commercial and administrative centre of Nigeria which has also been a major West African focus of Islamic culture is:
A. Kano B. Lagos
C. Abuja D. Ibadan

94. Which island is/are located in the east of Medagascar?
A. Seychelles B. Reunion
C. Mauritius D. Both A and B

95. Lake Chad seasonally extends into other countries they are:
A. Libya and Niger
B. Central African Republic and Sudan
C. Niger, Nigeria and Cameroon
D. Cameroon, Central African Republic and Sudan

96. In South Africa the plateau surface is the highest towards:
A. West B. East
C. South D. North

97. Vaal is a tributary of river:
A. Limpopo B. Niger
C. Orange D. Congo

98. Which of the following mineral resources are not found in transvaal?
A. Bauxite B. Coal
C. Manganese D. Iron ore

99. Cape Town, Pretoria and Bloemtontein are South African cities with some thing in common what is it?
A. All are gold mining centres
B. All cities are located on coasts
C. All are national capitals (administrative, legislative and judicial)
D. All are provincial capitals

100. Where are the Makarikari salt pans found?
A. Botswana B. Namibia
C. South Africa D. Zambia

101. As champagne is to France, so is vin ordinaire to:
A. Algeria B. Tanzania
C. Zaire D. Mali

102. Which of the following African countries is an industrially developed country?
A. Sudan B. Egypt
C. Zambia D. South Africa

103. Tanzara Railway, built with Chinese aid, is now under the control of:
A. Mozambique and Somalia
B. Tanzania and Zaire
C. Nigeria and Cameroon
D. Namibia and Botswana

ANSWER

1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
B	A	A	A	D	A	D	C	C	A
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
D	A	A	B	C	A	D	C	C	D
21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
D	C	A	C	D	A	B	A	A	A
31	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
B	A	C	D	A	C	A	B	D	D
41	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**
A	A	A	C	A	C	A	A	A	D
51	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
D	D	B	A	A	A	C	A	D	A
61	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**
D	C	A	D	D	B	A	D	A	A
71	**72**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**
C	A	B	D	A	C	C	B	D	A
81	**82**	**83**	**84**	**85**	**86**	**87**	**88**	**89**	**90**
A	A	A	C	D	A	D	A	D	A
91	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**100**
D	C	A	C	A	C	D	C	D	A
101	**102**	**103**							
A	D	B							

14 North America

1. Which continent of the World has the maximum known coal reserves?
   A. North America B. South America
   C. Australia D. Africa
2. Which one of the following has maximum farmhouses?
   A. India B. USA
   C. China D. Japan
3. Which pair is incorrect?
   A. Fohn – Dry and warm wind
   B. Chinook – Snow eater
   C. Mistral – Winter season
   D. Bora – North America
4. The magnificent and still active volcano momotombo is situated in:
   A. Nicaragua B. Guatemala
   C. El Salvador D. U.S.A.
5. Chicle, the juice of the Sapodill a which is used for the manufactured of chewing gum, is a major export item of:
   A. Nicaragua B. Honduras
   C. Mexico D. Belize
6. Henequen which yields valuable fibres is chiefly grown in:
   A. Mexico B. Nicaragua
   C. El-salvador D. Cuba
7. Which of the following cities of U.S.A. was formely known as New Amsterdam?
   A. San Francisco B. Chicago
   C. Pittsburg D. New York
8. In which of the following regions, aeroplanes often make use of Lakes and rivers for landing?
   A. Northern Canada
   B. Northen Mexico
   C. Southern U.S.A.
   D. Eastern U.S.A.
9. In how many time zones is Canada divided?
   A. Two B. Three
   C. Four D. Five
10. Edmonton and Crow's Nest passes, situated in the province, Alberta are the principle.....producing sites.
    A. Zinc B. Iron
    C. Coal D. Copper
11. The strong and cold winds in the northen parts of Canada which are accompanied by snow storms are called:
    A. Mistrals B. Chinooks
    C. Westerlies D. Blizzards
12. **Assertion (A):** The climate of the interior of North America is warmer in summner and colder in the winter than corresponding latitudinal positions on the coasts.
    Reason (R): The interior of North America is beyond oceanic influences.
    A. Both A and R are true and R is the correct explanation of A
    B. Both A and R are true but R is not the correct explanation of A
    C. A is true but R is false
    D. A is false but R is true
13. Which of the following rivers is famous for its mighty canyon?
    A. Colombia B. Colorado
    C. Skeena D. Yukon
14. Golden Gate, the longer (1.6 km) single span suspension bridge in the world, is situated in
    A. New York B. San francisco
    C. Los Angles D. Washington D.C.

15. Match List I with List II and select the correct answer using the code given below the lists—

List I	***List II***
(a) Pico de Orizaba	1. U.S.A.
(b) Death valley	2. Nicaragua
(c) Italco	3. El-Salvador
(d) Gulf of Fonseca	4. Mexico

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	1	2	3	4
B.	1	3	2	4
C.	2	4	1	3
D.	4	1	3	2

16. Which of the following items of Havana is world famous?
A. Perfume B. Cheese
C. Cigar D. Chocolate

17. Which of the following capital cities is designed in the shape of across owing to the meaning of its name—Holy Saviour or Christ?
A. San salvador B. Tegu cigalpa
C. Guatemala city D. Belmopan

18. The term depths is used for which of the following countries?
A. Honduras B. Nicaragua
C. Guatemala D. Mexico

19. The popocatepti (smoking mountain) and ixtacihuati (sleeping woman) ranges are situated in:
A. Canada B. Cuba
C. Mexico D. El Salvador

20. Hibbing iron-ore mines are situated in:
A. Mexico B. Canada
C. U.S.A. D. Cuba

21. Sudbury, situated north of Lake Huron in Canada, is the richest mining area of:
A. Asbestos and Tin
B. Uranium and Gold
C. Silver and Zinc
D. Nickel and Copper

22. Beauharnois and Keman in Canada are the principal—producing sites of:
A. Hydro-electricity
B. Coal reserves
C. Fish processing
D. Pulp and paper manufacturing

23. British Columbia is noted for its..... fisheries:
A. Lobster B. Herring
C. Cod D. Salmon

24. **Assertion (A):** In north America the west and east flowing rivers are suited for the generation of hydro-electricty.
Reason (R): East and west flowing rivers in North America are long and slow flowing.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

25. Richardson Range of Rockey mountains lie in:
A. Cuba B. Canada
C. Mexico D. U.S.A.

26. **Assertion (A):** Central Californian Coast receives rain during the winter months.
Reason (R): Central Californian Coast lies under the influence of rain-bearing westerlies.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

27. **Assertion (A):** Much of the Jamaican bauxite is exported to U.S.A. and Canada for large aluminium works.
Reason (R): Jamaica does not produce sufficient amount of hydro-electricity.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

28. As Momotombo is to Nicaragua, so is Volcan Poas to:
A. Costa Rica B. Honduras
C. Guatemala D. Panama

29. The famous volcano, Izalco, which is calledthe light house of Central America is situated in:
A. U.S.A. B. Canada
C. El. Salvador D. Guatemala

30. Which of the following cities is known as the iron and the steel capital of Mexico?
A. Monterrey B. Tampico
C. Guadalajara D. Veracrut

31. Hoover Dam, constructed on the river colorado, has solved the major problem of water shortage of:
A. Chicago B. Washington
C. Los Angeles D. New York

32. Niagara falls is an important source of hydro-electricity for both:
A. El Salvador and Nicaragua
B. Mexico and Cuba
C. Jamaica and Haiti
D. Canada and U.S.A.

33. The world largest asbestos mines are situated in Canada near:
A. Schefferville B. Thet ford
C. Buchans D. Ontario

34. Soo canal is situated in:
A. U.S.A. B. Canada
C. Cuba D. Mexico

35. Which of the following Canadian regions is noted for its apple orchard?
A. Alberta, the St. Lawrence Lowland
B. The Annapolis valley
C. The St. Lawrence Lowland
D. Alberta

36. Which of the following rivers serves as a natural boundary between U.S.A. and Mexico?
A. Yukon
B. Mackenzie
C. Riogrande
D. Mississippi-Missouri

37. **Assertion (A):** The climate of the interior of North America is warmer in summer and colder in the winter than corresponding Latitudinal positions on the coasts.
Reason (R): The interior of North America is beyond oceanic influences.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

38. Which of the following rivers is famous for its mighty canyon?
A. Colorado B. Fraser
C. Yukon D. Skeena

39. **Assertion (A):** Southern California receives little or no rain.
Reason (R): Southern California falls under the rain-shadow area.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

40. **Assertion (A):** In costa Rica the rate of Literary is high.
Reason (R): Education is free and compulsory for all in Costa Rica.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

41. The shrine of the virgin of Guadalupe is situated at:
A. Mexico city B. New York
C. Chicago D. Washington D.C.

42. Which of the following cities of U.S.A. has been called by its nickname—"The Windy City"?
A. Chicago B. Pittsburg
C. San Francisco D. New York

43. Silos in Canada are used to store—prior to its distribution and export to the various markets of the world:
A. Grain B. Fish product
C. Skin D. Fish

44. In Canada, every type of mineral is found in one or other of its provinces with the exception of:
A. Tin B. Nickel
C. Zinc D. Platinum

45. Hicking Horse pass is situated in:
A. Mexico B. Nicaragua
C. Canada D. U.S.A.

46. Sonora desert is situated in:
A. Mexico and USA B. USA and Canada
C. Canada D. Cuba

47. The main export of Nicaragua is:
A. wheat B. rice
C. sugarcane D. cotton

48. Which of the following countries has been given the name—The land of wood and water due to expanses of forest—covered moutains and sparkling streams and waterfalls?
A. Guatemala B. Jamaica
C. Costa Rica D. Haiti

49. In mineral wealth, Mexico leads the world in the production of:
A. tin B. silver
C. copper D. phosphorous

50. **Assertion (A):** The majority of buildings in managua, the capital of Nicaragua are not very high.
Reason (R): Managua is subject to frequent earthquakes.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

51. Fall line (U.S.A.) is associated with:
A. Hydro-electricity generation
B. Cattle-rearing
C. Cotton cultivation
D. Meat packing

52. **Assertion (A):** The film making industry is centred around Los Angeles.
Reason (R): Los Angeles has brilliant sunshine and long spells of dry weather besides beautiful natural scenary.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

53. Catun Lake, one of the biggest man-made lakes of the world is situated in:
A. Mexico B. Canada
C. U.S.A. D. Cuba

54. Jamaica is the world's leading producer of:
A. Silver B. Phosphorous
C. Copper D. Bauxite

55. Lumbering is associated with:
A. sheep-rearing B. hunting
C. forest activities D. bee-keeping

56. In Canada the extensive type of farming is mainly confined to the:
A. Cultivated areas of British Columbia
B. St. Lawrence lowlands
C. Great lakes region
D. Prairie provinces

57. Which of the following states of U.S.A is known as the sunshine state?
A. Florida B. Kansas
C. Louisiana D. Texas

58. The rivers St. Lawrence, Hudson and Potomac flow into the:
A. Bering Strait B. Arctic Ocean
C. Atlantic Ocean D. Hudson Bay

59. The highest peak in the North America is
A. Mt. Mackenzie
B. The Sierra Neveda
C. Mt. Mckinley
D. Mt. Cascade

60. Which of the following crops accounts for 70% of the revenue of Guatemala?
A. Sugarcane B. Rice
C. Coffee D. Tobacco

61. The largest producer of solar cells in the world is .....
A. The U.S.A.
B. Canada
C. Guatemala
D. Mexico

62. Copper in the U.S.A. is mined in the states of:
A. Arizona B. Montana
C. New Mexico D. All of these

63. Salmon is the main fish catched on the:
A. Pacific Coast of the U.S.A.
B. North Sea of Norway
C. Grand Banks of the Atlantic Coast
D. None of these

64. The direction of St. Lawrence river of Canada is:
A. Southwards B. Eastwards
C. Northwards D. Westwards

65. The Colorado river of the U.S.A. flows:
A. Northwards
B. Southwards
C. North-eastwards
D. Eastwards

66. The river Yokon in the U.S.A. flows:
A. Eastwards B. Northwards
C. Westwards D. Southwards

67. The federal capital of the U.S.A. is:
A. Washington D.C.
B. New York
C. Boston
D. Los Angeles

68. In the U.S.A. about 75% people live in the:
A. Western half B. Northern part
C. Southern part D. Eastern half

69. Most of the industries of the U.S.A. are concentrated in the:
A. North-east B. South
C. North D. South-east

70. Around 3/4th of coal of the U.S.A. is mined in:
A. Central highlands
B. The Applachian coal fields
C. Rockies
D. None of these

71. The most important iron-ore mining area lies around the:
A. Lake Michigan B. Lake Ontario
C. Lake Superior D. Lake Erie

72. Canada is the.....largest country in the world.
A. Third B. Fifth
C. Second D. Fourth

73. The Canada's topography is dominated by the:
A. Rockies
B. The Applachian highlands
C. Canadian shield
D. None of the above

74. On the pacific coastal belt the winters are mild because:
A. of the influence of the warm North Pacific drift
B. of the influence of the rain shadow area of the Rockies
C. of the influence of the warm Atlantic current
D. None of the above

75. The leading fur market of Canada is:
A. Hamilton B. Windsor
C. Montreal D. Toronto

76. The main catch on the Grand Bank is:
A. Cod B. Solmon
C. Tuna D. Sardines

77. Winnipeg is a big centre of:
A. wheat trade
B. lumbering
C. fur trade
D. None of these

78. Canada leads the world in the production of:
A. Uranium B. Gypsum
C. Iron-ore D. Coal

79. Dairy farming is an important industry in:
A. The humid region of the Great Lakes
B. The St. Lawrence Valley

C. Both A and B
D. Winnipeg

80. About 3/4 of Canada's present power needs are met by energy:
A. generated from coal
B. generated from petroleum
C. generated from nuclear power plants
D. generated from water power

81. Windsor in Canada is noted for its:
A. Automobile industry
B. Tyre-making industry
C. Both A and B
D. Iron and steel industries

82. The chief industry of Kingston in Canada is:
A. ship-building
B. aircraft manufacturing
C. electrical engineering
D. locomative manufacturing

83. The largest city of Canada is:
A. Kingston B. Montreal
C. Toronto D. Hamilton

84. The 3/4 of the Canadian population live in only two cities which are they?
A. Montreal and Ontario
B. Quebec and Montreal
C. Quebec and Ontario
D. Montreal and Quebec

85. Alaska is a part of:
A. Canada
B. The U.S.A.
C. both Canada and the U.S.A.
D. independent state

86. The coast ranges are located in:
A. The western part of the U.S.A.
B. The eastern part of the U.S.A.
C. The U.S.A.
D. Canada

87. The Grand Canyon Waterfall is located on:
A. The Snake River
B. The Colombia River
C. The Mississippi River
D. The Colorado River

88. Canada has a very long border with the United States:
A. in the south and east
B. in the south and the west
C. in the north and the west
D. in the north and the east

89. The St. Lawrence River lies in the:
A. north west of Canadian shield
B. north-east of the Canadian shield
C. south east of the Canadian shield
D. None of the above

90. Small stunted coniferous trees begin to appear in Canada in:
A. south of Taiga
B. south of Tundra
C. north east of Tundra
D. north of the Canadian shield

91. Felling of trees in Canada is done by the Lumber Jacksin:
A. late winter B. spring
C. autumn D. early winter
E. both C and D

92. More than.....% of Canada's farmland lies in western Canada.
A. 80% B. 50%
C. 40% D. 20%

93. The Birmingham of Canada is:
A. Quebec B. Montreal
C. Toronto D. Hamilton

94. Malton in Canada specialises in:
A. cotton textiles
B. automobiles
C. aircraft manufacturing
D. fur industry

95. Vancouver on the Pacific coast is a centre for:
A. lumbering
B. timber industries
C. fish canning
D. all of the above

96. The Sierra Nevada is in:
A. north-eastern part of the U.S.A.
B. south-western part of the U.S.A.
C. south-eastern part of the U.S.A.
D. None of these

97. The Colombia and Colorado Plateaus are drained by:
A. the Snake and the Mississippi rivers respectively

B. the Snake and the Colorado rivers respectively
C. the Colorado and the Snake rivers
D. The Mississippi and the Snake rivers respectively

98. Why is the Akron region of U.S.A. famous?
A. Chemical industry
B. Wheat milling
C. Automobile industry
D. Food processing

99. The driest part of the U.S.A. is:
A. The south-east
B. The north west
C. The south west
D. The north east

100. The most important cereal crop of the U.S.A. is:
A. maize B. wheat
C. rice D. none of these

101. Which of the following is associated with New York?
A. The Statue of Liberty
B. The Golden Gate
C. The Iron Gate
D. The Hoover Dam

102. Match List I with List II and select the correct answer using the code given below the lists:

List I	***List II***
(a) Volcan irazu	1. Mexico
(b) Ejidos	2. Haiti
(c) Sanpedrosula	3. Costa Rica
(d) Descendants of Slaves	4. Honduras

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	3	1	4	2
B.	4	3	2	1
C.	1	4	3	2
D.	2	1	4	3

103. Ungava Peninsula is a part of:
A. Canada B. USA
C. Mexico D. Honduras

ANSWER

1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
A	B	D	A	D	A	D	A	D	C
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
D	A	D	C	B	A	A	A	C	A
21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
C	D	B	B	B	C	A	A	A	A
31	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
C	D	B	B	B	C	A	A	A	A
41	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**
A	A	A	A	C	A	D	B	B	A
51	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
A	A	D	D	C	D	A	C	C	C
61	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**
A	D	A	B	B	C	A	D	A	B
71	**72**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**
C	C	C	A	C	A	A	A	C	D
81	**82**	**83**	**84**	**85**	**86**	**87**	**88**	**89**	**90**
C	D	B	C	B	A	D	B	C	B
91	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**100**
C	A	D	C	D	B	B	C	B	A
101	**102**	**103**							
A	A	A							

15 South America

1. The longest river of South America–
A. Nile B. Amazon
C. Mississippi D. Colombia

2. Match List-I with List-II and select the correct answer using the codes given below the lists:

List-I (Country)	***List-II (Capital City)***
(a) Argentina	1. Buenos Aires
(b) Brazil	2. Caracas
(c) Peru	3. Lima
(d) Venezuela	4. Sao Paulo

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	1	3	4	2
B.	1	4	3	2
C.	2	3	4	1
D.	2	4	3	1

3. Match List I with List II and select the correct answer using the code given below the lists—

List I (Mineral)	***List II (Country)***
(a) Copper	1. Brazil
(b) Tin	2. Surinam
(c) Bauxite	3. Bolivia.
(d) Iron ore	4. Chile

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	2	1	4	3
B.	1	4	3	2
C.	4	3	2	1
D.	3	2	1	4

4. Which of the following is the highest active volcano in the world?
A. Guallatiri (chile)
B. Cotopaxi (Equator)
C. Nevado del Ruiz (Colombia)
D. Lascar (Chile)

5. Which of the following South American countries are land-locked?
A. Bolivia and Paraguay
B. Brazil and Uruguay
C. Argentina and Chile
D. Chile and Bolivia

6. **Assertion (A):** South America together with Central America and Mexico is called Latin America.
Reason (R): The main languages of these lands are Spanish and Portuguese which are derived from Latin.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

7. The coast of Peru and Chile are famous for.....fish.
A. Catla B. Cod
C. Herring D. Anchovies

8. Guano, a manure found on the islands of the coast of Chile, which contains all the ingredients of plant food, is derived from
A. Cow dung
B. Bird's faecal matter
C. Bones of animal
D. Green algae

9. The highest mountain peak of the Andes is:
A. A concagua B. Huascaran
C. Chimborazo D. An co huma

10. Which of the following South American countries leads the continent in the production and export of Beef?
A. Brazil B. Argentina
C. Peru D. Chile

11. An argentina slaughter-houses are called:
A. Frigorificos B. Gauchos
C. Chacras D. Tasajos

12. The large plantation farms of coffee are known as—in Brazil.
A. Corrals B. Fazendas
C. Estancia D. Paddocks

13. Which of the following countries of South America are non Latin:
A. Guyana and Surinam
B. Brazil and Argentina
C. Venezuela and Colombia
D. Chile and Bolivia

14. Fishing is an important industry of:
A. Bolivia B. Praguay
C. Peru D. Venezuela

15. The forests along the eastern slopes of the high Andes are known as:
A. Montana B. A cadian
C. Boreal D. Thuriringean

16. The leading producer of wheat in South America is:
A. Argentina B. Colombia
C. Chile D. Brazil

17. Which of the following is not correctly matched?
A. An ancient mammal of South America..... Armadillo
B. An animal of prey of South America..... Jaguar
C. A very large python of South America..... Rhea
D. The largest bird of prey in the world..... Candor

18. Which of the following trees of South America yields leaves which are brewed like tea?
A. Carnauba palm B. Parana pine
C. Yerba D. Quebracho

19. Which of the following trees is an important source of tannic acid used in tanning leather?
A. Quebracho B. Parana Pine
C. Yerba D. Carbauba palm

20. **Assertion (A):** There is a very little trade on the east-west South Atlantic route between Riode Janeiro and Cape Town.
Reason (R): Both Africa and South America have similar products and resources.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

21. Match List I with List II and select the correct answer using the code given below the lists—

List I (Physical feature)	***List II (Region)***
(a) Lionos	1. North Chile
(b) Selvas	2. Orinoco Basin
(c) Campos	3. Equatorial region of Amazon Basin
(d) Atacama Desert	4. Brazilian High Lands

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	1	2	3	4
B.	4	1	2	3
C.	2	3	4	1
D.	3	4	1	2

ANSWER

1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
B	B	C	B	A	A	D	B	A	B
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
A	B	A	C	A	A	C	C	A	A
21									
C									

16 Australia, Antarctica And New Zealand

1. Maoris are the original inhabitants of:
   A. Greenland B. Canada
   C. Newzealand D. Java Island
2. **Great Barrier Reef** is situated near:
   A. South America B. Europe
   C. Australia D. Africa
3. **Dakshin Gangotri** is located in:
   A. Uttarakhand B. Aractic
   C. Himalaya D. Antarctica
4. Which one among the following countries is the largest producer of Bauxite?
   A. Australia B. Brazil
   C. West Indies D. India
5. Kalgoorlie and Coolgardie in Australia are famous for:
   A. Gold fields B. Iron fields
   C. Coal fields D. Copper fields
6. The highest mountain peak of New Zealand is:
   A. Mt. Eg Mont B. Mt. Isa
   C. Mt. Tongariro D. Mt. Cook
7. Bauxite deposits in Australia are found mainly in:
   A. Tasmania and Victoria.
   B. New South Wales and Queensland.
   C. Northern teritory and South Australia.
   D. North western Australia and Cape York peninsula.
8. **Assertion (A):** In Australia most of the Agricultural work is done by machines.
   Reason (R): The population of Australia is very small.
   A. Both A and R are true but R is the correct explanation of A
   B. Both A and R are true but R is not the correct explanation of A
   C. A is true but R is false
   D. A is false but R is true
9. The highest peak of Australia is:
   A. Blue mountain B. Mt. Woodroffe
   C. Mt. Ord D. Mt. Kosciusko
10. The largest reserves of coal in Australia occur in:
    A. Victoria
    B. Tasmania
    C. Queensland
    D. New South Wales
11. **Assertion (A):** No animal or plant life is found on the mainland of Antarctica.
    Reason (R): The main land of Antarctica is covered with huge masses of snow and ice.
    A. Both A and R are true and R is the correct explanation of A
    B. Both A and R are true but R is not the correct explanation of A
    C. A is true but R is false
    D. A is false but R is true
12. Which of the following is the highest peak of Antarctica?
    A. Vinson Massif B. Mt. Levick
    C. Mt. Emundson D. Mt. Christensen
13. The coldest place in the world which lies in Antarctica and recorded a temperature of 127° F is:
    A. Vostok station B. Ifrane
    C. Charlottle pass D. Ojmyakon
14. The first Indian expedition on Antarctica in 1981-82 under the leadership of Dr. S. L. Qasim landed near.....and named it as Dakshin Gangotri (Mt. Indira).
    A. Byrd land B. Queenmaud land
    C. Palmer land D. Drygalski
15. Antarctica contains about.....fresh water reserves of the world.
    A. 30% B. 10%
    C. 45% D. 60%

16. Which of the following birds dominates the Antarctica?
A. King fisher B. Ostrich
C. Kiwi D. Penguin

17. Which of the following oceans does not surround the Antarctica?
A. Arctic Ocean B. Indian Ocean
C. Pacific Ocean D. Atlantic Ocean

18. Which of the following bays are located along both sides of the Vinson Massif, the highest peak in Antarctica?
A. Red Sea and Baltic Sea.
B. North Sea and Black Sea
C. Bering Sea and Sea of Okhotsk
D. Ross Sea and Weddel Sea.

19. In area, Antarctica ranks.....among the continents of the world
A. First B. Third
C. Fourth D. Fifth

20. **Assertion (A):** The whole continent of Antarctica remains covered with very thick layer of ice throughout the year.
Reason (R): The temperature of Antarctica hardly rises above 4°C
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

21. What ocean is on Australia's west coast
A. Indian Ocean B. Atlantic Ocean
C. Antarctica D. Pacific Ocean

22. Which one of these would you not find on New Zealand's south island?
A. Fiords B. Glaciers
C. Mountains D. Jungle

23. Which one of the following is Australia's most important agriculture product?
A. Wheat B. Beef
C. Wool D. Corn

24. Which part of Australia contains the greatest desert area?
A. the southern half
B. the eastern half
C. the northern half
D. the western half

25. What continent would you meet. If you were to sail directly east of Australia?
A. Asia B. Africa
C. South America D. North America

26. The typical tree of Australia.
A. Eucalyptus B. Teek
C. Oak D. Pine

27. The western part of Australia is:
A. highland B. lowland
C. plateau D. mountain

28. Why is Australia an important exporter of wheat?
A. It produces large amount of wheat
B. only what is produced by agriculture
C. Wheat is not a staple food in Australia
D. They produce wheat more than their consumption

29. The largest number of.....are found in the downs of Australia.
A. Sheep B. Cows
C. Goats D. Camel

30. Ires rock is a part of:
A. great dividing range
B. eastern highland
C. great divide
D. none of these

31. Where opens Bay of Carpentria?
A. Timor Sea B. Tasman Sea
C. Luibin Isthumus D. Arafura Sea

32. Western coast of Australia is high.
A. Luibin to Perth
B. Perth to Disco
C. Perth to Bay of Arafura
D. Himarsali to Mackdonal range

33. Where is located the highest peak of Australia?
A. Australian Alps
B. Tasmania
C. Eastern highlands
D. Great dividing range

34. Major problems are Australian agriculture:
A. lack of water in internal part of Australia
B. Continuous and irregular rain
C. Soil hrass
D. all of the above

35. Kimberley Plateau is situated in which part of Australia?
A. Queensland
B. New South Wales
C. Western Australia
D. South Australia

36. Where wool doesn't produce?
A. Western Australia
B. Queenceland
C. South Australia
D. New South Wales

37. Match the following:

(a) Sugarcane	1. Victoria
(b) Cotton	2. Queenceland
(c) Tobacco	3. Western Australia

Codes:

	(a)	*(b)*	*(c)*
A.	1	2	3
B.	2	3	1
C.	3	1	2
D.	4	1	3

38. Gipsland is known for:
A. Manganese B. Iron ore
C. Lignite D. Tin

39. Match the following:

(a) Bauxite	1. Broken Hill
(b) Iron ore	2. Vipa
(c) Nickel	3. Mt. Goldsworthy
(d) Lead and Zink	4. Green well

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	1	2	3	4
B.	2	3	4	1
C.	3	4	1	2
D.	1	4	2	3

40. Match the following:

(a) Pilbara	1. Mangnese
(b) Merini	2. Iron ore
(c) Mt. Sydney	3. Lead and Zinc
(d) Kober	4. Petroleum

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	1	2	3	4
B.	2	4	1	3
C.	3	1	2	4
D.	4	1	3	2

41. Who is the origin of the New Zealand?
A. A borigines B. Maoris
C. Kolas D. Wombat

42. What is the wordly meaning of New Zealand?
A. New Mt. Land B. Maorikis Land
C. New Sea Land D. Desert

43. Moonie in Northern Territory, port Headland in western Australia and Bass strait are associated with:
A. oil B. iron
C. coal D. tin

44. **Assertion (A):** The island of Tasmania receives plenty of rainfall througout the year.
Reason (R): Tasmania lies under the influence of the westerlies.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

45. **Assertion (A):** Cattle-rearing is mainly confined to north island in New Zealand.
Reason (R): North island receives moderate rainfall through out the year which makes the grass juicy.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

46. **Assertion (A):** Air transport is of great importance in Australia.
Reason (R): Air transaport provides immediate medical help to distant sheep stations and other farming settlements through the air ambulance system.

A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

ANSWER

1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
C	C	D	A	A	D	D	A	D	D
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
A	A	A	B	D	D	A	D	D	A
21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
A	A	A	D	C	A	C	D	A	D
31	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
D	A	A	D	C	D	B	C	B	B
41	**42**	**43**	**44**	**45**	**46**				
B	C	A	A	A	A				

17 India

1. The most important mineralized rock system of India:
A. Cuddapa system
B. Dharwar system
C. Gondwana system
D. Vindhyan system

2. The correct group of cities through which National Highway No.8 passes is:
A. Bikaner, Ajmer, Kota
B. Jodhpur, Jaipur, Bikaner
C. Jaipur, Udaipur, Ahmedabad
D. Jaipur, Pune, Udaipur

3. Which state possesses biggest coal reserve?
A. Bihar B. Jharkhand
C. Madhya Pradesh D. Orissa

4. The coastal tract of Andhra Pradesh and Tamil Nadu is called:
A. Konkan B. Coromandel
C. East Coast D. Malabar Coast

5. The highest Indian waterfall is:
A. Gokak B. Gersoppa
C. Shivasamudram D. Yenna

6. Which one of the following does not cause soil erosion?
A. River B. Deforestation
C. Weathering D. Over grazing

7. Jaduguda, Bhaten, Narwapahar and Turamdih are famous for:
A. Copper mines B. Iron-ore mines
C. Gold mines D. Uranium mines

8. **KAMINI** the thorium based reactor is situated at:
A. Tarapore B. Narora
C. Kalpakkam D. Kakrapar

9. Shapoorji Pallonji Biotech Park Genome valley is located at:
A. Bengaluru B. Earnakulam
C. Hyderabad D. Lucknow

10. Gujarat is not the biggest producer of which of the following in the country?
A. Salt B. Soda
C. Pea-nut D. Pulses

11. The state which ranks first in the production of petrochemicals is:
A. Gujarat B. Tamil Nadu
C. Maharashtra D. Kerala

12. Which of the following research reactors is not located in Trombay (Maharashtra)?
A. Apsara B. Zerlina
C. Dhruva D. FBTR

13. Which of the following is incorrectly matched?

	Institute	***Situation***
A.	National Institute of Immunology	New Delhi
B.	National Centre for Cell Science	Pune
C.	Centre for DNA Fingerprinting and Diagnostics	Hyderabad
D.	National Brain Research Centre	Dehradun

14. Hubli in Karnataka is the headquarters of which of the following railway zones?
A. South Western Railway
B. South Eastern Railway
C. South Northern Railway
D. Southern Railway

15. Which of the following is not correctly matched?

	Waterways	***Location/Situation***
A.	National water Way-1	From Allahabad to Haldia
B.	National water Way-2	From Sadia to Dhubri
C.	National water Way-3	From Kottapuram to Kollam
D.	National water Way-4	From Ajmer to Ahmedabad

16. Consider the following statements:
Assertion (A): India is a Monsoon country.
Reason (R): The high Himalayas impart it climatic distinctiveness.
Select the correct answer using the code given below:
Codes:
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

17. Which one of the following is the first National Park established in India?
A. Bandipur B. Corbett
C. Velavadar D. Periyar

18. Consider the following regions of India:
1. Western Ghats
2. Aravalli Hills
3. Eastern Himalayan
Which of the above is/are biodiversity hot spot/hot spots?
A. 1 only B. 1 and 3 only
C. 2 and 3 only D. 1, 2 and 3

19. Which one among the following states has the highest gender disparity:
A. Orissa B. Uttar Pradesh
C. Haryana D. Maharashtra

20. Which one of the following pairs is not correct by matched?

	River	***City***
A.	Gomti	Lucknow
B.	Saryu	Ayodhya
C.	Alaknanda	Badrinath
D.	Narmada	Satna

21. In which one of the following islands of India is and active volcano found?
A. Car nicobar Island
B. Nancowry Island
C. Barren Island
D. Maya Bunder Island

22. Match List-I with List-II and select the correct answer using the codes given below the lists:

	List-I (Pass)	***List-II (State)***
(a)	Zojila Pass	1. Sikkim
(b)	Baralacha Pass	2. Uttarakhand
(c)	Jelepla Pass	3. Himachal Pradesh
(d)	Niti Pass	4. Jammu and Kashmir

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	4	1	3	2
B.	2	3	1	4
C.	4	3	1	2
D.	2	1	3	4

23. Which one of the following is the oldest mountain range in India?
A. Himalayas B. Aravalli
C. Satpura D. Nilgiri

24. Which one of the following is the longest National highway in India?
A. NH-2 B. NH-44
C. NH-8 D. NH-31

25. Which one of the following sequences of the oil refineries of India as they occur from south to north is correct?
A. Kochi - Mangalore - Mumbai - Koyali
B. Koyali - Mumbai - Mangalore - Kochi
C. Kochi - Mumbai - Mangalore - Koyali
D. Mangalore - Kochi - Mumbai - Koyali

26. Which one of the following pairs is not correctly matched?

	National Park	***State***
A.	Kanha National Park	Madhya Pradesh
B.	Sultanpur National Park	Haryana
C.	Ranthambore National Park	Gujarat
D.	Bandipur National Park	Karnataka

27. Which one of the following states of India is the largest producer of lignite coal?
A. Maharashtra
B. Gujarat
C. Madhya Pradesh
D. Tamil Nadu

28. Match List-I with List-II and select the correct answer using the codes given below the lists:

List-I (River)	***List-II (Tributary)***
(a) Brahmaputra	1. Musi
(b) Krishna	2. Tawa
(c) Narmada	3. Bhavani
(d) Cauvery	4. Dikhow

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	4	2	1	3
B.	4	1	2	3
C.	3	2	1	4
D.	3	1	2	4

29. Which one of the following oil fields of India is the oldest and still producing oil?
A. Bombay High B. Digboi
C. Ankleshwar D. Naharkatiya

30. Which one of the following states is the largest producer of black pepper in India.
A. Tamil Nadu B. Kerala
C. Karnataka D. Andhra Pradesh

31. The approximate age of the Aravalli range is:
A. 370 million years
B. 670 million years
C. 470 million years
D. 570 million years

32. Match List-I with List-II and select the correct answer using the codes given below the lists:

List-I (Multipurpose River Project)	***List-II (Hydel Power station)***
(a) Rihand	1. Hirakund
(b) Gandak	2. Balimikinagar
(c) Chambal	3. Pipri
(d) Mahandi	4. Kota

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	3	4	2	1
B.	1	2	4	3
C.	3	2	4	1
D.	1	4	2	3

33. Which one of the following is the oldest industry of India?
A. Jute B. Cotton Textile
C. Tea D. Sugar

34. Golden Quadrilateral project is associated with the development of:
A. Highways B. Ports
C. Power Grids D. Tourism Network

35. In India, the state with the lowest population density is:
A. Arunachal Pradesh
B. Himachal Pradesh
C. Mizoram
D. Sikkim

36. The state having the highest scheduled caste population in India is:
A. Rajasthan B. Maharashtra
C. Madhya Pradesh D. Uttar Pradesh

37. Which one of the following crops is the major food grain in India?
A. Wheat B. Rice
C. Maize D. Pulses

38. More than one fourth (1/4) of India's Urban population lives in the two states of:
A. Andhra Pradesh and West Bengal
B. Maharashtra and Gujarat
C. Uttar Pradesh and Tamil Nadu
D. Maharashtra and Uttar Pradesh

39. The largest producer of pulses in India is:
A. Andhra Pradesh B. Bihar
C. Madhya Pradesh D. Rajasthan

40. Which one of the following statements is fake?
A. Peninsular region is geologically the oldest part of India
B. The Himalayas represent the youngest folded mountain in the world

C. The Western Coast of India has been formed by the depositional activity of rivers
D. The Gondwana rocks have the largest deposits of coal in India

41. Which one of the following regions of India, is highly affected by soil erosion?
A. Malwa Plateau
B. U.P. Tarai
C. Andhra Coast
D. Chambal Valley

42. Which one of the following states has the maximum number of wildlife sanctuaries (National Park and sanctuaries)?
A. Uttar Pradesh B. Rajasthan
C. Madhya Pradesh D. West Bengal

43. Which soil requires the least tilling?
A. red
B. black
C. laterite
D. alluvial

44. National Environment Engineering Institute is located at:
A. Cuttack B. Jamshedpur
C. Nagpur D. Ranchi

45. Where **'Bheel'** tribe is founded?
A. Asom
B. Jharkhand
C. West Bengal
D. Maharashtra

46. Where is Indian Dynamite Limited located?
A. Kolkata B. Hyderabad
C. Chennai D. Delhi

47. Rainbow revolution is related with:
A. Green - revolution
B. White - revolution
C. Blue - revolution
D. All the above

48. India gets maximum rainfall mainly from:
A. North - East Monsoon
B. Retreating Monsoon
C. South - East Monsoon
D. South-West Monsoon

49. Coastline of which of the following states is known as the Coromondal coast?
A. Karnataka B. Kerala
C. Orissa D. Tamil Nadu

50. The Tropic of Cancer passes through:
A. Andhra Pradesh B. Uttar Pradesh
C. Maharashtra D. Madhya Pradesh

51. Himalayas are:
A. Young fold mountains
B. Residual mountains
C. Volcanic mountains
D. Block mountains

52. Chhota Nagpur plateau is made up to:
A. Old igneous and metamorphic rocks
B. Sedimentary rocks
C. Alluvium
D. Lava flows

53. This region of India is very important from biodiversity point of view:
A. Eastern Himalayas
B. Eastern Ghats
C. Panchmari Hill
D. Kashmir Valley

54. When do the south-west monsoon winds blow in India?
A. January—February
B. March to mid-June
C. Mid-June—September
D. October to December

55. The most ideal region for the cultivation of cotton in India is:
A. The Brahmaputra Valley
B. Indo-Gangetic plain
C. Deccan Trap Region
D. Rann of Kutch

56. In India when population of an urban settlement crosses 100000 it is called:
A. Town B. City
C. Metropolis D. Megalopolis

57. The artificial harbour along the west coast of India is:
A. Cochin B. Kandla
C. Marmagao D. New Mangalore

58. The rocks of the Himalayan System are mainly:
A. sedimentary B. igneous
C. plutonic D. dyke

59. The Stretch of the Himalayas between the Indus and the Sutlej rivers is called:
A. The Asom Himalayas
B. The Punjab Himalayas
C. The Nepal Himalayas
D. The Kumaon Himalayas

60. The flood plain along river banks formed by newer alluvium is called:
A. Bhabar B. Khadar
C. Tarai D. Bangar

61. The 'Kalabaisakhis' originate during:
A. Winter season
B. Rainy season
C. Period of retreating monsoon
D. Summers

62. What type of forest are the 'Sunderbans'?
A. Tidal forests
B. Monsoon forests
C. Tropical evergreen forests
D. Temperate evergreen forests

63. Which river basin has the maximum amount of water available for irrigation?
A. The Ganga B. The Indus
C. The Brahmaputra D. Mahanadi

64. Which state of India is the largest producer of Iron-ore?
A. Karnataka B. Orissa
C. Jharkhand D. Madhya Pradesh

65. Which of the following states is the leading producer of sugarcane in India?
A. Uttar Pradesh B. Madhya Pradesh
C. Punjab D. Bihar

66. Which of the following is a fibre crops?
A. Sugarcane B. Jute
C. Wheat D. Maize

67. Which state is the largest producer of tea in India?
A. Asom B. West Bengal
C. Kerala D. Karnataka

68. In India the local name of shifting cultivation is:
A. Jhum B. Kumari
C. Penda D. All of these

69. What is National water grid plan?
A. To link the Himalayan rivers with peninsular rivers
B. To link east and west flowing rivers of the peninsular
C. To link the rivers of India with the rivers of Pakistan
D. None of the above

70. Which of the following is called the Cotton-polis of India?
A. Kanpur B. Agra
C. Mumbai D. Ahmedabad

71. Ice-age in India was during:
A. Pleistocene
B. Carboniferous
C. Paleozoic age
D. None of the above

72. 'Haimanta system' *i.e.* Cambrian formation is the best seen in:
A. Spiti Valley
B. Kashmir Valley
C. Doon Valley
D. None of the above

73. Gersoppa or Jog fall is on:
A. Mahi river B. Periyar river
C. Brahmini river D. River Sharavati

74. Sivasamudram fall is on:
A. Cauvery river
B. River Sharavati
C. Tista River
D. None of the above

75. Satpura range is between rivers of:
A. Tapi and Penganga
B. Narmada and Tapi
C. Narmada and Luni
D. None of the above

76. River Penganga is the tributary of:
A. Godavari B. Narmada
C. Ganga D. Krishna

77. Narmada river rises in:
A. Vindhya range
B. Kashmir range
C. Maikal range
D. None of the above

78. Tapi river rises in:
A. Maikal range B. Mahadeo range
C. Satpura range D. Ajanta range

79. Guru Shikher is the highest peak of:
A. Vindhya range
B. Aravalli range
C. Kashmir range
D. None of the above

80. Palghat gap is situated between
A. Nilgiri Hills and Cardamom Hills
B. Nilgiri Hills and Shevaroy Hills
C. Shevaroy and Cardamom Hills
D. None of the above

81. River Wardha is tributary of:
A. Narmada B. Luni
C. Godavari D. Krishna

82. The eastern ghats are the example of:
A. folded valley
B. continuous chain of mountains
C. group of isolated hills
D. none of the above

83. Mahendragiri is the highest peak of ?
A. Western Ghat
B. Eastern Ghat
C. Nilgiri hills
D. None of the above

84. The name of Blue mountain is given to:
A. Cardamom hill B. Satpura hill
C. Nilgiri hill D. Palini hill

85. Ootacamund lies at the foots of:
A. Velikonda hills B. Tirupati hills
C. Dodabetta D. Ajanta hills

86. Palkonda and Velikonda hills are the example of:
A. Western range
B. Himalayan range
C. Eastern Ghat
D. Nilgiri hills

87. River Periyar rises near:
A. Elamai B. Anaimudi
C. Davarmalai D. Mahadeo hills

88. The old alluvium of the plain is characteristic by the presence of:
A. Kankar
B. Nitrogenous deposits
C. Rich humus
D. All of the above

89. Mass of alluvium soil covered by the river courses called:
A. Bet lands B. Bluffs
C. Dhaya D. Both B and C

90. An intricate maze of gullies and ravines known as badlands are commonly present in:
A. M.P. B. Bihar
C. U.P. D. Orissa

91. The northern flank of the plateau from Thar Desert to the Rajmahal Hills is characterised by:
A. Remnants of the old mountain ranges
B. Scarped plateaus and faulted trough
C. Both A and B
D. None of the above

92. The Malwa plateau dominated by the Vindhya scarps forms the:
A. Western flank of peninsular India
B. Northern flank of peninsular India
C. Eastern flank of peninsular India
D. None of the above is correct

93. The striking difference between eastern and western coastal plains is:
A. presence of red soil
B. Alluvial margin
C. Both A and B are correct
D. Both A and B are wrong

94. Andaman and Nicobar islands consists of:
A. about 250 islands
B. 225 islands
C. more than 500 islands
D. none of these

95. Nallamalai Hill is present in:
A. Western Ghat
B. Eastern Ghat
C. Tamil Nadu Hills
D. Tirupati Hills

96. Cuddapah ranges is also know as:
A. Northern Hills of Eastern Ghat
B. Middle Hills of Eastern Ghat
C. Tamil Nadu Hills
D. None of these

97. Nilgiri Hills is an example of:
A. Block Mountain
B. Young fold mountain
C. Residual mountain
D. Volcanic mountain

98. Giant gorges are the characteristic feature of:
A. Coastal regions
B. Peninsular rivers
C. Himalayan rivers
D. None of the above

99. Gorges are the feature of:
A. Deposition
B. Erosion
C. Erosional as well as depositional
D. None of the above

100. Antecedent drainage is the characteristic feature of:
A. Indus B. Brahmaputra
C. Godavari D. Both A and B

101. Most of the peninsular rivers flow towards:
A. west
B. east
C. north-west
D. southwardly

102. Narmada and Tapi which are peninsular rivers flow towards:
A. west B. east
C. north-west D. north

103. The river Indus rises in Tibbet near:
A. Manas lake
B. Jhelam lake
C. Mansarover lake
D. None of the above

104. The Indus receives tributaries Gilgit, Shigar etc.
A. Punjab
B. Jammu & Kashmir
C. Himachal Pradesh
D. Pakistan

105. The middle Himalayas has an average elevation of about:
A. 3500 to 5000 mt.
B. 5000 to 7000 mt.
C. Around 8000 mt.
D. none of the above.

106. Mahabharata range is situated in:
A. the Greater Himalaya
B. lesser Himalaya
C. the outer Himalaya
D. none of the above

107. The aver age height of greater Himalaya is:
A. 6000 mt. B. 5000 mt.
C. 4000 mt. D. 3000 mt.

108. Pir Panjal range is an example of:
A. Middle Himalaya
B. Greater Himalaya
C. Siwalik
D. None of the above

109. "Marusthali or Thar" is the region of:
A. Drier parts of the plain of Punjab and Haryana
B. Arid Plains of Rajasthan
C. Both A and B
D. None of the above

110. The fertile plain 'Bari Doab' is present between:
A. River Ravi and Beas
B. Beas & Sutlej
C. River Ravi and Sutlej
D. None of the above

111. The name Sahyadris is given to:
A. Eastern Ghat B. Western Ghat
C. Satpura range D. Vindhya range

112. Peaty soils are mostly found in:
A. Bihar B. Kerala
C. Jharkhand D. Uttar Pradesh

113. The most important soil in the Deccan trap area is the:
A. Red soil B. Black soil
C. Laterite soil D. Alluvial soil

114. Sandy soil of Rajasthan Desert is called:
A. Khadar B. Bhangar
C. Kallar D. Bhur

115. **Assertion (A):** Laterite soils are acidic in property.
Reason (R): Laterite soils are rich inlime.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

116. **Assertion (A):** Laterite soils are generally red in colour.
Reason (R): Laterite soils are rich in oxide of iron.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

117. Which of the following soils is regarded as negative land?
A. Kallar B. Khadar
C. Bhangar D. Regur

118. Which of the following soil type is called Kari in Kerala?
A. Mountain soil B. Alluvial soil
C. Peaty saline soil D. Laterite soil

119. Red soil is commonly found in:
A. Punjab and Haryana
B. Himchal Pradesh and Jammu and Kashmir
C. Rajasthan and Gujarat
D. Tamil Nadu and Andhra Pradesh

120. Which of the following is incorrect?
A. Red soils are rich in iron
B. Black soils are rich in phosphorus, nitrogen and organic matter
C. Alluvial soils are rich in potash but poor in phosphorus
D. Red soils are rich suitable for cultivation of pulses and coarse grains

121. .....soil is found in the region of heavy rainfall.
A. Laterite B. Red
C. Black D. Alluvial

122. Which of the following states has very little alluvial soil?
A. Bihar B. Jharkhand
C. Madhya Pradesh D. Tamil Nadu

123. The Indo-Gangetic Plains are made up of mostly
A. Alluvial soil
B. Mountain soil
C. Black soil
D. Alpine medow soil

124. Which of the following soils is the most fertile?
A. Laterite soil B. Red soil
C. Alluvial soil D. Yellow soil

125. Which soil is rich in iron and aluminium compound?
A. Laterite soil B. Black soil
C. Yellow soil D. Alluvial soil

126. Which of the following soil is found in Maharashtra?
A. Black soil B. Alluvial soil
C. Red soil D. Yellow soil

127. Which of the following Indian states does not possess acidic soils?
A. Asom B. Tripura
C. Manipur D. Rajasthan

128. **Assertion (A):** The soils of the north Indian Plains are typically alluvial.
Reason (R): The alluvial soils of the north Indian Plains have been deposited by the rivers.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

129. Which of the following minerals is not found in Black Soils?
A. Iron B. Phosphorous
C. Magnesium D. Aluminium

130. **Assertion (A):** Alluvial soils are regarded the richest soil.
Reason (R): The mineral composition in alluvial soils are well broken-up which can be easily absorbed by the root of plants.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

131. Which of the phenomenon can be described as the creeping death of the soil?
A. Soil conservation
B. Soil formation
C. Soil erosion
D. Nitrogen fixation

132. **Assertion (A):** The farmers of the drier parts of Haryana, Rajasthan and Gujarat plant rows of trees around their fields.
Reason (R): Plantation of trees reduces the velocity of winds and prevents the soil erosion.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

133. **Assertion (A):** Contour bunding of the fields is done in areas of steep slopes.
Reason (R): The fields in areas of steep slopes face the problems of surface run off.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

134. **Assertion (A):** Alpine meadow soil contains mostly undecomposed plants.
Reason (R): Alpine meadow soil is found in very cold areas.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

135. **Assertion (A):** Brown forest soil is rich in humus and slightly acidic in reaction.
Reason (R): Brown soil is found in marshy areas of the coastal plain.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

136. The soils in the flood plains of the rivers formed by recent alluvium are called:
A. Bhangar B. Khadar
C. Reh D. Bhur

137. The soils of the.....have been formed in situ.
A. Valley of Narmada
B. Sutlej-Ganga Plain
C. Valley of Tapi
D. Indian Plateau

138. Which of the following places receives minimum annual rainfall?
A. Mangalore B. Bikaner
C. Allahabad D. Nagpur

139. **Assertion (A):** The southern half of India has a tropical climate.
Reason (R): The tropic of cancer does not pass through the middle of India.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

140. **Assertion (A):** When the Kashmiri peasant Shivers with biting cold inside his pheren, the peasants of the Kerala coast work in their paddy fields in a loin cloth.
Reason (R): The regional variations in the climatic characteristics strikingly differentiate the climate of different regions of India.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

141. Which of the following places in India ranks second among the coldest inhabited places in the world?
A. Drass (Jammu and Kashmir)
B. Itanagar (Arunachal Pradesh)
C. Manali (Himachal Pradesh)
D. Kullu (Himachal Pradesh)

142. **Assertion (A):** The central Asom valley lies in rain shadow area.
Reason (R): The central Asom valley receives less rainfall (163.7 c.m. annual) in comparison to Cherapunji (1141.9 cm.)
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

143. **Assertion (A):** Gujarat and the neighbouring parts of Rajasthan receive scantly rainfall.
Reason (R): The mountain ranges of Gujarat and Rajasthan do not confront the moisture-laden winds coming from the Arabian Sea.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

144. **Assertion (A):** Southern Tamil Nadu receives maximum rainfall during the months from June to September.
Reason (R): The southern Tamil Nadu is situated on the leeward of Cardamom hill.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

145. The amount and intensity of monsoon rainfall is determined by the frequency of:
A. Tropical depression
B. Cyclones
C. Dust-storms
D. Western disturbances

146. Which of the following clouds is a middle level cloud?
A. Altocumulus B. Nimbostratus
C. Cirrostrates D. Cirrus

147. South-west monsoon brings rain in India in the month of:
A. January B. February
C. June D. December

148. When south-west monsoon retreats in December, it is called
A. north-east monsoon
B. east-west monsoon
C. north-west monsoon
D. south-east monsoon

149. One of the regions that receives from the north-easterly monsoon is:
A. Tamil Nadu B. Kerala
C. Asom D. West Bengal

150. One of the regions that receives rainfall from the north easterly monsoon is:
A. Tamil Nadu B. Kerala
C. Asom D. West Bengal

151. Which of the following states receives the heaviest rainfall?
A. Meghalaya B. Manipur
C. Bihar D. Kerala

152. Which hill tract in India receives the maximum rainfall?
A. Nilgiris B. Aravalli
C. Khasi hills D. Eastern ghats

153. A rainy month is one which receives more than.....of the mean annual rainfall.
A. 1/12 B. $\frac{1}{15}$
C. 1/10 D. 1/5

154. The western disturbances originate over:
A. Bay of Bengal
B. Arabian Sea
C. Mediterranean Sea
D. Indian Ocean

155. In Kerala and parts of western coastal land the pre-monsoon showers are known as:
A. western disturbances
B. Mango shower
C. Nor westers
D. Kalbaisakhi

156. Which of the following is incorrectly matched?
A. Mango shower — Kerala
B. Kalbaisakhi — Asom and West Bengal
C. Norwester— Maharashtra
D. Loo — Haryana and Uttar Pradesh

157. The south-west monsoon causes rainfall over most of the country except.
A. Tamil Nadu B. Punjab
C. Rajasthan D. Gujarat

158. Which of the following region/area is not affected by the monsoon of the Arabian Sea branch?
A. The Western Ghat
B. The Punjab Plain
C. The Deccan Plateau
D. Madhya Pradesh

159. The easterly depressions develop over:
A. Bay of Bengal
B. Bay of Arab Sea
C. Gulf of Cambay
D. Rann of Kutchh

160. **Assertion (A):** Rajasthan remains very warm during the day and cold in the night.
Reason (R): Temperature of sandy area does not fluctuate.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

161. Which of the following is the hottest month in south India?
A. June B. September
C. May D. March

162. Which of the following places in Rajasthan is likely to have the highest temperature on a day in June?
A. Barmer B. Jaipur
C. Udaipur D. Bhilwada

163. **Assertion (A):** Bengluru receives lesser rainfall than Mangalore even though both are located more or less on the same plain.
Reason (R): Bengluru is situated in the rain shadow area
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

164. If a strong anticyclone develops on the southern area of the Arabian sea. It will:
A. hamper the monsoon
B. mean premature coming of monsoon
C. delay the monsoon
D. have no effect on monsoon

165. Which of the following cities in India has a modest temperature through out the year?
A. Patna B. Dehradun
C. Bengluru D. Allahabad

166. Which of the following cities has the sun overhead at least once a year?
A. Hyderabad B. Mangalore
C. Trivendrum D. Ujjain

167. Which of the following places will have maximum sunlight during the December?
A. Shilong B. Kanyakumari
C. Ranchi D. Jodhpur

168. Which of the following Indian states receives the sun-rays first in the morning?
A. Arunachal Pradesh
B. Sikkim
C. Tripura
D. Meghalaya

169. **Assertion (A):** Shimla is cooler than Amritsar though both are on the same latitude.
Reason (R): Temperature decreases at higher altitude.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

170. Match List I with List II and select the correct answer using the code given below the lists—

List I (Indian seasons)	***List II Month (Engish Calendar)***
(a) Vasanta	1. November-December
(b) Hemanta	2. May-June
(c) Grishma	3. September-October
(d) Sharada	4. March-April

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	2	3	4	1
B.	3	4	1	2
C.	4	1	2	3
D.	1	2	3	4

171. Which of the following months of English calendar correspond to the Indian season Shishira?
A. March-April
B. May-June
C. July-August
D. January-February

172. As Chaitra-Baisakha is to March-April, Magha Phalguana to:
A. January-February
B. September-October
C. July-August
D. March-April

173. Which of the following is the first season according to Indian convention?
A. Vasanta B. Sharada
C. Grishma D. Hemanta

174. Match List I with List II and select the correct answer using the code given below the lists:

List I (Indian Calendar)	***List II Month (Engish Calendar)***
(a) Aswina-Kartika	1. July-August
(b) Jyeshtha-Assdha	2. November-December
(c) Sravana-Bhadra	3. May-June
(d) Margashirsa-pausa	4. September-October

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	3	4	2	1
B.	2	1	3	4
C.	4	3	1	2
D.	1	2	4	3

175. **Assertion (A):** The north west India remains exceptionally dry in April and May.
Reason (R): Very few western depressions pass through the north-west India during April-May.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

176. Punjab in winter gets rain because of:
A. north-west trade winds
B. south-west monsoon

C. cyclones coming from Mediterranean Sea and Gulf of Iran
D. Retreating monsoons

177. According to Indian convention, the year is divided into:
A. six seasons
B. eight seasons
C. four seasons
D. None of these

178. India extends between:
A. 8°4'N to 37°6'N and 68°7' E to 97° 25'E
B. 7°2'N to 36°5'N and 67°6' E to 96° 25'E
C. 6°1'N to 35°4'N and 66°5' E to 95° 25'E
D. None of these.

179. India covers an area of:
A. 32,87, 263 sq km.
B. 32,86, 253 sq km.
C. 32,85, 242 sq km.
D. 35,87, 243 sq km.

180. The area of India is 2.2% of the total world area but has:
A. 16% of the entire human race
B. 17% of the entire human race
C. 15% of the entire human race
D. 14% of the entire human race

181. India measures.....km. North to south.
A. 2,9,33 km. B. 3,2,14 km.
C. 3,244 km. D. 2,9,34 km.

182. India measures.....km. east to west.
A. 2,9,33 km. B. 3,2,14 km.
C. 2,9,22 km. D. 2 7-11 km.

183. The coastline of India is about:
A. 8100 km. B. 7100 km.
C. 6100 km. D. 5100 km.

184. The valley of Leh, Gilgit are the:
A. eastern outpost of India
B. Northern most out post of India
C. North eastern outpost of India
D. North western outpost of India

185. Kirthar hill separates India from:
A. Pakistan B. Afghanistan
C. China D. Sri Lanka

186. The Jelepa La pass is situated in:
A. western frontier
B. north-western frontier
C. eastern-frontier
D. north-eastern frontier

187. The Patkai hill separates India from:
A. Myanmar B. China
C. Pakistan D. Sri Lanka

188. India has.....major ports along entire Peninsular coastline.
A. 15 B. 16
C. 14 D. 11

189. Peninsular India is dominated by:
A. highly differentiated relief
B. Senile topography
C. young mountain system
D. none of the above

190. The snowline in the Himalaya varies between:
A. 4500 to 6000 mt in thewest
B. 4500 to 6000 mt in the east
C. 4000 to 5800 mt in the west
D. 4000 to 5700 mt in the east

191. The term rhododendrons is applied to:
A. particular animals found in Himalaya
B. deciduous trees
C. trees
D. A and B are correct

192. Dhauladhar range is situated in:
A. lesser Himalaya
B. Greater Himalaya
C. Outer Himalaya
D. Trans Himalaya

193. The largest glacier is:
A. Baltoro B. Hispar
C. Batura D. Bipo

194. Mizo hills are:
A. northern part of the northern east ranges
B. southern part of the north east ranges
C. part of north-western ranges
D. None of the above

195. The Himalayan region comes in:
A. frequent earthquake zone
B. earthquake free zone
C. comparatively less than eastern ghat
D. none of the above

196. Between the Himalaya in the north and the stable table land of the peninsula lies:
A. Indo-Gangetic Plain having Semi-arid plain as well as delta
B. Vast Indo-Gangatic plain only
C. only the Desert
D. Both A and B

197. The name "dust of mountains" is given to:
A. Coastal areas (western)
B. Deccan regions
C. Alluvial Plain
D. None of the above

198. The great alluvial plain of India contains about:
A. 1/3rd of total land as well as sea area
B. 2/3rd of the total land area
C. 1/3rd of the total land area
D. 2/3rd of the total land as well as sea area

199. The oldest and one of the stable land masses of the world is:
A. Peninsular India
B. Vast plain
C. Himalayan region
D. Greenland

200. Bundelkhand upland comes in:
A. the southern highlands
B. the northern highlands
C. the central highlands
D. the western highlands

201. Ajanta and Ellora hills lie in
A. North of Narmada
B. North of Tapi
C. South of Godavari
D. South of Tapi

202. Which order of the three parallel ranges is correct, according to arrangement?
A. The Himachal, the Siwaliks and the Himadri
B. The Siwaliks, the Himachal and the Himadri
C. The Himadri, the Siwalik and Himachal
D. The Siwaliks, the Himadri and Himachal

203. The Siwaliks were formed during the:
A. the mid miocene to lower pleistocene
B. miocene time
C. the cenozoic times
D. the pleistocene

204. The Siwaliks are called.....in Arunachal Pradesh.
A. Dhang B. Miri
C. Dundwa D. Churiacohati

205. The Shimla Hill Station is situated on:
A. the Shimla range
B. the Pir Panjal range
C. the Dhauladhar range
D. none of these

206. The river Narayani is the important tributary of the river.
A. Gandak B. Ganga
C. Ghaghra D. Yamuna

207. The river Brahmaputra or Tsangpo originates from:
A. Kullu hills of Himachal Pradesh
B. Manali hills of Himachal Pradesh
C. Mansarovar Lake
D. Chemayungdung glacier

208. The river Baitarni drains into
A. Arabian Sea. B. Indian Ocean.
C. Bay of Bengal. D. Rann of Kachh.

209. East to west India covers almost the some distance as it does north to south, which is approximately.
A. 6000 km. B. 5000 km.
C. 4000 km. D. 3000 km.

210. Rechna doab is lying between the rivers:
A. The Chenab and the Jhelum
B. The Beas and the Ravi
C. The Ravi and the Chenab
D. The Sutlej and the Ravi

211. Sind Sagar doab is lying between the rivers.

A. The Jhelum-Chenab and the Indus
B. The Jhelum and Indus
C. The Beas and the Ravi
D. The Sutlej and the Beas

212. All along the foot of the Siwaliks lies:
A. Khadar
B. Bhabar
C. Bhangar
D. None of the above

213. The pebble beds of Bhabar region are usually:
A. parallel to the slope of the river-bed
B. transverse to the slope of the river-beds
C. all of these
D. none of these

214. Along the dry course of Alluvial Plain these occurred numerous Alkaline Lakes locally known as:
A. Dhoros B. Bhangar
C. Khadar D. Dhang

215. The Khadar belt of Punjab plain is locally known as:
A. Bad Lands B. Good Land
C. Bet Lands D. Dhoros

216. The peninsular river.....forms wide, fan shaped, conspicuous delta, along eastern coast.
A. Godavari B. Narmada
C. Tapi D. None of these.

217. The river Tista is tributary of:
A. the Brahmaputra
B. Yamuna
C. Ganga
D. Indus

218. The waterfall Kapildhara is on the river:
A. Narmada B. Tapi
C. Godavari D. Krishna

219. The term "monsoon" is applied to a wind regime
A. Above a level of 20 mt.
B. Above a level of 20 km.
C. Above a level of 30 km.
D. Above a level of 30 mt.

220. At the level of above 20 km winds are:
A. Westerly in winter
B. Easterly in summer
C. Both A and B
D. None of these

221. Indian monsoon is marked by seasonal shift caused by:
A. great uniformity of temperature
B. cold winds of central Asia
C. deferential heating of the land and sea
D. none of these

222. India have regular reversal of wind system at the time of:
A. the equinox
B. the summer solstice
C. the winter solstice
D. None of these

223. The wind system is largely confined to the tropics *i.e.* between:
A. 30°N and 20°S.
B. 20°N and 30°S.
C. 20°N and 20°S.
D. 30°N and 30°S.

224. The line of demarcation between the trade winds of the northern and the southern hemisphere is often known as:
A. Inter temperate front
B. Inter tropical front
C. Cold front
D. None of these

225. The example of sedentry soil is:
A. the black cotton soils
B. alluvial soils
C. the peaty soil
D. Both A and C

226. Azonal soils are also known as:
A. transported soil B. drift soils
C. alluvial soils D. All of the above

227. The Indian Council of Agriculture research divided Indian soils in:
A. 8 different categories
B. 9 different categories
C. 7 different categories
D. 11 different categories

228. The depth of Alluvial soil generally exceeds about below the ground surface.
A. 800 mts. B. 800 ft.
C. 600 mts. D. 600 ft.

229. The older alluviation known as Bhanger is found.....above the flood level:
A. about 30 ft. B. 60 mts.
C. 60 ft. D. 30 ft.

230. Peat and marshy soils originate in the:
A. below 400 mts. from the sea level
B. above 400 mts. from the sea level
C. humid regions
D. dry regions

231. Saline and Alkaline soils specially occur in:
A. Rajasthan B. Uttar Pradesh
C. Kerala D. Both A and B

232. The name Reh is given to:
A. Alkaline and Saline soil
B. Alluvial soil
C. Black soil
D. Red soil

233. Chemically the Black Soils are deficient in:
A. organic matter B. iron
C. potash D. none of these

234. Black Soils are mainly concentrated in:
A. Maharashtra B. Gujarat
C. Kerala D. Both A and B

235. The process of pedogenesis includes:
A. classification of soils
B. formation of soils
C. hydrological cycle
D. none of these

236. The pattern of soil is determined by:
A. climate
B. altitutde
C. Both climate and altitude
D. none of these

237. Soils and natural vegetations are:
A. mutually interdependent
B. independent to each other
C. inter dependent and modify the other against the ecosystem
D. none of these

238. Soils found on the north Indian Plain is:
A. transported and deposited by the rivers
B. closely related to the parent rocks
C. formed by the weathering of the rocks insites
D. none of these

239. Koeppen's system of classification is based on:
A. on monthly values of term and precipitation
B. precipitation
C. temperature
D. none of these

240. Koeppen identified.....major climatic region.
A. Seven B. Six
C. Five D. Four

241. Thornth waite's system, of climate classification is based on:
A. on the concept of water balance
B. only precepitation
C. on monthly values of temperature
D. none of these

242. The distribution of annual rainfall Bengal and Orissa coasts steadily, declines towards:
A. the north-west
B. the west
C. the north-east
D. Both A and B

243. In the dry regions of west Rajasthan the rainfall is below:
A. 40 cm. B. 30 cm.
C. 20 cm. D. 10 cm.

244. The highest rainfall exceeds.....in a year in the hills of Meghalaya.
A. 300 cm. B. 200 cm.
C. 100 cm. D. 50 cm.

245. The Ganga has its minimum flow in the period:
A. January to June
B. June to October
C. December to March
D. None of these

246. The peninsular rivers are.....in nature.
A. Monsoonal
B. Perennial
C. Non-perennial
D. to depend on both snow melt and rainfall for water supply

247. The river Girna joins the river:
A. Krishna B. Godavari
C. Tapi D. Narmada

248. The north-west flank of plateau is drained by:
A. Sabarmati B. Tapi
C. Narmada D. Krishna

249. Which of the following river is land locked?
A. Narmada B. Sabarmati
C. Luni D. Tapi

250. The port Tuticorin is located near:
A. Gulf of manner
B. Gulf of Khambat
C. Gulf of Kachch
D. None of these

251. The name Jammu Hills in Jammu is given to:
A. the Himachal B. the Himadri
C. the Sahyadri D. the Siwaliks

252. Most of the Himalayan rivers have their sources in:
A. the Aravali
B. the Siwaliks
C. the Himachal and the Himadri
D. Both A and B

253. The important hill station Ranikhet is situated in the:
A. Himachal ranges B. Himadri
C. Siwalik D. All of the above

254. The average height of the Pir Panjal range is:
A. 4000 mt. B. 5000 mt.
C. 6000 mt. D. 7000 mt.

255. The metamorphosed sediments with grantic core is the common feature of
A. the Siwaliks
B. the great Himalayas
C. the Himachal ranges
D. none of these

256. The Namcha Barwa is located near:
A. Namcha Barwa
B. North of Arunachal Pradesh
C. Nanga Parbat
D. Both A and B

257. The Ladakh plateau occupies the.....portion of Kashmir.
A. North-eastern B. North-western
C. South D. North-south

258. The Shipki La pass is in:
A. Bihar
B. Jammu & Kashmir
C. Himachal Pradesh
D. Uttar Pradesh

259. The Nathu La is an important pass in:
A. Sikkim
B. Himachal Pradesh
C. Uttarakhand
D. Uttar Pradesh

260. Garlang, Zaskar and Dras and shigar are tributaries of:
A. Ganga B. Brahmaputra
C. Yamuna D. Indus

261. Beyond Farakka, the main stream of the Ganga flows into Bangladesh by the name:
A. Bhagirathi B. Punpun
C. Padma D. Son

262. Which of the following is the largest river of Peninsular India?
A. Krishna. B. Cauveri.
C. Mahanadi. D. Godavari.

263. Match List I with List II and select the correct answer using the code given below the lists:

List I ***(Rivers)***	***List II*** ***(Tributaries)***
(a) Indus	1. Mahanadi
(b) Ganga	2. Bhima
(c) Krishna	3. Wainganga
(d) Godavari	4. Nubra

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	2	3	4	1
B.	3	4	1	2
C.	4	1	2	3
D.	1	2	3	4

264. Which of the following states does not share the Godavari?
A. Gujarat
B. Karnataka
C. Madhya Pradesh
D. Andhra Pradesh

265. **Assertion (A):** Godavari is often referred to as Vridha Ganga.
Reason (R): Godvari is larger than Ganga in size.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

266. Which of the following rivers empties itself into the Arabian Sea?
A. Cauvery B. Krishna
C. Narmada D. Mahanadi

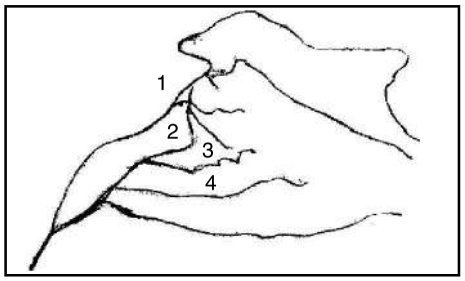
267. Match List I with List II and select the correct answer using the code given below the lists:

List I (Rivers)	***List II (Place of Origin)***
(a) Chambal	1. Mhow (Vindhya range)
(b) Son	2. Amarkantak
(c) Indus	3. Verinag
(d) Jhelum	4. Kailash range

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	4	1	3	2
B.	3	4	1	2
C.	2	3	1	4
D.	1	2	4	3

268. Which of the following options correctly indentifies the rivers numbered 1, 2, 3 and 4 in the map given below?



A. 1. Jhelum 2. Ravi 3. Sutlej. 4. Indus
B. 1. Ravi 2. Jhelum 3. Indus 4. Chenab
C. 1. Sutlej 2. Luni 3. Ravi 4. Beas
D. 1. Indus 2. Jhelum 3. Chenab 4. Ravi

269. Under the regulations of the Indus water treaty signed with Pakistan, India can utilize.....percent of the Indus water.
A. 45 B. 40
C. 42 D. 20

270. The headstreams of Ganga, Bhagirathi and Alaknanda, unite at
A. Haridwar. B. Rudraprayag.
C. Badrinath. D. Dev Prayag.

271. **Assertion (A):** Deccan rivers fluctuate in volume.
Reason (R): Deccan rivers are rain-fed.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

272. Brahmaputra in Bangladesh is known by the name:
A. Brahmini
B. Yamuna and Meghna
C. Padma
D. Hugli

273. Which of the following rivers has its source near Ajmer in the Aravalli range?
A. Tapi B. Sabarmati
C. Suvarnrekha D. Luni

274. **Assertion (A):** The deltas are not found at the mouth of Narmada.
Reason (R): Narmada does not contain large quantities of alluvial matter and its mouth faces strong tides and currents.

A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

275. **Assertion (A):** The Volume of water in the Ganga increases towards the east.
Reason (R): Rainfall in India increases towards the east
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

276. Which among the following rivers is a tidal river?
A. Tapi B. Narmada
C. Ganga D. Hooghly

277. The length of Yamuna from its source to the point of its merger into Ganga. (Allahabad) is about:
A. 2000 km. B. 1500 km.
C. 1375 km. D. 1175 km.

278. Which of the following rivers is known by the names the Kali and the Chauka at different places?
A. Brahmini B. Luni
C. Sarda D. Kosi

279. Which of the following rivers has not been declared as national waterway?
A. Sutlej B. Brahmaputra
C. Godavari D. Krishna

280. Which of the following rivers makes an estuary?
A. Bhagirathi Hooghly
B. Mahanadi
C. Godavari
D. Krishna

281. The Brahmaputra in Tibet is known as:
A. Dhansiri. B. Padma.
C. Dibang. D. Tsangpo.

282. **Assertion (A):** The Brahmaputra carries an immense quantity of water.
Reason (R): The tributaries of the Brahmaputra are large and they pour enormous quantities of water.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

283. Match List I with List II and select the correct answer using the code given below the lists:

List I (Springs)	***List II (Places)***
(a) Mani Karan	1. Kulu
(b) Tatapani	2. Shimla
(c) Jawalamukhi	3. Kangra
(d) Rajgir	4. Nalanda

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	1	2	3	4
B.	4	3	2	1
C.	3	2	4	1
D.	1	3	2	4

284. Tochi, Gilgit and Hunza are tributaries of:
A. Ganga B. Indus
C. Brahmaputra D. Yamuna

285. Adyar estuary is located in:
A. Orissa B. Tamil Nadu
C. West Bengal D. Andhra Pradesh

286. Match List I with List II and select the correct answer using the code given below the lists:

List I (Wetlands)	***List II (States)***
(a) Kolleru	1. Rajasthan
(b) Pichola	2. Punjab
(c) Ashtamudi	3. Andhra Pradesh
(d) Harike	4. Kerala

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	3	1	4	2
B.	1	2	4	3
C.	3	2	1	4
D.	4	3	2	1

287. Match List I with List II and select the correct answer using the code given below the lists:

List I (Wetlands)	***List II (States)***
(a) Ujni	1. Punjab
(b) Renuka	2. Himachal Pradesh
(c) Loktak	3. Manipur
(d) Kangli	4. Maharashtra

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	4	2	3	1
B.	1	2	3	4
C.	2	3	4	1
D.	3	2	1	4

288. Which of the following is incorrectly matched?
A. Kabar Lake — Bihar
B. Nalsarovar Lake — Gujarat
C. Wullar Lake — Jammu and Kashmir
D. Chilka — Andhra Pradesh

289. Which of the following Lakes is a Plaga Lake?
A. Nainital Lake B. Sambhar Lake
C. Renuka Lake D. Chilka Lake

290. Which of the following Lakes is formed by the Volcanic activity?
A. Bhimtal Lake
B. Gobi and Sagar
C. Kabar Lake
D. Neelsarovar Lake

291. Which of the following Lakes is an ox bow Lake?
A. Pulicat (Tamil Nadu)
B. Chilka (Orissa)
C. Wullar (Jammu and Kashmir)
D. Sambhar (Rajasthan)

292. Which of the following Seas in Indian Ocean is the largest one?
A. Bay of Bengal
B. Persian Gulf
C. Gulf of Cambay
D. Gulf of Aden.

293. **Assertion (A):** The Kosi is also known as Bihar's sorrow.
Reason (R): The kosi shifts its course deposits silt and causes floods.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

294. **Assertion (A):** The concept of natural resource is said to be culture bound.
Reason (R): There is a close relationship between the resource and the level of technological (cultural) development.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

295. Match List I with List II and select the correct answer using the code given below the lists:

List I (Coalfied)	***List II (State)***
(a) Karanpura	1. Uttar Pradesh
(b) Sohagpur	2. Andhra Pradesh
(c) Tandur	3. Jharkhand
(d) Singrauli	4. Madhya Pradesh

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	3	4	2	1
B.	4	3	1	2
C.	1	2	4	3
D.	2	1	3	4

296. The largest reserve of coal in India occurs in:
A. Damodar Basin. B. Godavari Basin.
C. Narmada Basin. D. Cauvery Basin.

297. Ankeleshwar, Nawagam, Kalal, sobhasan and sand oil-fields are situated in:
A. Asom. B. Mumbai
C. Gujarat. D. Andhra Pradesh.

298. Gulf of combay is associated with:
A. oil and natural gas
B. coal
C. hydro electricity
D. nuclear minerals

299. Matatilla multipurpose project (Uttar Pradesh and Madhya Pradesh) is located on river.
A. Ganga B. Betwa
C. Mahanadi D. Damodar

300. Which among the following projects is administered by more than one state?
A. Hirakund B. Tungabhadra
C. Bhakra Nangal D. Kosi

301. Which of the following dams/projects is not situated in Gujarat?
A. Kakrapar B. Ukai
C. Mahi D. Tawa

302. Which of the following is true of Farakka project?
1. It is aimed at saving the Hooghly from salinity and silting
2. It was constructed to improve the Navigation in Hooghly.
3. It is a barrage across the Ganga.

Codes:
A. 1 and 2 only
B. 1 and 3 only
C. 2 and 3 only
D. All of the above

303. **Assertion (A):** Most of the nuclear power stations in India have been constructed near sources of water.
Reason (R): Nuclear power stations require great quantity of water for cooling purpose.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

304. Monazite, Ilmenite, Ruttile and Sillimanite are the minerals found in beach sands of Kerala. Among these minerals.....is the source of uranium and thorium.
A. Monazite B. Ilmenite
C. Ruttite D. Sillimanite

305. Sanjay Vidyut project, Asia's first fully underground Hydel-project is located in :
A. Uttar Pradesh
B. Himachal Pradesh
C. Gujarat
D. West Bengal

306. Which of the following pairs of hydro-electricity projects and their locations is incorrectly matched?
A. Uri Dulhasti —Jammu and Kashmir
B. Shamera —Himachal Pradesh
C. Tanakpur —Rajasthan
D. Loktak —Manipur

307. Which of the following districts in India leads in the production of Havemetite iron-ore?
A. Chickmagalur B. Singhbhum
C. Keonjhar D. Sundergarh

308. Noamundi and Manoharpur iron mining centres are located in:
A. Madhya Pradesh
B. Orissa
C. Jharkhand
D. Bihar

309. Badampahar and Sulaipat iron mining centres are situated in:
A. Andhra Pradesh B. Karnataka
C. Orissa D. Tamil Nadu

310. Bhilai Steel Works receive iron ore from:
A. Dhauli and Rajhara hills
B. Babubudan hills and Sulaipat
C. Badampahar and Monoharpur
D. Gua and Noamundi

311. 55% iron-ore in India is produced by:
A. Bihar and Orissa
B. Karnataka and Orissa
C. Bihar and M.P.
D. Karnataka and Andhra Pradesh

312. India has an estimated reserve of 28500 million tonnes of iron-ore which accounts for about.....of the total reserves of the world.
A. 50% B. 60%
C. 40% D. 20%

313. Balaghat—Bhandara—Nagpur belt is famous for
A. Manganese ore B. Iron ore
C. Mica ore D. Bauxite

314. India has monopoly in the production of..... in the world.
A. Manganese B. Thorium
C. Uranium D. Iron

315. **Assertion (A):** Mica is indispensable for the manufacture of elctrical equipments.
Reason (R): Mica is a good conductor of electricity.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

316. Kodarma, Giridih and DommChanch (Jharkhand) are the chief collecting centres of:
A. Coal B. Manganese
C. Iron D. Mica

317. Which of the following bauxite deposits in considered as the largest one in India?
A. Riasi and Poonch deposit (Jammu & Kashmir)
B. Panchpat mali deposit (Odisha)
C. Gandhamardan deposit (Odisha)
D. Balaghat deposits (Madhya Pradesh)

318. **Assertion (A):** The aluminium (desired from bauxite) is used in the manufacture of aeroplanes and automobile engines.
Reason (R): The aluminium is a light and tough metal.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

319. Match List I with List II and select the correct answer using the code given below the lists:

List I (Copper)	***List II (States)***
(a) Rangpo	1. Jharkhand
(b) Kalyadi	2. Karnataka
(c) Mosabani	3. Sikkim
(d) Jhanewasna	4. Maharashtra

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	1	4	3	2
B.	4	3	2	1
C.	3	2	1	4
D.	2	1	4	3

320. Muscovite phlogopite and biotite are the three major forms of:
A. Bauxite B. Gypsum
C. Mangnese D. Mica

321. Ramgiri and Yeppamanna goldfields are located at:
A. Anantpur (Andhra Pradesh)
B. Jaisalmer (Rajasthan)
C. Raichur (Karnataka)
D. Bastar (Madhya Pradesh)

322. Hutti in Raichur district of Karnataka is famous for:
A. Copper-fields
B. Coal-fields
C. Iron ore deposits
D. Gold fields

323. Which of the following states in India leads in the production of lead and zink?
A. Rajasthan B. Jharkhand
C. Uttar Pradesh D. Bihar

324. Zawar mines (Udaipur) are famous for:
A. lead and zinc
B. sulphur and zypsum
C. iron and copper
D. mica and bauxite

325. Diamonds mines in India are located in:
A. Rajasthan
B. Madhya Pradesh
C. Bihar
D. Tamil Nadu

326. Which one of the following is the wrong pair?
A. Sulphur — Rohtas
B. Gypsum — Jamsar
C. Phosphate — Thar Desert
D. Potash — Kerala Coast

327. Thorium is recovered most economically from monazite which occurs extensively in the sands.

A. Tamil Nadu B. Kerala
C. Goa D. Andhra Pradesh

328. Which of the following is wrongly matched?
A. Shompens — Andaman & Nicobar
B. Minicoy — Lakshadweep
C. Khasi — Mizoram
D. Garo — Madhya Pradesh

329. Which of the following cities is a well known centre for tanning process known as E.L. (East India) tanning?
A. Agra B. Kanpur
C. Surat D. Madras

330. Which of the following states leads in production of chrome-tanned hides?
A. Tamil Nadu B. Uttar Pradesh
C. West Bengal D. Maharashtra

331. Jharia, Kudremukh, Khetri and Kolar are associated with:
A. Iron, Coal, Copper and Gold
B. Coal, Iron, Copper and Gold
C. Copper, Iron, Coal and Gold
D. Coal, Copper, Iron and Gold

332. As glass bangles is to Firozabad, so is enamelling (Minakari) of jwellery to:
A. Patna B. Bhubaneshwar
C. Jaipur D. Shimla

333. The first paper mill in India was established in 1832 at:
A. Kalyan
B. Serampur (West Bengal)
C. Sehore
D. Belagola

334. Apart from Bamboo, Sabai and Salai grasses make the main raw materials for paper industry. These grasses are mainly grown in:
A. Madhya Pradesh
B. Bihar
C. Rajasthan
D. Gujarat

335. **Assertion (A):** More land should be brought under plantation of eucalyptus and other trees for making paper.
Reason (R): The paper industry is essentially plantation based.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

336. Match List I with List II and select the correct answer using the code given below the lists:

List I (Paper Mills)	***List II (State)***
(a) Baranagore	1. Andhra Pradesh
(b) Sirpur	2. Maharashtra
(c) Vikhroli	3. Madhya Pradesh
(d) Shahdol	4. West Bengal

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	2	3	4	1
B.	3	4	1	2
C.	4	1	2	3
D.	1	2	3	4

337. The best grades of papers such as bond ledger, and book are made from:
A. Wood pulp. B. Soda pulp.
C. Kraft pulp. D. Sulphite pulp.

338. The major part (85%) of the news print paper consists of:
A. Wood pulp B. Soda pulp
C. Alfa cellulose D. Sulphite pulp

339. Match List I with List II and select the correct answer using the code given below the lists:

List I (Kinds of Paper)	***List II (Materials)***
(a) Wrapping paper	1. Soda pulp
(b) Blotting paper	2. Kraft pulp
(c) Facial tissue	3. Flax
(d) Cigarette paper	4. Sulphite pulp

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	4	3	2	1
B.	3	2	1	4
C.	1	4	3	2
D.	2	1	4	3

340. The first rubber factory in India started in 1955 at:
A. Barauni (Bihar)
B. Behrampur (Orissa)
C. Sonapur (Asom)
D. Bareilley (Uttar Pradesh)

341. At present, Kerala is the most important rubber producing state in India with plantations concentrated particularly in..... and.....districts.
A. Kottayam, Quilon
B. Trichur, Palghat
C. Palghat, Quilon
D. Trichur, Kannur

342. Which of the following is the first iron and steel industry in India set up in 1870 at Kulti?
A. Bengal Iron Works
B. Tata Iron and Steel Company
C. Indian Iron and Steel Company
D. Mysore Steel Works

343. Which is the largest steel plant of India?
A. Vishakhapatnam Steel Plant
B. Diatri Steel Plant
C. Indian Iron and Steel Company
D. Bokaro Steel Plant

344. Visvesvaraya Iron and Steel Works was formerly known as:
A. Mysore Steel Works
B. Bengal Iron Works
C. Tata Iron and Steel Works
D. Indian Iron and Steel Works

345. Which of the following rivers provides water to Tata Iron and Steel Plant Jamshedpur?
A. Mahanadi B. Gandak
C. Subarnrekha D. Brahmaputra

346. The three iron and steel plants at Kulti, Burnpur and Hirapur have been merged together as:
A. Tata Iron and Steel Company
B. Indian Iron and Steel Company
C. Bengal Iron Works
D. Mysore Iron Works

347. Which of the following iron and steel plant is not a public sector enterprise?
A. Jamshedpur B. Bhilai
C. Rourkela D. Durgapur

348. Match List I with List II and select the correct answer using the code given below the lists:

List I (Steel Plant)	***List II (Source of Power)***
(a) Visvesvaraya	1. Korba Power Station
(b) Bhilai	2. Hirakud Project
(c) Rourkela	3. Sharavati Project
(d) Durgapur	4. Damodar Valley Corporation

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	1	4	3	2
B.	2	3	4	1
C.	3	1	2	4
D.	4	2	1	3

349. Match List I with List II and select the correct answer using the code given below the lists:

List I (Steel Plant)	***List II (Source of Iron-ore)***
(a) Jamshedpur	1. Guru Mahisani mines
(b) Visvesvaraya	2. Dauli Rajhara mines
(c) Bhilai	3. Kemangundi mines
(d) Durgapur	4. Bolani Mines

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	3	2	4	1
B.	2	4	1	3
C.	4	1	3	2
D.	1	3	2	4

350. Which of the following is the only company which has developed the capability of the manufacturing of rigs used in off shore drilling?
A. The Mazgaon Dock Ltd.
B. The Bharat Heavy Electricals Ltd.
C. The Hindustan Machine Tools Ltd.
D. M/s Larsen and Toubro Ltd.

351. The production of cement in India was first started in 1904 at:
A. Kolkata B. Surat
C. Chennai D. Agra

352. Which of the Steel Plants and country of collaboration/assistance is wrongly matched?
A. Rourkela — Germany
B. Durgapur — United Kingdom
C. Bokaro — Former U.S.S.R.
D. Bhilai — U.K.

353. Maruti Udyog Ltd is located at:
A. Ranchi B. Patna
C. Gurgaon D. Faridabad

354. The Hindustan Aeronautics Ltd. (HAL) is situated at:
A. Kanpur B. Ahmedabad
C. Bengaluru D. Nagpur

355. Aero engines are manufactured at:
A. Chittaranjan (West Bengal)
B. Koraput (Orissa)
C. Salem (Tamil Nadu)
D. Jamshedpur (Jharkhand)

356. Tata Chemicals, Mithapur (Gujarat) is the largest production centre of:
A. Sulphuric acid B. Soda ash
C. Alcohol D. Pesticides

357. Which industry is basically dominated by private bodies?
A. Cement
B. Fertilizers
C. Iron and Steel
D. Paper

358. Location of an industry can be explained by traditional geographical factors. But sometimes the socio political considerations outweigh these geographical factors. The location of which of the following industries explains this fact?
A. Brass ware, Industry, Moradabad (Uttar Pradesh)
B. Textile Factory, Ahmedabad (Gujarat)
C. Fertilizer Plant, Jagdispur (Uttar Pradesh)
D. Aluminium Factory, Korba (Chhattisgarh)

359. Match List I with List II and select the correct answer using the code given below the lists:

List I (Industry)	***List II (Location)***
(a) D.D.T.	1. Sindri
(b) Tractor	2. Ranipur
(c) Heavy machinery	3. Alwaye
(d) Fertilizer	4. Faridabad

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	2	3	4	1
B.	1	2	3	4
C.	3	4	2	1
D.	4	1	3	2

360. Equipment of transmission towers and roadways are manufactured at:
A. Cochin, Panji, Paradeep
B. Ranchi, Naini, Tungabhadra
C. Bokaro, Haldia, Paradeep
D. Cochin, Haldia, Ballidila

361. Churk (Uttar Pradesh) is famous for:
A. Glass bangles
B. Hosiery
C. Cement industry
D. Electrical goods

362. National Inland Waterways No. 1 runs from:
A. Haldia to Allahabad
B. Sadiya to Dhubri
C. Both (A) and (B)
D. None of these

363. The commodity which accounts for maximum volume of goods transported by the Railways in India is:
A. iron and steel
B. coal
C. mineral oil
D. metallic ore (other than iron ore)

364. In India, which industry provides jobs to the maximum number of people?
A. Iron and steel
B. Cotton textiles

C. Sugar industry
D. Tea processing

365. Where is the prototype tools factory in Maharashtra situated?
A. Mumbai B. Pune
C. Ambernath D. Nasik

366. Which of the following manufactures Ambassador car?
A. Mahindra and Mahindra, Pune
B. Premier Automobiles, Mumbai
C. Standard Motors, Chennai
D. Hindustan Motors, Kolkata

367. Which of the following is uncorrectly matched?
A. Trucks — Jamshedpur
B. Standard Car — Chennai
C. Fiat Car — Mumbai
D. Jeep — Kolkata

368. Army trucks Shaktiman and Nissan are manufactured at:
A. Renukoot B. Perambur
C. Jabalpur D. Chittaranjan

369. The Diesel locomotive engines are manufactured at:
A. Varanasi B. Perambur
C. Chittaranjan D. Jamshedpur

370. Broad guage railway engines are manufactured at:
A. Chittaranjan B. Varanasi
C. Kanpur D. Baroda

371. Tanks are manufactured at:
A. Kanpur B. Avadi
C. Perambur D. Chittaranjan

372. MIG engines are manufactured at:
A. Koraput B. Kanpur
C. Nasik D. Bengaluru

373. Warships are manufactured at:
A. Mazagaon Shipyard
B. Visakhapatnam Shipyard
C. Hindustan Shipyard
D. Cochin Shipyard

374. Which of the following places is not the centre for manufacturing aircraft?
A. Koraput B. Renukoot
C. Bengaluru D. Adampur

375. Telephone cables are manufactured at:
A. Cochin B. Mumbai
C. Bengaluru D. Kanpur

376. Passenger and Merchant Ships are constructed at:
A. The Hindustan Shipyard at Visakhapatnam
B. Goa Shipyard
C. Cochin Shipyard
D. Mezagaon Docks

377. The land utilisation statistics in India is available to nearly:
A. 92.5 per cent of the total area
B. 98 per cent of the total area
C. 90 per cent of the total area
D. 85 per cent of the total area

378. The total arable land in India is:
A. 35 per cent B. 43 per cent
C. 15 per cent D. 51 per cent

379. **Assertion (A):** Nearly 5 per cent of the land in India falls in the category of fallow land.
Reason (R): The fallow lands are marginal lands and are cultivated not every year but once in two or three year.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

380. The area classified as cultivable wasteland has been estimated as:
A. 6.4 per cent of the total area
B. 10.4 per cent of the total area
C. 8.5 per cent of the total area
D. 3.2 per cent of the total area

381. Many parts of India face difficulty in producing multiple crops because:
A. temperature fluctuates in extreme
B. monsoons are unpredictable
C. water is not easily available
D. it is not economically satisfactory

382. Which of the following is the second most important crop of India?
A. Wheat B. Rice
C. Jawar D. Bajra

383. Pulses are grown all over the country except in the areas of:
A. unpredictable rainfall
B. very high temperature
C. very high rainfall
D. low rainfall

384. The essential features of shifting cultivation is:
A. rotation of crops
B. rotation of fields
C. single cropping
D. use of plenty of fertilizer

385. The proportion of area under rice to total cropped area is:
A. 30 percent B. 23 percent
C. 45 percent D. 50 percent

386. The first atomic power plant constructed in India was at:
A. Tarapur B. Narora
C. Kalpakkam D. None of these

387. The per capita availability of land in India is:
A. one fifth of a hectare
B. one third of a hectare
C. one seventh of a hectare
D. one sixth of a hectare

388. Most of India's cultivated land is under:
A. shifting cultivation
B. sedentry cultivation
C. tribal cultivation
D. Dry zone cultivation

389. Sugarcane cultivation in India is an example of:
A. plantation agriculture
B. shifting cultivation
C. irrigated cultivation
D. mechanised cultivation:

390. The communal system of farming is also known as:
A. Mahalwari System
B. Ryotwari System
C. Zamindari System
D. none of the above

391. The most important industrial crop of India is:
A. Sugarcane B. Cotton
C. Tea D. Coffee

392. Rice area is characterised by:
A. low density of population
B. moderate density of population
C. high density of population
D. none of the above

393. Which of the following is not Kharif crop?
A. Barley B. Rice
C. Maize D. Sesamum

394. Important beverage of Japan, sake is prepared by fermenting.
A. Wheat B. Rice
C. Barley D. Sorghum

395. Which of the following varieties of wheat occupies the largest area in India?
A. Triticum aestivum
B. T. durum
C. T. turgidum
D. T. dicoccum

396. Which region in India is known as the 'Rice Bowl of India'?
A. Indo — Gangetic Plain
B. Krishna — Godavari Delta Region
C. North — East Region
D. Kerala and Tamil Nadu

397. Almond (Badam) in India is cultivated chiefly.
A. Karnataka and Andhra Pradesh
B. Kerala and Tamil Nadu.
C. Asom and Meghalaya
D. Punjab and Kashmir

398. **Assertion (A):** The Coconut has been called a Kalpavrikasha.
Reason (R): The Coconut provides a large number of useful products such as ripe coconut copra, oil and coir.
A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

399. Potato was introduced in India in the:
A. 16th century
B. 17th century
C. 18th century
D. 19th century

400. Which of the following varieties of potato is the most suitable for hills and plains of northern India?
A. Kufri Sheetman
B. Kufri Jyoti
C. Kufri Alankar
D. Kufri Sinduri

401. Which of the following states in India leads in the production of Litchi?
A. Orissa
B. Bihar
C. Madhya Pradesh
D. Andhra Pradesh

402. Which of the following states in India is famous for its banana chips known as Nendran?
A. Karnataka
B. Tamil Nadu
C. Kerala
D. Maharashtra

403. Which of the following fruits is also known as Adam's fig and Apple of paradise?
A. Banana B. Mango
C. Guava D. Apple

404. Which of the following states in India leads in the production of pineapple?
A. Andhra Pradesh B. Asom
C. Bihar D. Tamil Nadu

405. Which of the following states in India leads in the production of apple?
A. Kashmir and Himachal Pradesh
B. Bihar and West Bengal
C. Asom and Meghalaya
D. Orissa and Andhra Pradesh

406. **Assertion (A):** Blossoming as well as fruiting of apple become insufficient in absence of chilled winters.
Reason (R): Chilling checks the dormancy period and induces the opening of burds in spring.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

407. 'Project Elephant' was launched in which of the following year?
A. 1992 B. 1986
C. 1996 D. 1982

408. When are the temperatures highest in Southern India?
A. June B. April
C. August D. July

409. Which of the following states has a monoply in the production of sandalwood oil?
A. Bihar B. Asom
C. West Bengal D. Karnataka

410. Central Tobacco Research Institute is located at:
A. Dharwar B. Ranchi
C. Rajahmundry D. Jodhpur

411. Cultivation of which crop in India is controlled by the government?
A. Coconut
B. Sun-flower
C. Eucalyptus
D. Opium-poppy

412. Government Opium Alkaloid Works is located at:
A. Guwahati B. Ludhiana
C. Ghazipur D. Indore

413. The great Darjeeling teas are grown against the backround of.....of the Himalayas.
A. Mount Kanchenjunga
B. Mount Everest
C. Mount Dhaulagiri
D. Nanga Parbat

414. Cultivation of which of the following classes of tea is commercially the most viable?
A. Green tea
B. Olonga tea
C. Unfermented tea
D. Black tea

415. Fenny is a cashew liquor commonly produced in:
A. Karnataka B. Gujarat
C. Bihar D. Goa

416. Which crop is cultivated mainly for its high protein content?
A. Linseed
B. Cotton seed
C. Groundnut
D. Soyabean

417. Match List I with List II and select the correct answer using the code given below the lists:

List I (Variety)	***List II (Crop)***
(a) Ratna	1. Wheat
(b) Ranjit	2. Jowar
(c) Java	3. Maize
(d) Narmada-112	4. Rice

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	4	3	2	1
B.	3	2	1	4
C.	2	1	4	3
D.	1	4	3	2

418. **Assertion (A):** Clay loam soils are the best suited for cultivation of rice.
Reason (R): Clay loam soils have high water holding capacity.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

419. Which one of the following types of soils are the most suited for tea cultivation?
A. Laterite soils B. Red soils
C. Black soils D. Alluvial soils

420. Major producer of spices like blackpepper, chillies cloves, ginger and cardamom in India is:
A. Malabar Coast Strip (Kerala and Maharashtra)
B. Himalaya Terai (Uttar Pradesh)
C. Brahmaputra Valley (Assam)
D. Darjeeling foothill (West Bengal)

421. The largest quantity of saffron is produced by:
A. Himachal Pradesh
B. Jammu and Kashmir
C. Asom
D. Andhra Pradesh

422. Sabarmati, Jamuna, Pankaj and Jagannath are high yielding varieties of:
A. wheat B. maize
C. barley D. rice

423. As sonara 64 is to wheat, so is IR-8 to:
A. maize B. rice
C. barley D. sorghum

424. Which of the following is a high yielding variety of maize?
A. Swarna B. Vijay
C. Sonalika D. T.N.L

425. **Assertion (A):** Certain parts of India are not ideally suited for wheat cultivation.
Reason (R): The winter season in these parts is short and relatively warm and dry.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

426. Which of the following plant diseases is an iron deficiency disease?
A. Dropsy B. Chlorosis
C. Crinkle D. Black heart

427. Ergot of grains is caused by a pathogen known as:
A. claviceps B. puccinia
C. ustilago D. xanthomonas

428. The disease, khaira, in rice is caused by:
A. Nematode parasite
B. Fungal parasite
C. Bacteria
D. Deficiency (in) of zinc

429. Rust of wheat is caused by:
A. puccina
B. ustilago
C. xanthomonas
D. helminthosporium

430. Which of the following is a serious pest of gram?
A. Sitotroga B. Alevrolobus
C. Heliothis D. Leptocorisa

431. Which of the following is a serious pest of jute?
A. Anomix B. Xylotrechus
C. Chilo D. Agrotis

432. Match List I with List II and select the correct answer using the code given below the lists:

List I (Pest)	***List II (Crop)***
(a) Pyrilla	1. Coffee
(b) Gandhi	2. Sugarcane
(c) Boll-warm	3. Rice
(d) Shoot-borer	4. Cotton

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	2	3	4	1
B.	1	4	3	2
C.	3	1	2	4
D.	4	2	1	3

433. **Assertion (A):** Coir industry is mainly concentrated in Kerala.
Reason (R): Coconut is mainly cultivated in Kerala.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

434. Which state is least irrigated in India?
A. Uttar Pradesh B. Punjab
C. Haryana D. Bihar

435. Which of the following is not an important source of irrigation in India?
A. Tanks B. Wells
C. Springs D. Canals

436. What percentage of the net irrigated area in India is under canal irrigation?
A. 24% B. 45
C. 55 D. 25

437. The maximum irrigated area is found in:
A. J&K B. U.P.
C. Punjab D. Haryana

438. In which of the following states would you not find Bhils?
A. Kerala
B. Uttar Pradesh
C. Karnataka
D. Madhya Pradesh

439. The multipurpose project irrigating maximum area in India is:
A. Beas
B. Bhakra Nangal
C. Damodar Valley
D. Hirakud

440. The Rajasthan Canal (Indira Gandhi Canal) draws its water from the:
A. Yamuna
B. Chambal
C. Sutlej and Beas
D. Chenab

441. Very high intensity of irrigation is found in:
A. Ganga-Yamuna Daob
B. Malwa Plateau
C. Eastern Uttar Pradesh
D. Central Bihar Plain

442. Match List I with List II and select the correct answer using the code given below the lists:

List I	***List II***
(a) Pong dam	1. Krishna
(b) Nargunasagar dam	2. Godavari
(c) Poochampad project	3. Bhagirathi
(d) Tehri dam	4. Beas

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	4	1	2	3
B.	4	3	2	1
C.	1	2	3	4
D.	2	3	4	2

443. In very high intensity irrigational areas the principal sources of irrigation are:
A. canals B. wells
C. tanks D. rains

444. More than half of the net irrigated areas in states of Gujarat, Maharashtra and Punjab are irrigated by:
A. tanks
B. rains
C. wells and tube-wells
D. dongs

445. **Assertion (A):** Canals are the most important sources of irrigation in India.
Reason (R): India has one of the world's largest canal system stretching over more than 1 lakh km.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

446. Irrigation is required in India because of
A. the low amount of rainfall
B. the growing of crops call for it
C. the uneven distribution of rainfall over space
D. the uneven distribution of rainfall over time

447. Which state in India has the largest area under irrigation interms of total acres?
A. Punjab B. Haryana
C. Tamil Nadu D. Uttar Pradesh

448. Which river has been harnessed under Bhakra Nangal Project?
A. Ganga B. Sutlej
C. Chenab D. Ravi

449. Tawa irrigation project is in:
A. Madhya Pradesh
B. Orissa
C. Maharashtra
D. Gujarat

450. **Assertion (A):** Large areas of Indian plateau are irrigated by means other than canal.
Reason (R): The digging of canals in rocky uneven areas is very expensive and of limited use.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

451. Which of the following groups of two states are benefitted by Tungabhadra project?
A. West Bengal and Orissa
B. Gujarat and Rajasthan
C. Andhra Pradesh and Karnataka
D. Kerala and Tamil Nadu

452. Which of the following projects comprises the Gandhi Sagar dam, the Jawahar Sagar dam and the Rana Pratap Sagar dam?
A. Rihand project
B. Machkund project
C. D.V.C. project
D. Chambal project

453. Match List I with List II and select the correct answer using the code given below the lists–

List I (Irrigation Project)	***List II (Rivers)***
(a) Bhima	1. Mahanadi
(b) Ukai	2. Godavari
(c) Pochampad	3. Tapti
(d) Hirakud	4. Pawana

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	4	3	2	1
B.	3	4	1	2
C.	1	4	3	2
D.	1	2	4	3

454. .....is a good milker buffalo distributed through out Paunjab, Haryana and Uttar Pradesh.
A. Nili B. Ravi
C. Murrah D. Jaffarabadi

455. The breed of goat, Beetat is found in:
A. Tamil Nadu
B. Punjab
C. Andhra Pradesh
D. Orissa

456. The breeds of Buffalo, Nili and Ravi are common in:
A. Maharashtra B. Karnataka
C. West Bengal D. Punjab

457. Location of which of the following organisations in not correct.
A. Central Arid zone Research Institute—Jodhpur
B. Indian Veterinary Reasearch Institute—Izatnagar.
C. National Dairy-development Board—Surat
D. National Dairy Research Institute—Karnal

458. In which state of India sheep with quality wool are reared?
A. Uttar Pradesh
B. Jammu and Kashmir
C. Madhya Pradesh
D. Himachal Pardesh

459. Indian Railway system is the largest in Asia and the.....largest in the world.
A. Second B. Third
C. Fourth D. Fifth

460. The India railways entered in the metro age with the opening of.....metro railway in 1984-85.
A. Delhi B. Kolkata
C. Chennai D. Mumbai

461. Which of the following two cities have the headquarters of two railway zones?
A. Madras and Gorakhpur
B. Guwahati and Secunderabad
C. Mumbai and Kolkata
D. Delhi and Madras

462. The Indian railways are the.....largest electified system in the world.
A. First B. Second
C. Third D. Fourth

463. Which of the following Indian railway zones covers the maximum distance?
A. North-eastern zone
B. North zone
C. Central zone
D. Western zone

464. Match List I with List II and select the correct answer using the code given below the lists:

List I (Railway Zone)	***List II (Headquarter)***
(a) Southern	1. Secunderabad
(b) South central	2. Gorakhpur
(c) North eastern	3. Kolkata
(d) South eastern	4. Chennai

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	2	1	3	4
B.	4	1	2	3
C.	1	4	3	2
D.	2	4	1	2

465. Which of the following states is not covered under the western railway-zone?
A. Gujarat B. Maharashtra
C. Rajasthan D. Bihar

466. Which of the following is the first super-fast train in India?
A. Magadh Express
B. Sampurna Kranti
C. Jansatabdi
D. Rajdhani express

467. The first train commenced in April 1853 between Bombay to Thane covered a distance of.....km.
A. 312 km. B. 165 km.
C. 34 km. D. 70 km.

468. Which of the following is the largest railway bridge in India?
A. Howrah bridge (West Bengal)
B. Sone bridge (Bihar)
C. Eldrin bridge (Uttar Pradesh)
D. Old Yamuna bridge (Delhi)

469. Which of the following is the longest rail route?
A. Delhi — Mumbai
B. Delhi — Kolkata
C. Guwahati — Trivandrum
D. Amritsar — Pune

470. **Assertion (A):** No railway line has been constructed in Tripura, Mizoram, Manipur and Nagaland.
Reason (R): The cost involved in providing railway tracks in the hilly terrain and forested tracts is too high.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

471. **Assertion (A):** The rail network in the whole peninsular region is very dense.
Reason (R): The whole of the peninsular region has a hilly and plateau terrain.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

472. Indian railways have been divided into..... zones.
A. 20 B. 19
C. 16 D. 17

473. The Railway Staff College is located to:
A. Baroda B. Allahabad
C. Lucknow D. Patna

474. Which of the following two cities will be connected by a broad guage line under the project Konkan railway corporation limited?
A. Pune and Chennai
B. Trivandrum and Mangalore
C. Mumbai and Mangalore
D. Ernakulam and Bengaluru

475. Which of the following states does not share the line constructed by Konkan Railway Corporation Limited?
A. Maharashtra B. Goa
C. Karnataka D. Kerala

476. The state with the highest density of road is:
A. Karnataka B. Kerala
C. Maharashtra D. Punjab

477. Amongst the union territories has the highest road density.
A. Delhi B. Lakshadweep
C. Chandigarh D. Pondicherry

478. Which of the following shipyards makes warships for the Indian Navy?
A. Cochin Shipyard, Cochin
B. Hindustan Shipyard, Vishakhapattanam
C. Mazagon Dock, Mumbai
D. Garden Reach Workshop, Kolkata

479. Which of the following National highways is the longest one?
A. National Highway-2
B. National Highway-3
C. National Highway-4
D. National Highway-44

480. National highway 7-links:
A. Agra with Mumbai
B. Varanasi with Kanyakumari
C. Nagpur with Madurai
D. Kolkata with Amritsar

481. Which of the following National Highways is known as Sher Shah Suri Marg?
A. National Highway-1
B. National Highway-2
C. National Highway-3
D. National Highway-5

482. Chhotanagpur in Jharkhand is famous for:
A. oil refinery B. textiles
C. oranges D. lac industry

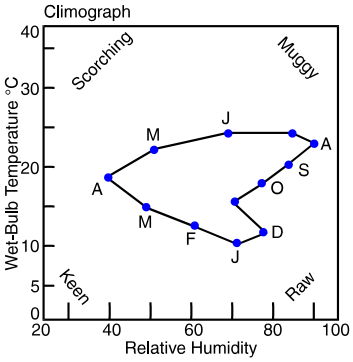
483. Which of the following is a Kharif crop?
A. Barley B. Gram
C. Rice D. Wheat

484. India imports long staple cotton from:
A. U.S.A. B. Egypt
C. Sudan D. All of these

485. **Assertion (A):** India and Pakistan have relatively little foreign trade.
Reason (R): Minerals and crops are absorbed almost entirely by the large population of India and Pakistan.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

486. Which one of the following provides the correct sequence of occurance of four towns/cities as one proceeds from west to east?
A. Rajkot, Baroda, Kharagpur, Bilaspur
B. Bikaner, Aligarh, Darbhanga, Nowgong
C. Indore, Rourkela, Agartala, Jamshedpur
D. Nasik, Aurangabad, berhampur, Nanded

487. Consider the climograph given below:



The above climograph relates to
A. North-western region of India
B. Southern region of India
C. Mid central region of India
D. North-eastern region of India

488. In Mizoram the settlement pattern is mostly of linear type along the ridge because:
A. the valleys are cooler than ridges
B. accessibility is easier on the ridge tops
C. the ridges are cooler than the valleys
D. the valleys are densely forested

489. A rainy day as defined by the Indian meterological department is a day when the rainfall at a point received is:
A. 0.5 mm to 1mm in 24 hours
B. 1.1 mm to 1.5 mm in 24 hours
C. 1.6 mm to 2 mm in 24 hours
D. Above 2.5 mm in 24 hours

490. Which among the following pairs of places have the most marked difference in total rainfall per annum even though located approximately along the same latitude?
A. Bengluru and Chennai
B. Mumbai and Vishakhapatanam
C. Ajmer and Shillong
D. Nagpur and Kolkata

491. Soils of western Rajasthan have a high content of:
A. Aluminium
B. Calcium
C. Nitrogen
D. Phosphorus

492. The Neyveli thermal power plant is fed by:
A. Gondwana coal
B. Tertiary coal
C. Quaternary coal
D. Cambrian coal

493. According to the ancient Indian geographical concept" Bharatavarshas" was a part of:
A. Pushkaradweepa
B. Jambudweepa
C. Kraunchadweepa
D. Kushadweepa

494. Consider the map given below.



Two tourists travelling from Delhi, one to Karachi and other to Bhuj wanted to

have company. The railway junction upto which they can travel together as shown in the map is:

A. Dhulera B. Jodhpur
C. Luni D. Butotra

495. Which one of the following shows the descending order of the four metropolitan cities in India in so far as their population strength is concerned?

A. Mumbai, Kolkata, Ahmedabad, New Delhi
B. Mumbai, Kolkata, New Delhi, Ahmedabad
C. Mumbai, Kolkata, Ahmedabad, New Delhi
D. Mumbai, New Delhi, Kolkata, Ahmedabad

496. The hall mark of watershed development in the semi arid regions of India is the:

A. establishment of sheds on large scale, so that the rain water does not evaporate.
B. undertaking of earth works, soil conservation, in ensures and tree plantation so as to conserve soil moisture and recharge undergound water
C. drilling deep tube-wells so as to tap water at the rock strata level
D. setting up a system of tanks by embanking water from seasonal rivers

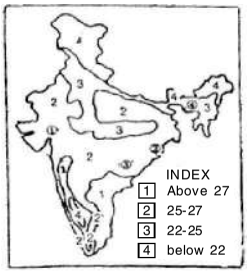
497. In ancient historical geography the name Ratnakara denoted:

A. the Arabian Sea
B. the Bay of Bengal
C. the Indian Ocean
D. the influence of the Ganga, the Yamuna and the mythical Saraswati at Prayaga

498. Which one of the following is the most important reason for the establishment of the Vikram Sarabhai Space Centre at Thumba?

A. The sea is near to the place in the east, west and south direction
B. It is a place near to a city in India, which is nearest to the geographical equator
C. It is situated on the geomagnetic equator
D. Outer space near Thumba exhibits queer atmospheric phenomena

499. Consider the map given below:



The map read with the index provided refer to the distribution of:

A. Winter rains
B. Pressure
C. Annual rainy days
D. Mean temperature

500. The only anthropoid ape to be found in India is the:

A. Hanuman monkey
B. Lion tailed macaque of western ghats
C. Slow Loris of Assam
D. White browed gibbon of Assam

501. The highest milk producing breed of goat in India is:

A. Barbari B. Jamnapari
C. Block Bengal D. Beetal

502. **Assertion (A):** The monsoon rainfall decreases as one goes north west in the Ganga plain.

Reason (R): The moisture bearing monsoonal winds go higher up as one moves up in the Ganga Plain.

A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

503. Which of the following types of erosion is responsible for the formation of Chambal Ravines?
A. Splash B. Sheet
C. Rill D. Gully

504. Self sufficiency in food, in the true sense of freedom from hunger, has not been achieved in India inspite of a more than three fold rise in food grains production over 1950-2010. Which of the following are the reasons for it.
1. The green revolution has been restricted to small pockets of the country.
2. The cost of food is too high compared to the earnings of the poor.
3. Too much emphasis is laid on wheat and paddy compared to the coarse grains.
4. The grains of the green revolution have largely accrued to the cash crop rather than food crops.

Select the correct answer from the codes given below:
Codes:
A. 1, 2 and 3
B. 1, 2 and 4
C. 1, 3 and 4
D. 2, 3 and 4

505. Surti is a breed of .....
A. Cattle
B. Buffalo
C. Sheep
D. Goat

506. Which of the following periodical winds blowing the sea to land cause summer Mansoon in India?
A. East West B. South West
C. South East D. North East

507. Which of the following soil types of India is rendered in fertile by the presence of excess iron?
A. Desert sand B. Alluvial
C. Podzolic D. Leteric

508. Which of the following fish are bred exclusively in the cold region of India?
1. Catla 2. Tinca
3. Bhetki 4. Trout

Codes:
A. 1 and 2 B. 1 and 4
C. 2 and 4 D. 3 and 4

509. Match List I with List II and select the correct answer using the code given below the lists:

List I (Project)	***List II (River)***
(a) Almatti	1. Tapi
(b) Idukki	2. Ravi
(c) Ranjit Sagar	3. Krishna
(d) Ukai	4. Periyar

Codes:

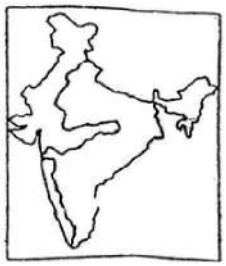
	(a)	*(b)*	*(c)*	*(d)*
A.	3	4	2	1
B.	4	3	2	1
C.	1	2	3	4
D.	2	1	4	3

510. Though the railways are the most pervasive mode of transport in India. It is the road transport which received the maximum impetus in most of the post independence period. Which one of the following are the reasons for this?
1. Railways are cheap to operate but the associated capital costs are very high.
2. Given the geographic spread of the human settlements. It is unrealistic that the railways alone can serve the needs of transport.
3. The per unit (tonne/km) cost of transport is cheaper in road compared to rail transport.
4. Given to indivisible nature of the railways it is not always convenient for the population to avail of it with the same ease as private car, buses or two wheelers.

Select the correct answer from the codes given below:
Codes:
A. 1, 2 and 3 B. 1, 2 and 4
C. 1, 3 and 4 D. 2, 3 and 4

511. Why is Gujrat, the largest producer of salt in India?
A. Gujrat possesses the largest dry coastal area
B. The sea water here is more saline
C. Gujrat farmers are highly skilled in making salt
D. Gujrat has large areas of shallow sea

512. Consider the map of India given below:



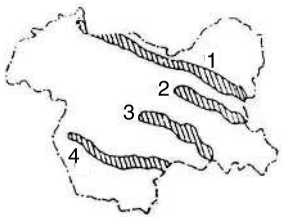
The map shows:
A. An Isohyet
B. All India water divide
C. A combination of national highways
D. A combination of major railway routes

513. The Himalayas are formed of parallel fold ranges of which the oldest range is:
A. The Siwalik range
B. The Lesser Himalayas
C. The great Himalayan range
D. The Dhauladhar range

514. Which one of the following does not belong to biosphere reserves set up so far?
A. Great Nicobar B. Sunderbans
C. Nanda Devi D. Gulf of Kachchh

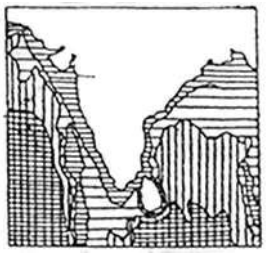
515. Which one of the following mountain ranges is spread over only one state in India?
A. Aravalli B. Satpura
C. Ajanta D. Sahyadri

516. Examine the map of Jammu & Kashmir given below:



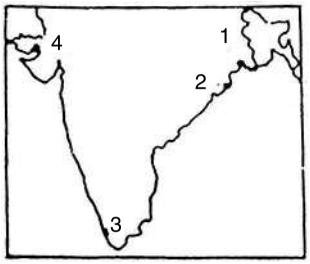
The mountain ranges marked 1, 2, 3 and 4 are respectively.
A. Ladakh, Zaskar, Karakoram and Pir Panjal
B. Karakoram, Ladakh, Zaskar and Pir Panjal
C. Karakoram Zaskar Pir Panjal and Ladakh
D. Ladakh, Pirpanjal, Karakoram and Zaskar

517. Consider the map given below:



The divisions along India's costal region indicates:
A. Coastal pollution zones
B. Salinity density Isopleths
C. The area up to which sovereignty extends
D. Under water relief contours.

518. Of the four places marked 1, 2, 3 and 4 on the map, the one indicating a tidal port is:



A. 1 B. 2
C. 3 D. 4

519. The Indian subcontinent was originally part of a huge landlass called:
A. Jurassic landmass
B. Arya varta
C. Indiana
D. Gondwana continent

520. Alpine vegetation in the western Himalayas is found only upto a height of 3000 metre while in the eastern Himalayas it is found up to a height of 4000 metre. The reason for this variation in the same mountain range is that:
A. Eastern Himalayas are higher than western Himalayas
B. Eastern Himalayas are nearer to the equator and sea-coast than western Himalayas.
C. Eastern Himalayas get more monsoon rainfall than the western Himalayas
D. Eastern Himalayas rocks are more fertile than the western Himalayan rocks.

521. What is Obra?
A. Copper project in Rajasthan
B. Super thermal power project in Uttar Pradesh
C. Atomic power plant at Kalpakkam
D. Hydro-electric project in Uttar Pradesh

522. The palaeomagnetic results obtained from India indicate that in the past, the Indian landmass has moved.
A. Northward B. Southward
C. Eastward D. Westward

523. Monoculture of commercially viable trees is destroying the unique natural profile of thoughtless exlplotation of timber deforesting vast tracts for palm cultivation, destruction of mangroves, illegal logging by tribals and poaching only compound the problem fresh water pockets are fast drying up due to deforestation and destruction of mangroves" The place referred to in this quotation is:
A. Sunderbans
B. Kerala Coast
C. Orissa Coast
D. Andaman and Nicobar Islands

524. Tribal settlements in India are usually concentrated:
A. on the plains
B. near big rivers
C. in the hilly and forested areas
D. on the periphery of townships

525. Which one of the following regions of India is now regarded as an ecological hot spot?
A. Western Himalayas
B. Eastern Himalayas
C. Western Ghats
D. Eastern Ghats

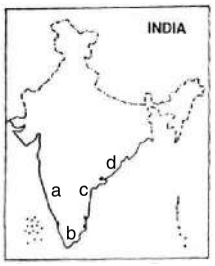
526. Which one of the following areas of India produces largest amount of cotton?
A. North western India and Gangetic West-Bengal
B. North west and western India
C. Western and southern India
D. Plains of northern India

527. The Pak strait lies between:
A. Gulf of Kachchh and Gulf of Khambhat
B. Gulf of Mannar and Bay of Bengal
C. Lakshadweep and Maldive Islands
D. Andaman and Nicobar Islands

528. Which one of the following sets of commodities are exported to India by arid and semi arid countries in the Middle East?
A. Raw wool carpets
B. Fruits and palm oil
C. Precious stones and pearls
D. Perfume and coffee

529. Consider the following rivers:
1. Kishenganga 2. Ganga
3. Wainganga 4. Penganga
Codes:
A. 1, 2, 3, 4
B. 2, 1, 3, 4
C. 2, 1, 4 and 3
D. 1, 2, 4 and 3

530. Match the different ports of union territory of Pondicherry labelled as a b, c and d in the given map with their respective names select the correct answer using the codes given below the list of ports.



List I (Ports of Puducherry)

1. Karaikal
2. Mahe
3. Puducherry
4. Yanam

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	2	1	3	4
B.	1	2	3	4
C.	2	1	4	3
D.	1	2	4	3

531. Which one of the following pairs of primitive tribes and places of their inhabitation is not correct matched?
A. Buksa — Pauri-Garhwal.
B. Kol — Jabalpur.
C. Munda — Chhotanagpur.
D. Korba — Kodagu.

532. Along which one of the following meridians did India experience the first light of the sunrise of the new millennium?
A. 2°30'W. B. 82°30'E.
C. 92°30'W. D. 92°30'E.

533. Consider the following statements:
1. Tides are of great help in navigation ands fishing.
2. High tides enable big ships to enter or leaves the harbour safely.
3. Tides prevent siltation in the harbours
4. Kandla and diamond harbour are tidal ports.

Which of these statements are correct?
Codes:
A. 1 and 4 B. 2, 3 and 4
C. 1, 2 and 3 D. 1, 2, 3 and 4

534. Consider the following statements about the mega cities of India.
1. Population of each mega city is more than 5 million.
2. All the mega cities are important seaports.
3. Mega cities are either national or state capitals.

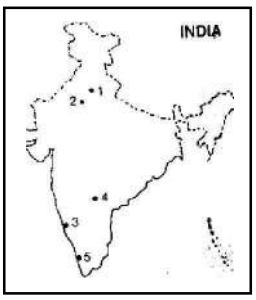
Codes:
A. 1, 2 and 3 B. 1 and 2
C. 2 and 3 D. 1 and 3

535. The correct sequence in decreasing orde of the four sugarcane producing states in India is:
A. Maharashtra, Uttar Pradesh, Tamil Nadu, Andhra Pradesh.
B. Uttar Pradesh, Maharashtra, Tamil Nadu, Andhra Pradesh.
C. Maharahstra, Uttar Pradesh , Tamil Nadu.
D. Uttar Pradesh, Maharashtra, Andhra Pradesh, Tamil Nadu.

536. Consider the following statements:
1. Maharashtra has the highest acreage under jawar in India.
2. Gujarat is the largest producer of groundnut in India.
3. Rajasthan has the largest area of cultivable waste lands in India.
4. Andhra Pradesh as the highest per hectare yield of maize in India.

Which of these statements are correct?
Codes:
A. 1 and 4 B. 2 and 3
C. 1 and 3 D. 2 and 4

537. Match the cities labelled as 1, 2, 3, 4 and 5 in the given map with the name of the institutes located in these cities and select the correct answer using the code given below the names of the institute.



Name of the Institutes

(a) Central marine fisheries research institute
(b) Central Sheep Breeding Farm
(c) National Dairy Research Institute
(d) National Institute of Agricultural extension managment

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	5	1	3	2
B.	5	2	1	4
C.	4	2	1	3
D.	1	2	3	4

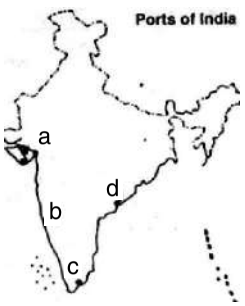
538. Match List I with List II and select the correct answer using the code given below the lists:

List I (Industrial Unit)	***List II (Centre)***
(a) Atlas cycle Co. Ltd.	1. Bengluru
(b) Bharat Earth Movers Ltd.	2. Bhubaneswar
(c) Indian Farmers Fertilizers Co-operative Ltd.	3. Kalol
(d) National Aluminium Co. Ltd.	4. Sonepat

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	1	4	2	3
B.	1	4	3	2
C.	4	1	2	3
D.	4	1	3	2

539. Match the location of ports labelled as a, b, c, d, in the given map with the names of those ports and select the correct answer using the code given below the name of the ports.



Name of the Ports

1. Kakinada
2. Karwal
3. Mangalore
4. Tuticorn
5. Veraval

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	4	2	3	5
B.	5	2	4	1
C.	1	3	4	2
D.	5	3	2	1

540. Transhu mance is practised by the:
A. Bhotias B. Bhoksas
C. Jaunsaris D. Tharus

541. Vembanad Lake is in:
A. Andhra Pradesh B. Kerala
C. Odisha D. Tamil Nadu

542. Which one of the following is not correctly matched?
A. Chennai—The deepest port of India
B. Cochin—A natural harbour
C. JawaharLal Nehru port only mechanised port in India
D. Kandla—A tidal port

543. The blue revolution is related with:
A. Food grain production
B. Oilseed production
C. Milk production
D. Fish production

544. Devasthal is famous for:
A. finding relics of ancient civilisation
B. installation of the largest telescope in Asia
C. plan to develop a large herbal garden
D. renovation of an ancient shrine

545. In which of the following areas is Konkani spoken as the local language?
A. Kerala and Karnataka
B. Maharashtra nad Goa
C. Odisha and West Bengal
D. Andhra Pradesh

546. The Green Revolution involved the use of high yielding varieties of seeds which require:
A. less fertiliser and less water
B. more fertiliser and less water

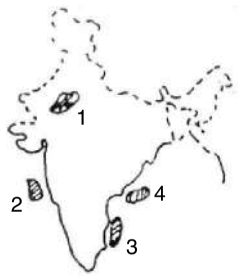
C. less fertiliser and more water
D. more fertiliser and more water

547. Some people in Manipur live in houses built on floating islands of weeds and decaying vegetation held together by suspended silt. These islands are called:
A. Tipis. B. Barkhans.
C. Phoomdis. D. Izba.

548. Which one of the following east flowing rivers of India has rift valley due to down warping?
A. Damodar B. Mahanadi
C. Sone D. Yamuna

549. The discovery of oak flora in 1966 added a new chapter to the history of Indian sericulture which one of the following states is the leading producer of oak tasar silk.
A. Manipur B. Bihar
C. Asom D. Odisha

550. Commercial production of mineral oil has started recently in which one of the areas of India, labelled 1, 2, 3 and 4 in the rough given below:



A. 1 B. 2
C. 3 D. 4

551. Match List I with List II and select the correct answer using the code given below the list:

List I (Minerals)	***List II (Mining area)***
(a) Graphite	1. Bellary
(b) Lead	2. Didwana
(c) Salt	3. Rampa
(d) Silver	4. Zawar

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	3	4	2	1
B.	1	4	2	3
C.	3	1	4	2
D.	2	3	1	4

552. Which of the following is not an important reason for the suitability of the Mumbai for textile industry?
A. Moist climate
B. Availability of cheap labour
C. Great demand for textile in Mumbai
D. Availability of raw material

553. Which one of the following languages belongs to the Austria group?
A. Marathi
B. Ladakhi
C. Khasi
D. Tamil

554. The most urbanised state in India is:
A. Gujarat B. Maharashtra
C. Tamil Nadu D. West Bengal

555. Match List I with List II and select the correct answer using the code given below the lists:

List I (Places)	***List II (Industries)***
(a) Jamnagar	1. Aluminium
(b) Hospet	2. Woollen textile
(c) Korba	3. Fertilizers
(d) Haldia	4. Cement
	5. Iron and Steel

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	4	3	1	2
B.	2	5	1	3
C.	4	5	2	1
D.	2	1	4	3

556. In the vicinity of Mumbai, a number of specialised towns have been developed, match the lists of specialisation with towns and select the correct answer using the code given below the lists:

List I (Towns)	***List II (Specialization)***
(a) Alibag	1. Fishing centre
(b) Balapur	2. Holiday resort
(c) Nhova Sheva	3. Petro-chemical complex
(d) Ratnagiri	4. Port

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	1	3	2	4
B.	2	3	4	1
C.	3	4	2	1
D.	2	1	4	3

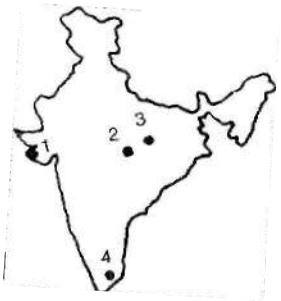
557. Match List I with List II and select the correct answer using the code given below the lists:

List I	***List II***
(a) Jaracoas	1. Tamil Nadu
(b) Abor	2. Himachal Pradesh
(c) Kotas	3. Bihar
(d) Gaddi	4. Arunachal Pradesh
(e) Banjara	5. Andaman & Nicobar

Codes:

	(a)	*(b)*	*(c)*	*(d)*	*(e)*
A.	5	4	1	2	3
B.	4	5	2	1	3
C.	5	4	3	1	2
D.	1	2	3	4	5

558. The rough outline map given shows centres of cements industry labelled 1, 2, 3 and 4. Match these centres with the following sets of name.



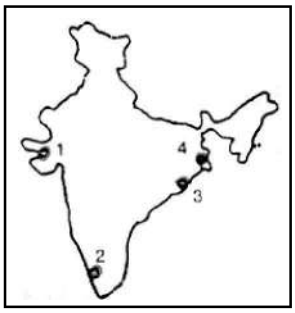
(a) Katni *(b)* Tirunelveli
(c) Sikka *(d)* Churk

Select the correct answer using the codes given below:

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	3	4	2	1
B.	2	4	1	3
C.	1	2	4	3
D.	2	3	1	4

559. Which one of the following ports shown on the rough outline map of India is a riverine port?



A. 1 B. 2
C. 3 D. 4

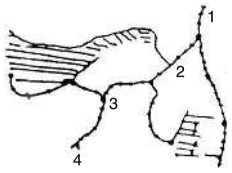
560. What is the correct sequence of the following Indian states in descending order of their length of national highway per 100 km^2 of their area?

1. Haryana
2. Maharashtra
3. Punjab
4. Tamil Nadu

Select the correct answer using the code given below:

A. 1, 3, 4, 2
B. 4, 3, 1, 2
C. 3, 4, 1, 2
D. 3, 4, 2, 1

561. The four railway junctions shown by numerals 1, 2, 3, 4 on the rough outline map of Gujarat are respectively:



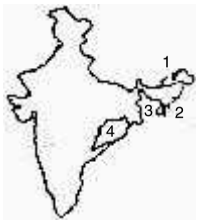
A. Palanpur, Mahesana, Ahmedabad and Vadodara
B. Mahesana, Surendranagar, Rajkot and Junagarh
C. Palanpur Kanda, Bhuj and Okla
D. Ahmedabad, Vadodara, Bhavnagar and Branch

562. Which one of the following is the correct sequence of the states labelled 1, 2, 3 and 4 of India shown on the map in descending order in terms of their available ground water resources for irrigation?



A. 3, 4, 1, 2 B. 3, 4, 2, 1
C. 4, 3, 1, 2 D. 4, 3, 2, 1

563. Among the Indian States shown labelled 1, 2, 3 and 4 in the rough outline map given, the correct sequence of descending order of percent of scheduled tribe population to their total population is:



A. 1, 3, 2, 4 B. 3, 1, 2, 4
C. 3, 1, 4, 2 D. 1, 3, 4, 2

564. Which one of the following sets of states stands to benefit the most from the Konkan railway?
A. Goa, Karnataka, Maharashtra, Kerala
B. Madhya Pradesh, Maharashtra, Tamil Nadu, Kerala
C. Tamil Nadu, Kerala, Goa, Maharashtra
D. Gujarat, Maharashtra, Goa, Tamil Nadu

565. Match the following research institutes A, B,C and D with their respective location labelled as 1 to 6 in the given rough outline map.



(a) Central Drug Research Institutes.
(b) National Atlas and Thematic Mapping Organisation
(c) National Institute of ocean technology.
(d) Temperature Forest Research centre.
Select the correct answer using the code given below:
Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	4	3	2	6
B.	4	5	1	6
C.	2	3	4	5
D.	1	6	2	3

566. Which one of the following pairs is not correctly matched?
A. Bomdila — Arunachal Pradesh
B. Nathula — Sikkim
C. Bhorghat — Himachal Pradesh
D. Palghat — Kerala

567. The most urbanised state in India is:
A. Gujarat B. Maharashtra
C. Tamil Nadu D. West Bengal

568. Which one of the following is not the oil producing field of Gujarat?
A. Kalol
B. Lunoz
C. Koshamba
D. Badarpur

569. Which among the following are in the private sector?
1. Bongaigaon Refinery
2. Mangalore

3. Haldia Refinery
4. Essar Oil Ltd.

Select the correct answer from the codes given below:

Codes:

A. 1 and 2 B. 2 and 3
C. 2 and 4 D. 1 and 4

570. The population of four states in the country in descending order in 2011 is:
A. West Bengal, Maharashtra, Madhya Pradesh, Tamil Nadu.
B. Maharashtra, Madhya Pradesh, West Bengal, Tamil Nadu.
C. Maharashtra, West Bengal, Madhya Pradesh, Tamil Nadu
D. Madhya Pradesh, Maharashtra, Tamil Nadu, West Bengal.

571. Shifting cultivation is a major problem in the hilly areas of:
A. Asom and Bihar
B. Bihar and Orissa
C. Orissa and Madhya Pradesh
D. Maharashtra and Uttar Pradesh

572. Match List I with List II and select the correct answer using the code given below the lists:

List I	***List II***
(a) Manganese	1. Orissa
(b) Asbestos	2. Madhya Pradesh
(c) Nickel	3. Rajasthan
(d) Zinc	4. Andhra Pradesh

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	1	2	3	4
B.	4	3	2	1
C.	3	4	1	2
D.	2	4	1	3

573. The best cooking coal is mostly obtained from:
A. Jharia B. Neyveli
C. Raniganj D. Singrauli

574. Which one of the following is the land area in the extreme south of India?
A. Cape Camorin B. Indira Point
C. Rameshwaram D. Pondicherry

575. **Assertion (A):** Northern plains of India receive some precipitation during winter season.
Reason (R): North east monsoon is active during winter.
Select the correct answer from the codes given below.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

576. Chhotanagpur's contribution to India's coal production is nearly:
A. 40 per cent B. 20 per cent
C. 60 per cent D. 80 per cent

577. "The Queen of Hills" will soon be included in the UN Heritage list it is:
A. Hill Station B. Mountain Peak
C. Toy Train D. Tree

578. **Assertion (A):** India is a monsoon country.
Reason (R): The high Himalayas impart its climatic distinctiveness.
Select the correct answer from the codes given below.

Codes:

A. Both A and R are true and R is the correct explanation of A.
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

579. According to the census of 2011 the highest literary rate was recorded in Kerala, followed by:
A. Chandigarh
B. Delhi
C. Mizoram
D. Puducherry

580. Match List I with List II and select the correct answer using the code given below the lists:

List I	***List II***
(a) Coal	1. Kudremukh
(b) Copper	2. Zawar
(c) Iron-ore	3. Khetri
(d) Silver	4. Talcher

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	1	2	3	4
B.	2	1	4	3
C.	4	3	1	2
D.	3	2	4	1

581. The maximum power in India comes from _____ plants.
A. thermal B. hydro-electric
C. nuclear D. solar

582. Match List I with List II and select the correct answer using the code given below the lists:

List I (States)	***List II (National Parks)***
(a) Uttarakhand	1. Bandipur
(b) Asom	2. Rajaji National Park
(c) Orissa	3. Similipal
(d) Karnataka	4. Manas

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	1	2	3	4
B.	2	4	3	1
C.	4	3	2	1
D.	2	3	1	4

583. What is the difference between Indian standard time and Greenwich standard time?
A. – 4 hours and 30 minutes
B. – 5 hours
C. + 5 hours and 30 minutes
D. + 6 hours and 30 minutes

584. Telgu Ganga project is intended to solve the drinking water problem of which of the following cities?
A. Hyderabad B. Bengaluru
C. Chennai D. Cochin

585. Which place is known as Queen of the Arabian Sea?
A. Kochi B. Alappuzha
C. Kandla D. Mumbai

586. The place Sabarimala is situated in which of the following states?
A. Andhra Pradesh B. Tamil Nadu
C. Kerala D. Karnataka

587. Which of the following pairs of cities are connected by the bus service between India and Pakistan?
A. Amritsar — Lahore
B. Islamabad — Delhi
C. Karachi — Delhi
D. Lahore — Delhi

588. Which of the following is also known by the name of Sahyadri range?
A. Eastern ghats B. Western ghats
C. Shiwaliks D. Vindhayas

589. Which of the following occur more frequently, than the other three in the Indian ocean?
A. Cyclones B. Tornadoes
C. Hurricanes D. Typhoons

590. India's permanent research Station Dakshin Gangotri is situated in the:
A. Great Himalayas
B. Indian Ocean
C. Antarctica
D. Arabian Sea

591. Irrigation through canals, tube-wells tanks, etc is resorted to in India because:
A. The country has a large number of rivers, big and small.
B. The failure of rains or inadequate rain can prove highly detrimental to crop production.
C. It is easy to regulate water supply to plants according to their needs.
D. It is too much expensive to store rain water.

592. Which of the following states has the literacy rate lower than the national average?
A. Karnataka
B. West Bengal
C. Andhra Pradesh
D. Maharashtra

593. The distance between New Delhi and which of the following Stations by rail is the shortest?
A. New Delhi – Thiruvananthapuram
B. New Delhi – Bengaluru
C. New Delhi – Chennai
D. New Delhi – Guwahati

594. Pong Dam is a venture undertaken jointly by which of the following groups of states?
A. Haryana, Punjab and Rajasthan
B. Andhra Pradesh, Madhya Pradesh and Orissa
C. Gujarat, Maharashtra and Rajasthan
D. Gujarat, Madhya Pradesh and Orissa

595. Which of the following parts of India produces nearly two-thirds of the total quantity of tea?
A. North East–India
B. Northern India
C. Southern India
D. North West India

596. To which of the following eras does the Aravalli system belong?
A. Palaeozoic B. Mesozoic
C. Cainozoic D. Precambrian

597. Which part of India receives rain when the summer monsoon recedes?
A. North east India
B. Malabar Coast
C. Tamilnadu Coast
D. Orissa

598. Mangrove vegetation in India is most extensive in:
A. Rann of Kutch
B. Malabar
C. Sunderbans
D. None of these

599. The rivers included in which of the following groups flow into the Bay of Bengal?
A. Narmada, Ganges and Brahmaputra.
B. Brahmaputra, Ganges and Godavari
C. Cauveri, Krishna and Narmada
D. Krishna, Godavari and Tapti

600. To which of the following types does the natural vegetation of the western ghats belong?
A. Evergreen B. Mangrove
C. Deciduous D. Alpine

601. With the addition of the new sea port of Navasheva the number of major seaports on the western coast of India is.
A. 4 B. 5
C. 6 D. 7

602. Who demarcated the line which divides India and Pakistan?
A. Lord Mountbatten
B. Sir Henry McMohan
C. Sir Mortimer Durand
D. Sir Cyril Rad Cliffe

603. According to the 2011 census the states with the lowest and the highest density of population are respectively:
A. Nagaland and West Bengal
B. Madhya Pradesh and Bihar
C. Arunachal Pradesh and Bihar
D. Arunachal Pradesh and Orissa

604. **Assertion (A):** Madhya Pradesh is the leading producer of Limestone in India.
Reason (R): The entire output of Limestone in Madhya Pradesh is obtained from the Barakar series.
In the context of the above two statements which one of the following is correct.
Codes:
A. Both A and R are true and R is the correct explanation of A.
B. Both A and R are true but R is not the correct explanation of A.
C. A is true but R is false.
D. A is false but R is true.

605. Cash crops of India include:
A. Cotton and Sugarcane
B. Maize, Jowar and Paddy
C. Bajra and Paddy
D. Paddy and Jowar

606. **Assertion (A):** Godavari is often referred to as "Dakshin Ganga" or "Vridha Ganga".

Reason (R): Godavari's size and extent is large.
A. A and R are correct and R explains A.
B. A and R are correct but R does not explain A.
C. A is true but R is incorrect.
D. Both A and R is correct.

607. The Indian institute of science is located at:
A. Chennai B. Kolkata
C. Bengluru D. Mumbai

608. India's biggest superthermal power station is located in:
A. Barh near Patna
B. Talcher-Kiniha in Orissa
C. Koradi near Nagpur
D. Bathinda in Punjab

609. Which of the following is not correctly matched?
A. Glass Industry – Firozabad
B. Crackers Industry – Shivakasi
C. Silk Industry – Karnataka
D. Cement Industry – Patiala

610. The total area in India under water logging (type) situation is:
A. 6 million hectares
B. 2 million hectares
C. 30 million hectares
D. 182 million hectares

611. The largest Industry in India is:
A. Steel industry
B. Cement industry
C. Textiles industry
D. Automobile industry

612. The recently discovered field with oil potential in Krishna-Godavari Basin is called:
A. Golcunda Block
B. Rawa off shore Block
C. Bombay High
D. Telengana Block

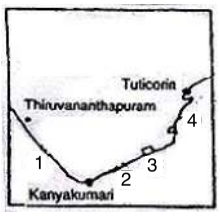
613. The minimum Land area recommended for forest cover to maintain proper ecological balance in India is:
A. 57% B. 43%
C. 33% D. 23%

614. Most of the Indian coal is extracted from:
A. Upper Gondwana rocks
B. Middle Gondwana rocks
C. Lower Gondwana rocks
D. Tertiary rocks

615. Which one of the following statements is not true of the Konkan railway?
A. The total length is about 760 km
B. It runs through the states of Karnataka, Goa, Maharashtra, Kerala
C. It is the only rail route that cuts across the western ghats.
D. The Konkan railway construction company which came into being raised money through public issues.

616. The first marine sanctuary in India, havin within its bounds coral reefs, mollusca, dolphins, tortoises and various kinds of sea birds has been established in:
A. Lakshadweep
B. Gulf of Kachch
C. Chilka Lake
D. Sunderbans

617. The given figure shows a portion of Southern India the proposed site (Koodankulam) for the construction of two 100 MW nuclear power plants has been labelled in the map as:



A. 1 B. 2
C. 3 D. 4

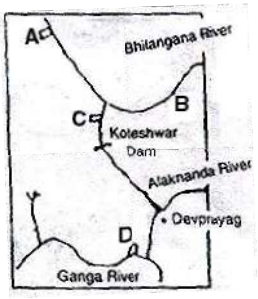
618. Match List I with List II and select the correct answer using the code given below the lists:

List I	***List II***
Resprts	***States***
(a) Chakrata	1. Asom
(b) Haflong	2. West Bengal
(c) Kalimpong	3. Uttarakhand
(d) Kufri	4. Himachal Pradesh

Codes:

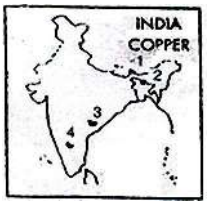
	(a)	*(b)*	*(c)*	*(d)*
A.	1	3	2	4
B.	3	1	4	2
C.	3	1	2	4
D.	1	3	4	2

619. In the given figure, the site of the Tehri Dam has been labelled as:



A. A B. B
C. C D. D

620. In which of the following areas in the given map, there was a recent discovery of copper deposits by the atomic minerals division of the Department of Atomic energy.



A. 1 B. 2
C. 3 D. 4

621. Match List I with List II and select the correct answer using the code given below the lists:

List I ***Industries***	***List II*** ***Industrial Centre***
(a) Pearl fishing	1. Pune
(b) Automobiles	2. Tuti Corin
(c) Ship building	3. Pinjore
(d) Enginneering goods	4. Marmagao

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	2	1	4	3
B.	2	1	3	4
C.	1	2	4	3
D.	1	2	3	4

622. Which of the following statements is correct?

A. Kacchativu and Tin Bigha were the territories acquired by the India republic from the french.

B. Kacchativu and Tin Bigha are the territories handed over to Sri Lankan and Bangladeshi sovereignity respectively by the Government of India

C. Kacchativu and Tin Bigha are those areas that were annexed by the Chinese in the 1962 sino Indian War.

D. Kacchativu and Tin Bigha are those enclaves which were transferred to India by lease arrangements with Srilanka and Pakistan respectively.

623. Almatti dam is being constructed between which of the following pairs of state?

A. Andhra Pradesh and Karnataka
B. Karnataka and Tamil Nadu
C. Tamil Nadu and Andhra Pradesh
D. Madhya Pradesh and Andhra Pradesh

624. Amarnath is situated at a height of about:

A. 6100 metres
B. 5320 metres
C. 4785 metres
D. 4054 metres

625. The maximum stretch of India between North to South is about

A. 3500 km B. 3200 km
C. 3000 km D. 2800 km

626. Orissa has longest border with:

A. Andhra Pradesh
B. Chhattisgarh
C. Jharkhand
D. U.P.

627. In India most of the rainfall occurs during:
A. south west monsoon season
B. north east monsoon
C. summer season
D. winter season

628. Which Indian states share the tungbhadra multipurpose project?
A. Andhra Pradesh and Karnataka
B. Karnataka and M.P.
C. Odisha and Jharkhand
D. Tamil Nadu and Karnataka

629. Indian Standard time is the local time of $82\frac{1^\circ}{2}$ E which passes through.
A. Kolkata B. Delhi
C. Guntur D. Allahabad

630. Which one of the following types of forests is found in Sahyadris?
A. Tropical Moist Deciduous Forest
B. Topical Dry Deciduous Forest
C. Tidal Forest
D. Wet Temperate Forest

631. Country's longest tunnel is .....
A. Pir Panjal Railway Tunnel
B. Kurbude
C. Nathuwadi
D. Tike

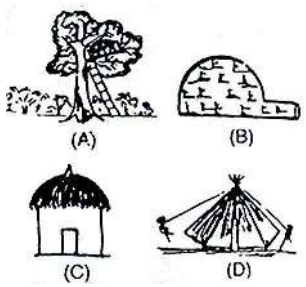
632. Which one of the following strongly treatens bio diversity?
A. Fragile ecosystems such as mangroves and wetlands.
B. In accessible habitats in the Himalayas.
C. Destruction of natural habitats and vegetation and shifting cultivation.
D. Creation of biosphere reserves.

633. Rajasthan receives very little rain because:
A. it is too hot
B. there is no water available and thus the winds remain dry
C. the monsoons fail to reach this area
D. the winds do not come across any barrier to cause the necessary uplift to cool the winds

634. How many notified Biosphere Reserve in India?
A. 18 B. 20
C. 22 D. 26

635. The solar eclipse achieves totaling only in limited geographical regions between:
A. The size of shadow of the moon on the earth is small as ompared to the cross section of the earth
B. The earth is not smooth flat surface, but has elevations and depressions
C. The trajectories of the earth around the sun and the moon around the earth are not perfect cycles
D. Sun rays can reach most of the peripheral regions of shadow of the moon due to atmospheric retraction

636. Among the tour houses types shown below, which one represents the house type of the pygmies?



A. (A) B. (B)
C. (C) D. (D)

637. Sucrose content in sugarcane decreases:
A. If high rainfall occurs during the period of growth of the plant
B. If frost occurs during the period of ripening
C. If there is fluctuation in temperature during the period of growth of the plant
D. If there is high temperature during the time of ripening

638. **Assertion (A):** The frequency of floods in north indian plains has increased during the last couple of decades.
Reason (R): There has been reducing in the depth of river valleys due to deposition of silt.
Codes:
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

639. Match List I with List II and select the correct answer using the code given below the lists:

List I : Institutes	***List II Location***
(a) Central Institute of Higher Tibetan Studies.	1. Hyderabad
(b) Indira Gandhi Institute of Development Research	2. Mumabi
(c) National Institute of Mental Health and Neuro Sciences	3. Bengluru
(d) Central Institute of English and Foreign Languages	4. Dharmshala
	5. Varanasi

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	5	3	4	1
B.	5	2	3	1
C.	3	2	4	5
D.	4	5	1	2

640. Consider the following pairs:

Famous place		***Region***
1. Bodhgaya	:	Baghelkhand
2. Khajuraho	:	Bundelkhand
3. Shirdi	:	Vidarbha
4. Nasik (Nashik)	:	Malwa
5. Tirupati	:	Rayalaseema

Which of the pairs given above are correctly matched?
A. 1, 2 and 4
B. 2, 3, 4 and 5
C. 2 and 5 only
D. 1, 3, 4 and 5

641. Which one of the following statements is not true?
A. Ghaggar's water is utilised in the Indira Gandhi Canal.
B. Narmada rises from Amarkantak region.
C. Nizam Sagar is situated on the manjra river
D. Penganga is a tributory of the Godavari

642. Kistwar town is situated on the bank of:
A. Ravi
B. Chenab
C. Jhelum
D. Satluj

643. Which one of the following states of India is the least densely populated?
A. Chhattisgarh
B. Jharkhand
C. Sikkim
D. Arunachal Pradesh

644. **Assertion (A):** The snow line in the western. Himalayas is lower than that in the eastern Himalayas.
Reason (R): Western Himalayas are at a higher Latitude.
Codes:
A. Both A and R are true and R is the correct explanation of A.
B. Both A and R are true but R is not the correct explanation of A.
C. A is true but R is false.
D. A is false but R is true.

645. **Assertion (A):** About seventy five percent of the working population of the Aravalli mountain region is engaged in agriculture.

Reason (R): The greater parts of Aravallis receive scantly rainfall.

Codes:

A. Both A and R are true and R is the correct explanation of A.
B. Both A and R are true but R is not the correct explanation of A.
C. A is true but R is false.
D. A is false but R is true.

646. Consider the following seaports:

1. Chennai
2. Machilipatnam
3. Nagapattinam
4. Tuticorin

The correct sequence of these parts as one moves from north to south is

A. 1, 2, 4, 3 B. 2, 1, 3, 4
C. 1, 3, 2, 4 D. 2, 1, 4, 3

647. The axis of rotation of the earth is tilted by 23.5° to the plane of revolution around the sun the latitude of Mumabi is less than 23.5° whereas the laititude of Delhi is more than 23.5° which one of the following statements is this regard is correct?

A. The sun can come overhead at both these places
B. The sun will never come overhead at either of these places
C. At Mumbai the sun can come over head, but it will never do so at Delhi
D. At Delhi sun can come overhead but it will never do so at Mumbai

648. Match List I with List II and select the correct answer using the code given below the lists:

List I	***List II***
(a) Pir Panjal	1. Arunachal Pradesh
(b) Dhauladhar	2. Uttarakhand
(c) Nag Tibba	3. Jammu & Kashmir
(d) Mishimi Hills	4. Himachal Pradesh

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	4	3	1	2
B.	3	4	2	1
C.	3	4	1	2
D.	4	3	2	1

649. Indian Standard Meridian passes through the States of U.P., M.P., Chhatisgarh:

A. Orissa, A.P. and Telangana
B. A.P. and Karnataka
C. A.P. and Tamil Nadu
D. Karnataka and Tamil Nadu

650. **Assertion (A):** Urbanisation follows industrialisation.

Reason (R): In developing countries, urbanisation is a movement in itself.

Codes:

A. Both A and R are true and R is the correct explanation of A.
B. Both A and R are true but R is not the correct explanation of A.
C. A is true but R is false.
D. A is false but R is true.

651. The Singareni coal fields is located in the river basin of:

A. Godavari
B. Damodar
C. Mahanadi
D. Narmada

652. While India's human population is growing at an astounding pace, the bird population is shrinking fastly mainly because:

1. There has been an abnormal increase in the number of hunters.
2. Bio-pesticider and organic manure are being used on a large scale.
3. There has been a large scale reduction in the habitats of the birds.
4. There has been a large scale use of pesticides chemical fertilisers and mosquito repellents.

Select your answer correctly using the code given below.

Codes:

A. 1 and 2 are correct
B. 2 and 3 are correct
C. 3 and 4 are correct
D. 1 and 4 are correct

653. Which one of the following is an important tribe of the Dhauladhar range?

A. A bor B. Gaddi
C. Lepcha D. Tharu

654. Match List I with List II and select the correct answer using the code given below the lists:

List I Forest	***List II Region***
(a) Tropical moist deciduous	1. Arunachal Pradesh
(b) Tropical dry deciduous	2. Sahyadris
(c) Alpine	3. Middle ganga plain
(d) Tropical wet evergreen	4. Tarai

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	4	3	1	2
B.	4	2	1	3
C.	1	3	2	4
D.	3	1	4	2

655. Match List I with List II and select the correct answer using the code given below the lists:

List I (Industry)	***List II (Production Centre)***
(a) Jute Textile	1. Bhadohi
(b) Silk textile	2. Ludhiana
(c) Woollen Hosiery	3. Bengluru
(d) Woollen Carpet	4. Titagarh

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	3	4	2	1
B.	4	3	2	1
C.	1	3	4	2
D.	4	1	3	2

656. Which one of the following pairs of cities has recently been connected by a six Lan express way?

A. Ahmedabad and Vadodra
B. Dhaka and Chittagong
C. Islamabad and Lahore
D. Mumabi and Pune

657. Lakshadweep islands are the product of:

A. Volcanic activity
B. Wave action
C. Sea floor expansion
D. Reef formation

658. The success of Green revolution depends on the availability of:

A. High Yielding Variety (HYV) of seeds.
B. Adequate irrigation facilities
C. Chemical fertilizers and pesticides
D. All of these

659. Kaziranga is known for:

A. Project tiger
B. Two horned Rhino
C. One horned Rhino
D. Operation flood

660. Consider the following statements regarding environmental issue of India.

1. Gulf of manner is one of the biosphere reserves.
2. The Ganga action plan phase II has been merged with the national river conservation plan.
3. The National Museum of Natural History at New Delhi imparts non formal education in environment and conservation.
4. Environmental information system (ENVIS) acts as a decentralised information net work for environmetnal information.

Which of these statements are correct?

A. 1, 2 and 4 B. 1, 2, 3 and 4
C. 2 and 3 D. 1, 3 and 4

661. **Assertion (A):** The Koyna region of Maharashtra is likely to become more earthquake prone in near futrue.

Reason (R): The Koyna dam is located on an old fault plane which may get activated more frequently with changes in water level in Koyna reservoir.
Select the correct answer using the code given below.
Codes:
A. Both A and R are true and R is the correct explanation of A.
B. Both A and R are true but R is not the correct explanation of A.
C. A is true but R is false.
D. A is false but R is true.

662. The longitude determining Indian Standard Time passes through.
A. Ranchi B. Delhi
C. Chennai D. Kolkata

663. Which place receives the maximum solar energy in December?
A. Kolkata B. Delhi
C. Amritsar D. Chennai

664. Occasional winter rianfall in the northern India occurs due to the cyclones from.
A. Bay of Bengal
B. Pacific Ocean
C. Arabian Sea
D. Mediterranean Sea

665. Khetri is famous for the production of:
A. Tin B. Gold
C. Copper D. Mineral oil

666. In India, which one of the following states has the largest inland saline wetland?
A. Gujarat
B. Haryana
C. Madhya Pradesh
D. Rajasthan

667. Which country of the world is the largest exporter of cardamom?
A. India B. China
C. Brazil D. Srilanka

668. Maximum iron ore from Bailadila mine is exported to:
A. Australia B. Malayasia
C. Japan D. New Zealand

669. In which one of the following places is the Shompen tribe found?
A. Nilgiri Hills B. Nicobar Islands
C. Spiti Valley D. Lakshadweep

670. The Brahmaputra is an example of:
A. Subsequent river
B. Obsequent river
C. Antecedent river
D. Super imposed river

671. Which one of the following soils found in India has been derived from materials deposited by fissure eruptions in cretaceous period?
A. Laterite soil B. Alkaline soil
C. Black soil D. Sandy soil

672. Which one of the following is not correctly matched?
A. Hyderabad — Hussain Sagar
B. Srinagar — Dal Lake
C. Sagar — Ravindra Sagar
D. Udaipur — Pichhola Lake

673. The weather map of India is drawn on:
A. Bonne's projection
B. Polyconic projection
C. Mercator's projection
D. International projection

674. The Malwa region is mostly inhabited by:
A. Compact villagers
B. Semi compact villagers
C. Fragmented villagers
D. Sprinkled villagers

675. Most of the precipitation in India is ..... in nature.
A. cyclonic B. convectional
C. orogaphic D. frontal

676. Patlands are found in:
A. Chhotanagpur region
B. Dand Karanya
C. Vidarbha Plains
D. Vindhyan Uplands

677. Among the following which one is not a cause of soil-erosion?
A. Drift B. Deforestation
C. Drainage system D. Excess cutting

678. Consider the following statements:
1. Salt water crocodile is found in the Andaman and Nicobar Islands.
2. Shrew and tapir are found in the Western Ghats of the malabar region.

Which of the statements given above is/ are correct?
A. 1 only B. 2 only
C. Both 1 and 2 D. Neither 1 nor 2

679. The first three largest producers of sugar in India are:
A. Bihar, U.P, Maharashtra
B. U.P., Maharashtra and Andhra Pradesh
C. U.P., Maharashtra and Tamil Nadu
D. Bihar, U.P., Andhra Pradesh

680. The population of Uttar Pradesh out excels the population of which one of the following countries?
A. Brazil B. Indonesia
C. Japan D. U.S.A

681. Tochi, Gilgit and Hunza are tributaries of
A. Ganga B. Brahmaputra
C. Indus D. Yamuna

682. The Cauvery flows through the states of:
A. Andhra Pradesh, Karnataka and Tamil Nadu
B. Kerala, Karnataka and Tamil Nadu
C. Maharashtra, Karnataka and Tamil Nadu
D. Maharashtra, Andhra Pradesh and Tamil Nadu

683. **Assertion (A):** Western Ghats are not true mountains.
Reason (R): The Western Ghats represent the precipitous western edge of a plateau uplifted in the present form.
Codes:
A. Both A and R are true and R is the correct explanation of A.
B. Both A and R are true but R is not the correct explanation of A.
C. A is true but R is false.
D. A is false but R is true.

684. Which of the following geological systems is considered the most ancient in India?
A. Cuddapah System
B. Dharwar System
C. Gondwana System
D. Vindhyan System

685. Which of the following statements are correctly regarding the Khadar soils? Select your answer from the code given below:
1. They occupy flood plains of the rivers
2. They are rich in plant nutrients.
3. They have sizeable tracts of usar.

Code:
A. Only 1 is correct
B. Only 1 and 2 are correct
C. Only 1 and 3 are correct
D. All are correct

686. Which is located in lesser Himalayas?
A. Burzil pass B. Baramula pass
C. Zozila pass D. Shipkila

687. The oil refinery at Mathura has locational advantage of:
A. Raw material B. Market
C. Power supply D. Water supply

688. The headquarters of the S.W. Railway zone is located at:
A. Thiruananthapuram
B. Bengluru
C. Kochi
D. Coimbatore

689. The river which marks the international boundary between India and Nepal is:
A. Gandak B. Kosi
C. Kali D. Tista

690. Read the following statements and select the correct answer from the code given below:
Assertion (A): Yamuna becomes a dead river between Delhi and Agra during most of the year.
Reason (R): Yamuna is a non perennial river.
Codes:
A. A is true but R is false
B. A is false but R is true

C. Both A and R are true and R is the correct explanation of A
D. Both A and R are true but R is not the correct explanation of A

691. Read the following statements and select the correct answer from the code given below:
Assertion (A): The river Ganga is not navigable.
Reason (R): There are great fluctuations in the river regime.
Codes:
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

692. Where can one expect dry winters in India?
A. Tamil Nadu
B. Punjab and Haryana Plains
C. Jammu & Kashmir
D. Bengal Plains

693. Which one of the following is correctly matched?
A. Manipur–Shillong
B. Meghalaya–Kohima
C. Arunachal–Itanagar
D. Nagaland–Imphal

694. Which one of the following rivers of India does not make the delta?
A. Ganga B. Tapi
C. Godavari D. Mahanadi

695. Tamil Nadu coast of India receives rainfall in winter through
A. North-east monsoon
B. South-east monsoon
C. North-west monsoon
D. South-west monsoon

696. Garo-Khasi-Jaintia hills are part of the
A. Deccan Plateau
B. Himalaya Mountains
C. Hill chains between India and Myanmar
D. All the above

697. Based on the intensity of irrigation arrange the following states in their order of rising percentage of net irrigated area to net cropped area:
1. Punjab 2. Uttar Pradesh
3. Tamil Nadu 4. Haryana
Codes:

A. 1	4	2	3
B. 4	3	2	1
C. 3	1	2	4
D. 2	3	4	1

698. The largest tea producing group of states in India is:
A. Asom, Bihar, Uttar Pradesh
B. Maharashtra, Karnataka, Kerala
C. Asom, West Bengal, Tamil Nadu
D. Asom, West Bengal, Uttar Pradesh

699. After Independence new industrial towns were developed in India to:
1. Utilize the raw materials
2. Decentralize heavy industries
3. Check the overgrowth of migration of population
4. Develop backward area
Codes:
A. 1 and 3 are correct
B. 1, 2 and 4 are correct
C. 1, 3 and 4 are correct
D. 2 and 3 are correct

700. Consider the following statement:
Assertion (A): Ahmedabad is a great centre of sick cotton textile industry.
Reason (R): Cotton required by the industry is grown on large scale in the black cotton soil region around it.
Codes:
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

701. The coal producing geological system in India is:
A. Dharwar B. Vindhyan
C. Cuddapah D. Gondwana

702. The main boundary fault is found in:
A. the Deccan Plateau
B. the Western Ghats
C. the Eastern Ghats
D. the Himalayas

703. The third stage in the demographic transition is characterised by:
A. high birth rate and high death rate
B. high birth rate and rapidly declining death rate
C. low death rate and rapidly declining birth rate
D. low birth rate and low death rate

704. As per India's National Population Policy, 2000, by which one of the following years is it our long-term objective to achieve population stabilisation?
A. 2025 B. 2035
C. 2045 D. 2055

705. Arrange the following states in order of their increasing density of population.
1. Asom 2. Maharashtra
3. Orissa 4. Tamil Nadu

Codes:

A.	1	2	3	4
B.	1	4	3	2
C.	3	2	1	4
D.	2	4	3	1

706. Which of the following is not a correct statement?
A. Haldia is in West Bengal
B. Paradeep is in Asom
C. Kandla is in Gujarat
D. Marmagao is in Goa

707. Diamond mines are located in:
A. Uttar Pradesh
B. Karnataka
C. Madhya Pradesh
D. Gujarat

708. The Matatilla multipurpose project is situated on:
A. Sone river B. Ken river
C. Betwa river D. Yamuna river

709. The mangrove vegetation in India is found in:
A. Gangetic delta region
B. East Himalayan region
C. Western Ghats region
D. Eastern Ghats region

710. Which of the following has evergreen forests?
A. Chhotanagpur Plateau
B. North-eastern States
C. Eastern slopes of eastern ghats
D. Eastern slopes of Sahyadris

711. The greatest length of canals is found in:
A. Andhra Pradesh B. Haryana
C. Punjab D. Uttar Pradesh

712. Which one of the following sites has been selected for setting up a steel plant in the private sector?
A. Dabhol B. Gopalpur
C. Kochin D. Paradeep

713. Match List I with List II and select the correct answer using the code given below the lists:

List I	***List II***
(a) Block	1. Himalaya
(b) Fold	2. Sahyadri
(c) Relict	3. Rajmahal Hills
(d) Volcanic	4. Nilgiris

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	2	4	1	3
B.	4	3	2	1
C.	2	1	4	3
D.	4	2	3	1

714. The habitat of Toddas is:
A. plain
B. hilly
C. undulating plateau
D. high mountain valley

715. The annual amount of rainfall decreases from east to west in the Ganga Plain because:
A. relief increases moderately
B. moisture content of air decreases gradually
C. temperature increases
D. western disturbances have high frequency in the west

716. Which of the following statement is not correct?
A. Jute is grown in Asom
B. Cotton is wide spread in Maharashtra
C. Gujarat is the main area of ground-nut
D. Madhya Pradesh has the maximum cultivated area under maize

717. Which one of the following river passes through a Gorge?
A. Godavari B. Krishna
C. Tapti D. Mahanadi

718. The water received through annual precipitation in India, on an average amounts to:
A. 200 mhm. B. 300 mhm.
C. 400 mhm. D. 500 mhm.

719. Acquaculture in coastal states of India poses a threat to the environment because
A. prawns emanate foul smell
B. prawn feed used is filthy
C. it entails mixture of brackish with fresh water
D. prawns may engender epidemics

720. Doon Valley is able to grow rice because:
A. It has warm summers and snowmelt waters for irrigation
B. People in the valley are rice eaters
C. Other crops cannot be grown
D. There is a huge export demand

721. Banihal pass is in:
A. Punjab Himalaya
B. Kumaon Himalaya
C. Kashmir Himalaya
D. Asom Himalaya

722. A Centre of mica mining in India is located at:
A. Khetri
B. Kodarma
C. Kalahandi
D. Guru Mahisani

723. Match List-I with List-II and select the correct answer using the code given below the lists:

List I (Mining Areas)	***List II (Minerals)***
(a) Badampahar	1. Bauxite
(b) Bhandara	2. Copper
(c) Musabani	3. Iron-ore
(d) Lohardaga	4. Manganese

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	3	1	2	4
B.	3	4	2	1
C.	1	4	3	2
D.	2	3	4	1

724. Which of the following soils occupies the largest area in peninsular India:
A. Black soil
B. Laterite soil
C. Red soil
D. Alluvial soil

725. Which one of the following notations has been used by G.T. Trewartha for the climate of Ganga plain?
A. CA'W B. Caw
C. CB'W D. Cwg

726. The Hoogly industrial belt is known for its:
A. jute, iron, steel and heavy engineering industries
B. cement, leather, woollen textile and heavy engineering industries
C. aluminium, iron and steel, petrol refining and textile industries
D. jute, cotton textile, chemicals and light engineering industries

727. The main boundary fault in the Himalaya separates.
A. Great Himalaya from middle Himalaya
B. Middle Himalaya from Siwalik
C. Siwalik from Bhabar
D. Tibet from Great Himalaya

728. Which one of the following is not correctly matched?
A. Naomundi — Singhbhum
B. Guru Mahisani — Keonjhar
C. Kemmangundi — Bhadravati
D. Rajahara — Chandrapur

729. The most important deposits of gypsum in India are found in:
A. Andhra Pradesh B. Gujarat
C. Rajasthan D. Tamil Nadu

730. Which one of the following areas is characterized by dispersed rural settlements?
A. Mirzapur Plateau
B. Bundelkhand Highland
C. Ganga-Yamuna Doab
D. Lower Ganga-Ghagra Doab

731. Which one of the following is shown by shading on the map given below?



A. 40 to 120 cm rainfall zone
B. Erosion affected area
C. Drought prone area
D. Area of regur soil

732. Which one of the following states has the largest network of national highway?
A. Andhra Pradesh B. Maharashtra
C. Madhya Pradesh D. Uttar Pradesh

733. In terms of value India is the largest exporter of:
A. Textile
B. Germs and jewellery
C. Engineering goods
D. Agricultural products

734. Luni River is in the:
A. Punjab
B. Rajasthan
C. Gujarat
D. Himachal Pradesh

735. Pat lands are found in:
A. Dandakarnya
B. Chhotanagpur
C. Vidarbha plains
D. Vindhyan uplands

736. Which of the follwing districts of U.P. has been the pioneer in intensive area?
A. Aligarh B. Ballia
C. Banda D. Lucknow

737. Bansagar project is located on the river.
A. Rihand B. Sone
C. Kanhar D. Chambal

738. Which one of the following cities of Uttar Pradesh is not located beside the G.T. Road?
A. Allahabad
B. Kanpur
C. Sikohabad
D. Lucknow

739. In terms of industrial development, the most backward region of Uttar Pradesh is:
A. Bundelkhand
B. Central Uttar Pradesh
C. Rohil Khand
D. Purvanchal

740. Winter rain along the coast of Tamil Nadu is caused by:
A. Retreating monsoon
B. Pre monsoon or winds
C. Western disturbances
D. Mango showers

741. Uttar Pradesh is the leading producer of:
A. wheat, sugarcane and rice
B. wheat, potato and groundnut
C. wheat, colton and potato
D. wheat, sugarcane and potato

742. The most serious objection to the construction of Tehridam is raised on the ground that:
A. its cost benefit ratio is high
B. it will displace large number of people
C. it will inundate vast tracts of forest
D. it is vulnerable to earthquake

743. Which of the following pairs is correctly matched ?
Select the correct answer from the code given below:
1. Vedda — Food gathering
2. Kukis — Shifting cultivation

3. Bhotias — Transhumance
4. Todas — Sedentary cultivation

Codes:

A. 1, 2, 3 B. 1, 3, 4
C. 2, 3, 4 D. 1, 2, 3, 4

744. The most suitable map projection for the map of Uttar Pradesh is:
A. Bonne's projection
B. International projection
C. Interrupted sinusoidal projection
D. Mollweide projection

745. The weather map of India does not show:
A. Cloudiness
B. Wind direction
C. Isobars
D. Isotherms

746. Which one of the following dams in the Himalayas lies in Pakistan?
A. Bhakra dam B. Mangla dam
C. Kalagarh dam D. Salal dam

747. Consider the following statements:
Assertion (A): The main habitat of the Mikir tribe is the mikir hills of Asom.
Reason (R): The principal occupation of the mikirs is hunting.
Codes:
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

748. The incidence of poverty in rural India is, because:
A. the people are engaged in agriculture.
B. the people are not hard working.
C. of rural unemployment and under employment
D. of lack of the means of transportation.

749. Winter rains in Uttar Pradesh are associated with:
A. retreating monsoon
B. thunder storms
C. temperatecy clones
D. local convection

750. Which of the following is not a major problem associated with canal irrigation in India?
A. Water logging
B. Decrease in area under pulses and oil seeds
C. Increase in area under alkaline and saline soils
D. Fragmentation of land holdings

751. The southern limit of India (main land) is:
A. 6°4' North latitude
B. 7°4' North latitude
C. 8°4' North latitude
D. 6°8' North latitude

752. The name of the pass located in lesser Himalayas is:
A. Burzil B. Baramula
C. Zozila D. Shipkila

753. Which of the following factors is most significant in the localization of HINAL Co. at Renukut?
A. Cheap labour
B. Easy access to raw materials
C. Efficient transportation
D. Cheap power

754. In the context of Himalayan orogency river Gomti is:
A. obsequent
B. exhumed stream
C. antecedent stream
D. consequent stream

755. Had there been Equator in place of tropic of cancer in India, the changed caused in the climate would be?
A. high temperature and low rainfall
B. low temperature and high rainfall
C. high temperature and high rainfall
D. low temperature and low rainfall

756. Which one of the following denotes the southern most place in India?
A. Indira point B. Kanyakumari
C. Nagarcoil D. Rameshwaram

757. Trans humance is practiced by the:
A. Bhils B. Bhotias
C. Kukis D. Nagas

758. Which one of the following is not a sea port?
A. Okhla B. Trichur
C. Quilon D. Nagarcoil

759. Which one of the following is not correctly matched?
A. Chandraprabha Sanctuary — Uttar Pradesh
B. Bandipur sanctuary — Karnataka
C. Kaziranga — Assam
D. Kanha National Park — Maharashtra

760. Pat lands are the main source of:
A. Mica B. Buxatie
C. Iron-ore D. Coal

761. Pearl fishing is done in the coast of:
A. Tamil Nadu
B. Orissa
C. Kerala
D. Andhra Pradesh

762. Which one of the following metropolises has the distinction of the best corporate health care system in the country?
A. Chennai B. Kolkata
C. Delhi D. Mumbai

763. Sand bluff, locally called 'Dhus' is a typical topographic feature in:
A. Thar Desert
B. Middle Ganga plain
C. Malabar Coast
D. Mahanadi delta

764. In which one of the following states and union administered territories, uninhabited villages are found?
A. Chandigarh
B. Arunanchal Pradesh
C. Dadra-Nagar-Haveli
D. Himachal Pradesh

765. Which one of the following rock series belongs to the cuddapah system of rocks?
A. Champaner
B. Papa ghani cheyar range
C. Semri
D. Sausar

766. Consider the following statements and select the correct answer from the code given below:
The climate of the Brahmaputra valley is characterised by the following conditions:
1. Orography
2. Alternating seasonal pressure oscillations
3. Mountain and valley winds
4. Heat waves.

Codes:
A. 1 and 2 are correct
B. 2 and 3 are correct
C. 1, 2 and 3 are correct
D. 1, 3 and 4 are correct

767. The most mineralized rock system of India is:
A. Cuddadpah system.
B. Dharwar system.
C. Gondwana system.
D. Vindhyan system.

768. Who of the following proposed planning regions of India?
A. S.C. Chatterji
B. S. M. Ali
C. V. Nath
D. George Kuriyan

769. Which of the following is not correctly matched?
A. Pir Panjal — lesser Himalaya
B. K_2 — Karakoram
C. Karewas — Valley of Kashmir
D. Potwar — Kumaon Himalaya

770. Consider the following statements about Gondwana rocks of India and select the correct answer from the code given below:
1. Gondwana rocks were formed in the post Vindhyan period.
2. These are the oldest sedimentary rocks in the country.
3. These are highly metalliferous rocks.
4. These consist of large deposit of coal.

Codes:
A. 1 and 4 are correct
B. 1 and 3 are correct
C. 2 and 4 are correct
D. 3 and 4 are correct

771. In the development of hydro-electricity the pioneering state was:
A. Karnataka
B. Himachal Pradesh
C. Tamil Nadu
D. Uttar Pradesh

772. The correct sequence in decreasing order in terms of total production of the given non-ferrous metal in India is:
A. Lead, Zinc, Copper, Aluminium
B. Zinc, Lead, Aluminium, Copper
C. Aluminium, Zinc, Copper, Lead
D. Aluminium, Copper, Zinc, Lead

773. Consider the following statements about Konkan Railway and select the correct answer from the code given below:
1. It traverses across the most-rugged and hilly-terrain of the west coast facing the Arabian Sea.
2. It has been financed by the World Bank.
3. The total length of the broad guage single line railway is 760 km.
4. It passes through the states of Maharashtra, Goa, Karnataka and Kerala.

Codes:
A. 1 and 4 are correct
B. 1 and 3 are correct
C. 2 and 4 are correct
D. 3 and 4 are correct

774. The dominant type of irrigation in peninsular India is:
A. Canal
B. Tank
C. Well
D. Sprinkler

775. Match List I with List II and select the correct answer using the code given below the lists

List I (Minerals)	***List II (Important Mines)***
(a) Iron-ore	1. Zawar
(b) Mica	2. Bailadil
(c) Silver	3. Babupali
(d) Graphite	4. Kodarma

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	1	2	3	4
B.	4	3	2	1
C.	2	4	1	3
D.	1	3	2	4

776. The major forest product in India is:
A. Timber B. Fuel wood
C. Cane products D. Resins

777. Consider the following statements:
Assertion (A): No census towns are found in Andaman and Nicobar Islands.
Reason (R): There are no large scale industries.
Select the correct answer using the code given below.
Codes:
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

778. Which of the following is a feature of 'Syntaxial Bend'?
A. Himalayas B. Aravallis
C. Satpuras D. Vindhyas

779. Consider the following statements:
Andhra Pradesh is one of the leading producers of rice because
1. It has fertile alluvial soil in the coastal plain
2. It receives about 125 cm of rainfall per annum in the coastal tract
3. It has a lot of tank irrigation in the coastal plain

Of these statements:
A. 1, 2 and 3 are correct
B. 1 and 2 are correct
C. 2 and 3 are correct
D. 1 and 3 are correct

780. The Kulu Valley is situated between the mountain in ranges of:
A. Dhauladhar and Pir Panjal
B. Ranjoti and Nag Tibba
C. Ladakh and Pirpanjal
D. Middle Himalayas and Siwalik

781. The highest percentage of decadal growth of population during the period 2001-2011 was registered by:
A. West Bengal B. Uttar Pradesh
C. Bihar D. Meghalaya

782. Which of the following is not correctly matched?
A. Kanyakumari — Tamil Nadu
B. Ooty — Karnataka
C. Manas — Assam
D. Simlipal — Orissa

783. Western Ghats are:
A. Mountains
B. Plateaus
C. Escarpment of the Plateaus
D. Hills

784. Which of the following factors is more important for the location of the steel plants at Bokaro?
1. Nearness to iron ore deposits
2. Nearness to coal deposits
3. Nearness to both coal and iron ore deposits
4. Nearness to the port city of Kolkata
A. 1 and 2 B. 1 and 3
C. 2 and 4 D. 1, 2, 3 and 4

785. Match List I with List II and select the correct answer using the code given below the lists:

List I	***List II***
(a) Bengaluru	1. Fertilizer
(b) Chittranjan	2. Electric Rail Engine
(c) Kapurthala	3. Air Craft
(d) Sindri	4. Railway Coaches

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	3	1	2	4
B.	4	2	3	1
C.	3	2	4	1
D.	1	3	4	2

786. India recorded the highest growth rate of population in the decades:
A. 1951-61 B. 1961-71
C. 1971-81 D. 1981-91

787. Which one of the following is the youngest mountain chain?
A. Annamalai B. Aravalli
C. Siwalik D. Vindhayan

788. Which of the following favours the onset of West Monsoon?
A. El-Nino
B. Subtropical Westerly jet
C. Polar front jet
D. Tropical easterly jet

789. Which of the following names is given to the oldest sedimentary rocks found in India?
A. Cuddapah B. Dharwar
C. Gondwana D. Vindhyan

790. Higher literacy in Kerala state is accounted by:
A. Sound economy
B. Absence of backward communities
C. Well-developed social infrastructure
D. Highly urbanised society

791. In India the highest infant mortality rate is associated with the state of:
A. Bihar
B. Arunachal Pradesh
C. Madhya Pradesh
D. Orissa

792. The union territory of India having enclaves in three states is:
A. Dadra and Nagar Haveli
B. Daman and Diu
C. Lakshadweep
D. Pondichery

793. Which of the following region is characterised by 'As' climate of Koppen?
A. Asom Himalaya
B. Kerala coast
C. Rajasthan desert
D. Tamil Nadu coast

794. Which of the following items have mostly dominated the recent export trade of India on the basis of value?
A. Machineries, textiles, gems, leather goods

B. Tea, spices, jute, goods, iron-ore
C. Manganese coal, tobacco, iron & steel
D. Tea, sugar, spices, engineering goods

795. Western Ghats are:
A. block mountain
B. folded mountain
C. relict mountain
D. volcanic mountain

796. Which of the following regions exhibit identical drainage pattern as that of the Amar Kantak hills?
A. Satmala hills B. Mikir hills
C. Mizo hills D. Satpura hills

797. Which one of the following rivers has the largest basin area in India?
A. Brahmaputra B. Godavari
C. Krishna D. Mahanadi

798. Which of the following states has the largest area under maize in India?
A. Bihar B. Madhya Pradesh
C. Rajasthan D. Uttar Pradesh

799. **Assertion (A):** The coal bearing Gondwana rocks in India are found in river valleys.
Reason (R): There has been sag faulting in the Gondwana rock area.
Select the correct answer using the code given below.
Codes:
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

800. **Assertion (A):** Green revolution has been spectacularly successful in canal irrigated area.
Reason (R): Canal irrigation is the cheapest and safest source of irrigation.
Select the asnwer from the codes:
Codes:
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

801. Which one of the following shipyards builds wroships for the Indian Navy?
A. Cochin B. Garden Reach
C. Hindustan D. Mazgaon

802. Which one of the following dams is not meant for irrigation?
A. Bhavani Sagar
B. Sivasamudram
C. Krishnaraja Sagar
D. Bhakra-Nangal

803. Which one of the following physiographic units has been created by both exogenic and endogenic forces?
A. The Peninsular Plateau
B. The Thar Desent
C. The Indo-Gangetic Plain
D. The Himalayas

804. Which mountain system in India is the oldest one?
A. Himalaya B. Vindhyan
C. Aravalli D. Satpura

805. Which one of the following is associated with Indian Agriculture?
A. I.C.A.R. B. I.C.C.R
C. I.C.M.R. D. I.C.W.A.

806. Tulbul project is associated with the:
A. Jhelum B. Beas
C. Ravi D. Sutlej

807. Match List I with List II and select the correct answer using the code given below the lists:

List I	***List II***
(a) Nepa Nagar	1. Oil Refinery
(b) Jharia	2. Paper Mill
(c) Mathura	3. Atomic Energy plant
(d) Kalpakkam	4. Coal mining

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	1	2	3	4
B.	2	4	1	3
C.	4	2	3	1
D.	2	3	4	1

808. Match List-I with List-II and select the correct answer using the code given below the lists:

List-I (City)	***List-II (Characteristics)***
(a) Jammu	1. Sea-front location
(b) Kakinada	2. River-front location
(c) Faizabad	3. Lake-front location
(d) Udaipur	4. Hill-front location

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	1	2	3	4
B.	2	3	4	1
C.	3	4	1	2
D.	4	1	2	3

809. Which one of the following statements describes correctly the birth and death rate trends in present day India?
A. Birth rate is rising and eath rate is falling
B. Birth rate is falling and death rate is rising
C. Both birth and death rates are falling
D. Both birth and death rates are rising

810. Oil refineries in India are generally located near major ports because:
A. oil fields are generally located near the coast
B. dependence on imported raw material
C. refined produce has easy access to market
D. availability of technical skill

811. In which state of India Idduki hydro power porject is located.
A. Kerala
B. Himachal Pradesh
C. Arunachal Pradesh
D. Jammu & Kashmir

812. Ranchi Plateau is an example of:
A. True peneplain
B. Incipient peneplain
C. Fossil peneplain
D. Uplifted peneplain

813. Which one of the following rivers does not have its source in the maikal range?
A. Narmada B. Tapi
C. Sone D. Mahanadi

814. Match List I with List II and select the correct answer using the code given below the lists:

List I	***List II***
(a) Malanjkhand	1. Coal
(b) Kudremukh	2. Copper
(c) Korba	3. Iron-ore
(d) Jaduguda	4. Uranium

Codes:

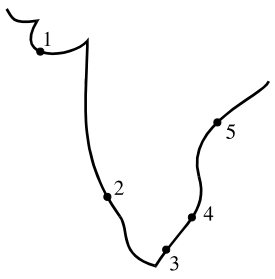
	(a)	*(b)*	*(c)*	*(d)*
A.	1	2	3	4
B.	2	3	4	1
C.	2	3	1	4
D.	4	3	1	2

815. Which one of the following metropolitan cities of India has the lowest density of population?
A. Mumbai B. Kolkata
C. Delhi D. Chennai

816. The correct descending order of the three largest wheat producing states in India is:
A. Punjab, Haryana, Uttar Pradesh
B. Punjab, Uttar Pradesh, Madhya Pradesh
C. Uttar Pradesh, Punjab, Madhya Pradesh
D. Uttar Pradesh Punjab, Haryana

817. From which of the following places the best quality of marble is found in India?
A. Jabalpur B. Bharatpur
C. Makrana D. Jaisalmer

818. Match fishing ports of India labelled as 1, 2, 3, 4 and 5 in the map with their respective names given in the list using the code given below:
(a) Kakinada (b) Kozikhode
(c) Porbandar (d) Tutikorin



Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	2	3	1	4
B.	4	2	5	3
C.	5	2	1	3
D.	5	1	3	4

819. Which of the following river valley projects is the joint enterprise of Andhra Pradesh and Orissa Governments?

A. Machkund B. Mayurakshi
C. Nagarjun sagar D. Pochampad

820. Match List I with List II and select the correct answer using the code given below the lists:

List I	***List II***
(a) Karnataka Plateau	1. Regur
(b) Pat Plateau	2. Red soil
(c) Malwa Plateau	3. Lateritic soil
(d) Northern Circars	4. Alluvial soil

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	4	3	2	1
B.	1	2	3	4
C.	2	1	4	3
D.	2	3	1	4

821. **Assertion (A):** Existing drainage pattern of North India is the outcome of the disruption in the Indo-Brahma river system.

Reason (R): There has been upliftment in the potwar plateau and subsidence in the Malda Gap areas.

Codes:

A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

822. Which one of the following climatic symbols has been used by C.W. Thornthwaite to denote the climate of the Southern Ganga Plateau?

A. AA'r B. BA'W
C. CA'W D. CB'W

823. Which one of the following is not correctly matched?

A. Bhabar : Subterranean drainage
B. Tarai : Marshy land
C. Bhangar : Older alluvium
D. Khadar : Mature alluvium

824. Of which major river system does the Teesta form a part?

A. Ganga B. Brahmaputra
C. Indus D. Godawari

825. Conservation of natural resources aims at one of the following:

A. Total ban on the use of resources for a short duration
B. Partial restriction on their use
C. Rotational use of natural resources
D. Profitable use of natural resources

826. Which one of the following is a foot loose industry?

A. Cement B. Hosiery
C. Sugar D. Jute

827. **Assertion (A):** The green belt represent a planning concept for controlling the physical expansion of large cities.

Reason (R): It is an integral component of a city.

Codes:

A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

828. In which one of the following segments the Yamuna water is called 'green soup' due to heavy pollution load?

A. Delhi — Agra
B. Agra — Yamuna-Chambal confluence
C. Tajewala — Wazirabad
D. Wazirabad — Okhla barrage

829. Which one of the following rivers is called the 'Biological desert' due to heavy pollution load?

A. Ghaghra river
B. Damodar river
C. Periyar river
D. Brahmaputra river

830. Consider the following statements:
Assertion (A): There is close correlation between educational pollution control.
Reason (R): The decline in fertility rate in Kerala provides the best example.
Codes:
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

831. Consider the following statements:
Assertion (A): Green revolution has been spectacularly successful in canal irrigated areas.
Reason (R): Canal irrigation is the cheapest and safest source of irrigation.
Select the correct answer using the code given below.
Codes:
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

832. Which one of the following statements is not correct?
A. Maximum number of cotton yarn and textile mills are located in Gujrat
B. Carpet industry is chiefly in the state of Uttar Pradesh
C. Cotton textile industry provides job to the maximum number of people
D. The first cotton mills was set up at Fort Gloster in Kolkata.

833. Which one of the following is not correctly matched?
A. Kanyakumari : Tamil Nadu
B. Ooty : Karnataka
C. Manas : Asom
D. Simplipal : Orissa

834. Which one of the following is the youngest mountain chain?
A. Annamalai B. Aravalli
C. Siwaliks D. Vindhyan

835. Which one of the following area exhibits identical drainage pattern as that of the Amarkantak hills?
A. Satmala hills B. Mikir hills
C. Mizo hills D. Satpura hills

836. Which one of the following rivers has the largest basin area in India?
A. Brahmaputra B. Godavari
C. Krishna D. Mahanadi

837. Which type of rainfall does take place in the coastal areas of West Bengal and Orissa in April-May?
A. Orographic B. Cyclonic
C. Convectional D. Frontal

838. Consider the following statements:
Assertion (A): The coal-bearing Gondwana rocks in India are found in river valley.
Reason (R): There have been faulting in the Gondwana rock areas.
Select the correct answer using the code given below.
Codes:
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

839. Match List I with List II and select the correct answer using the code given below the lists:

List I (Mineral)	***List II (Place)***
(a) Copper	1. Panna
(b) Gold	2. Ghatsila
(c) Iron-ore	3. Hutty
(d) Diamond	4. Kudremukh

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	2	3	4	1
B.	4	3	2	1
C.	3	4	1	2
D.	1	2	3	4

840. On account of the differences in geological structure and history, India is divided into:
A. One major physiographic unit
B. Two major physiographic units
C. Three major physiographic units
D. Four major physiographic units

841. India is lying entirely in:
A. $23\frac{1}{2}^{\circ}$ N latitude or cancer.
B. 0° latitude or equator.
C. Northern hemisphere.
D. Southern hemisphere.

842. The tropic of cancer passes through:
A. Mizoram, Tripura, West Bengal, Jharkhand, Chattisgarh, M.P., Rajasthan and Gujarat.
B. Sikkim, Bihar, U.P., J&K, H.P. Gujarat, Delhi and Rajasthan.
C. Rajasthan Gujarat, M.P., Bihar, A.P., Tamil Nadu, Kerala and Karnataka.
D. Mizoram, Tripura, W.B, Jharkhand, Bihar, M.P., Gujarat and Rajasthan.

843. Name the place in India where sun is almost overhead all around the year:
A. Andaman and Nicobar islands
B. Arunanchal Pradesh
C. Nagaland
D. Lakshadweep

844. At the northern most part of India the rays of the sun are always.
A. Direct B. Vertical
C. Oblique D. Slanting

845. **Assertion (A):** When the sun has already risen in Arunachal Pradesh. It is still night in Saurashtra.
Reason (R): The east-west extension of India covers almost 30° of longitude.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

846. The Coastline of India is:
A. 7,200 km long B. 4,783 km long
C. 6,300 km long D. 6,100 km long

847. **Assertion (A):** The Himalayan mountain ranges are being described as youthful.
Reason (R): The Himalayan mountain ranges were formed in the last phase of geological history of the earth.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

848. Which among the following ranges acts as a natural barrier between India and Tibbet?
A. Telepala B. Kalim pong
C. Lipu Lekh D. Bara-La-chala

849. .....Mountain range protects India from any danger of attack from the interior of Asia and also keeps off the very dry wind of central Asia.
A. Makalu B. Kanchanjunga
C. Karakoram D. K_2

850. The Himalaya running from west to east for
A. 2700 km. B. 2600 km.
C. 2500 km. D. 2400 km.

851. The Siwaliks represent the outermost range of the Himalayas are made up of
A. Folding of Himalaya
B. Tertiary-sediments
C. Both A and B
D. None of these

852. The Dhang Range and Dundwa Range are the parts of
A. the Trans-Himalayas.
B. the Greater Himalaya
C. Siwalik Range
D. Lesser Himalaya

853. In ancient Indian literature "The Himadri" is referred to:
A. Pir Panjal B. Karakoram
C. lesser Himalaya D. Great Himalaya

854. Shipki La pass is situated in:
A. Uttar Pradesh
B. Uttarakhand
C. Himachal Pradesh
D. Sikkim

855. Zaskar range is another name for:
A. Siwalik Range B. Lesser Himalaya
C. Trans-Himalaya D. Great Himalaya

856. The Himachal lying to the north of the Siwalik Range is mainly composed of:
A. alluvium and thick gravel
B. highly compressed and altered rocks of Algonkian times
C. both A and B
D. only alluvium

857. The Himadri Range is snow bound and having number of glaciers descends from:
A. upto 2,440 m above sea level
B. upto 4,000 m above sea level
C. upto 5000 m above sea level
D. up 4,500 m above sea level

858. The Asom Himalaya stretches from:
A. Tista to Brahmaputra
B. Kali to Tista
C. River Sutlej to Kali
D. None of the above

859. The highest peak of Nanda Devi is of:
A. the Garhwal Himalaya
B. the Central Himalaya
C. the Punjab Himalaya
D. the Kumaon Himalaya

860. Lake chilka is situated in which of the following states?
A. West Bengal B. Andhra Pradesh
C. Madhya Pradesh D. Odisha

861. Khyber pass leads from Afghanistan to:
A. Leh
B. Gilgit
C. Kashmir
D. Plains of Punjab (undivided)

862. The Dehradun Valley covered with thick gravel and alluvium separates.
A. The Himchal and Siwalik range
B. The Siwalik range from the Dhang range
C. None of the above
D. Both A and B

863. Mountain ranges—the Patkoi, Naga separate India from:
A. Tibbet B. Pakistan
C. Myanmar D. China

864. Naga hills form the watershed between:
A. India and China
B. India and Myanmar
C. India and Tibet
D. India and Sri Lanka

865. The Kangra Valley in Himachal Pradesh extends from:
A. the foot of the Dhauladhar range to north-south of Beas.
B. the foot of the Dhauladhar range to north of Beas.
C. between Pir Panjal Himadri.
D. none of the above.

866. Nathu La and Jelepla pass lead from:
A. Afghanistan to Kashmir
B. Gilgit to Leh
C. Sikkim to Tibbet
D. Plains of Punjab to Gilgit

867. The Gulf of mannar separates India from:
A. Sri Lanka B. Bangladesh
C. China D. Pakistan

868. The Kanchanjunga (8598 m) is in:
A. The Himadri
B. Great Himalayas
C. None of the above
D. Both A and B

869. The Laddakh Plateau occupies the:
A. North-eastern portion of Kashmir
B. Tibetan plateau portion
C. Portion of Himachal Pradesh
D. None of the above

870. The Indian Plateau is made up of:
A. Ancient igneous rocks
B. Metamorphic rock
C. Sedimentary rocks
D. Molten Lava

871. **Assertion (A):** During the winter the northern half of India is warmer than the areas in similar latitudinal location by 3° to 8°C.
Reason (R): The great Himalaya checks the Penetration of the cold polar air into India effectively.
A. Both A and R are true and R is the correct explanation of A.
B. Both A and R are true but R is not the correct explanation of A
C. A is false but R is true
D. A is true but R is false

872. Which of the following ranges separates the Kashmir Valley from the Indus Valley?
A. Siwalik range
B. Pir Panjal range
C. Dhaula Dhar range
D. Great Himalayan range

873. Himalayas owe its origin in.....Epoch:
A. Miocene B. Paleocene
C. Oligocene D. Pliocene

874. In the northern, most part of the Himalaya is:
A. Sagarmatha B. Gaurishankar
C. Himadri D. Siwalik

875. Match List I with List II and select the correct answer using the code given below the lists:

List I (Peaks)	***List II (Mountains)***
(a) Doda-Beta	1. Nilgiri
(b) Makalu	2. Himalaya
(c) Dhupgarh	3. Aravalli
(d) Guru Shikhar	4. Satpura

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	2	1	3	4
B.	3	2	1	4
C.	1	2	4	3
D.	4	1	2	3

876. Match List I with List II and select the correct answer using the code given below the lists:

List I	***List II***
(a) Burzil	1. Uttarakhand
(b) Bara Lacha La	2. Himachal Pradesh
(c) Lipu Lekh	3. Sikkim
(d) Nathula	4. Jammu and Kashmir

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	2	1	3	4
B.	3	4	2	1
C.	1	3	4	2
D.	4	2	1	3

877. Which of the following is the highest peak situated in Indian Union?
A. Mt. Everest B. Kanchanjunga
C. K_2 D. Dhaulagiri

878. **Assertion (A):** The Deccan plateau has black soils.
Reason (R): The underlying rock of Deccan Plateau consists of basalt.
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

879. The Western ghats join the Eastern ghats at:
A. Nilgiri Hills B. Javadi Hills
C. Cardamom Hills D. Cap Camorin

880. The range lying north of the upper Godavari is called:
A. Ajanta range B. Balaghat range
C. Satpura range D. Minu range

881. Which of the following is the highest Hill of South India?
A. Cardamom Hill B. Anamalai Hill
C. Rajmahal Hill D. Nilgiri Hill

882. **Assertion (A):** Extra peninsular India is prone to earthquakes.
Reason (R): Extra peninsular India lies in the Himalayan mountain range which has not yet attained stability.
A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

883. Match List I with List II and select the correct answer using the code given below the lists:

List I (Plains)	***List II (Types)***
(a) Imphal basin	1. Lava
(b) Ladakh plain	2. Lacustrine
(c) Konkan Coast	3. Alluvial
(d) Ganga Plain	4. Glacial.

Codes:

	(a)	*(b)*	*(c)*	*(d)*
A.	3	2	1	4
B.	2	4	1	3
C.	4	1	3	2
D.	1	3	4	2

884. Which of the following is the largest Plateau in India?
A. Betul Plateau
B. Deccan Plateau
C. Chhotanagpur Plateau
D. Malwa Plateau

885. Which of the following Indian portion is considered as a remnant of the Gondwana Land?
A. The Gangetic Plain
B. Deccan Plateau
C. Himalaya
D. Punjab Plain

886. Which of the following statements is correct?
A. Himalayas are the oldest mountains
B. Himalayas formed due to folding of the earth's crust
C. Himalayas belong to the caledonian mountain system
D. Himalayas have risen from the sea when the tethys sea got compressed

887. The Dhang, Dundwa and Churia ranges of siwalik are situated in:
A. Myanmar. B. Bhutan.
C. Nepal. D. India.

888. Middle or lesser Himalaya is known as:
A. Sahyadri B. Purvanchal
C. Himachal D. Pir Panjal

889. The Queen of Himalaya is:
A. Dhaulagiri B. Kanchunjunga
C. Nanda Devi D. K_2

890. According to geological history, the oldest mountains is Aravalli and the youngest is:
A. Vindhya B. Sahyadri
C. Eastern Ghat D. Himalaya

891. Which mountain lies parallel to two rivers in Deccan Plateau?
A. Nilgiri B. Satpura
C. Mahadev D. Vindhaya

892. Parasnath hill is situated in:
A. Karnataka Plateau
B. Deccan Plateau
C. Chhotanagpur Plateau
D. Hazaribagh Plateau

893. The Chhattisgarh plain is separated from the Wainganga Valley by:
A. Chhotanagpur Plateau
B. Deccan Plateau
C. Malwa Plateau
D. Khairagarh Plateau

894. Nokrek is the highest peak of the:
A. Mikir Hill B. Garo Hill
C. Khasi Hill D. Jaintia Hill

895. Patkai Bum and Dapha Bum are the important ranges of:
A. lesser Himalaya B. Aravalli
C. Siwalik D. Purvanchal

896. The highest peak of the Nanga range is:
A. Saramati B. Blue Mountain
C. Dapha Bum D. Patkai

897. The Kaimur hill belongs to the:
A. Aravalli range B. Vindhya range
C. Satpura range D. Ajanta range

898. The Dhaula Dhar, the Pir Panjal and Nagtiba are the ranges of:
A. the Siwalik
B. the lesser Himalaya
C. the Aravalli
D. Sahyadri

899. Amindivi and Minikoy islands lie in:
A. Bay of Bengal B. Arabian Sea
C. Indian Ocean D. Atlantic Ocean

900. Bangar and Khadar are the examples of:
A. Black soil B. Alluvial soil
C. Bhabar soil D. Red soil

901. Bhabar is the another name of:
A. Forelands of Himalayas
B. Red soil
C. Black soil
D. Loamy soil

902. The Himalayas came into existence during:
A. Paleozoic age
B. Carboniferous period
C. Tertiary age
D. Both A and B

903. The early tertiary rocks are of:
A. shallow and deep water marine origin
B. fresh water or sub aerial origin
C. only deep water origin
D. None of the above

904. The Brahmaputra system known as ..... in Tibet:
A. Dihang B. Manas
C. Tsangpo D. None of these

905. The Sutlej is the tributory of:
A. Indus
B. Brahmaputra
C. Ganga
D. None of the above

906. Alaknanda and Bhagirathi are the head streams of:
A. Indus B. Brahmaputra
C. Yamuna D. Ganga

907. The largest catchment area is possessed by:
A. Ganga system
B. Brahmaputra system
C. Indus system
D. None of the above

908. The source of river Kosi is:
A. Gangotri B. Yamunotri
C. Tibet D. Kulu Hills

909. Himalayan rivers are fed by:
A. sea inlets
B. only rains
C. melting snow and rain
D. none of these

ANSWER

1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
C	C	B	B	B	C	D	C	C	D
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
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C	A	A	A	C	B	D	B	C	A
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B	C	A	B	A	A	A	B	D	C
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701	**702**	**703**	**704**	**705**	**706**	**707**	**708**	**709**	**710**
D	D	C	C	C	B	C	C	A	B
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C	B	D	D	C	A	B	A	D	B
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A	A	B	D	B	C	B	C	D	A
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A	D	B	B	C	A	D	A	B	D
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901	**902**	**903**	**904**	**905**	**906**	**907**	**908**	**909**	
A	C	A	C	A	D	C	C	C	

About the Book

The present book 'Objective Geography', in objective MCQ-format, has been specially published keeping in mind the requirements of students, exam-aspirants and other readers with academic as well as competitions' point of view. The book is especially useful for the aspirants of various competitive exams where Objective Geography forms an essential part of the Examination.

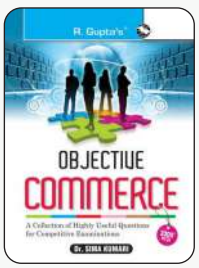
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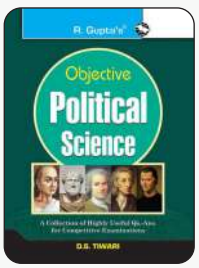
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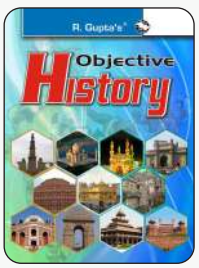
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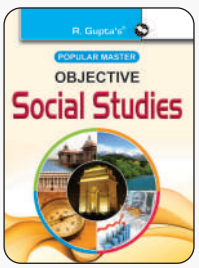
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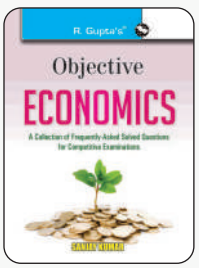
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