

## D. P. Bhosale College, Koregaon.

### Department of Microbiology

#### Question Bank Semester V

#### Paper XIV Microbial Biochemistry

**Q1) Select the correct alternative & rewrite the complete sentence.**

- 1) The term enzyme was coined by.....
  - a) Robert Koch b) Elie Metchnikoff
  - b) Wilhem kuhne d) Louis Pasteur
- 2) In Lac operon , the gene product of Lac z gene is .....
  - a) Beta-galactosidase b) Beta- galactoside permease
  - c) Beta- galactoside transacetylase d) Beta- galactoside isomerase
- 3) The enzymes which are produced by the cell in response to the presence of particular substrate or a related substance is called as.....
  - a) Inducible enzymes b) intracellular enzyme
  - c) constitutive enzyme d) endo enzyme
- 4) Koshland proposed ..... model .
  - a) Fluid mosaic model b) Induced fit model
  - c) Lock & key model d) Operon model
- 5) Enzymes are made up of.....
  - a) Fats b) proteins
  - c) Vitamins d) sugars
- 6) The valency of Nitrogen in the form of Nitrate is-----
  - a) +5 b) +3
  - c) +6 d) +4
- 7) Conversion of Glucose to Glucose-6-Phosphate is catalyzed by.....
  - a) Hexokinase b) Lactonase
  - c) Isomerase d) Dehydrogenase

8) An enzyme that joins the ends of two strands of nucleic acid is .....

- a) Polymerase b) Helicase
- c) Ligase D) synthase

9) DNA replication is -----

- a) conservative b)dispersive
- c) nonconservative d)semiconservative

10) Enzyme nitrogenase requires .....ions to be active.

- a) Ca b) Mg
- c) Mo-Fe d) Co

11. Allosteric enzymes are..... enzymes.

- a) regulatory b)nonregulatory
- c) Inducible d) iso

12. ----- model of allosteric enzyme is called as sequential model.

- a) MWC b) KNF
- c) WCM d) NRF

13. The “Lock and key” theory of enzyme action was put forward by.....

- a. Koshland b) Fischer
- c. Kuhne d. Arrhenius

14. Ribosomes are made up of .....

- a) RNA b) RNA and Proteins
- c.) RNA, DNA and Proteins d) Nucleic acids, proteins and lipids

15. GOGAT system involve in -----assimilation.

- a) sulfur b)carbon
- c) nitrogen d)phosphorus

16) In ion-exchange chromatography .....

- a. Proteins are separated on the basis of their net charge
- b. Proteins are separated on the basis of their size
- c. Proteins are separated on the basis of their shape
- d) proteins are separated on the basis of their molecular weight

17. ----- is the primary acceptor of CO<sub>2</sub> in assimilation of carbon.

a) Ribose 5-phosphate b) Ribulose-5-phosphate

c) Ribulose 1,5 diphosphate d) Ribose 1,5, diphosphate

18. ----- enzyme is the major enzyme involved in Glyoxylate pathway.

a) Isocitrate dehydrogenase b) Isocitrate decarboxylase

c) Isocitrate lyase d) Isocitrate dehydratase

19) The termination codon on m-RNA is -----.

a) UUU b) UAC

c) UCA d) UAA

20) In protein synthesis, relative movement of ribosome through one codon is called as -----  
.

(a) Transcription b) translation

c) Translocation d) transversion

21). When initial velocity is half the maximum velocity,  $K_m$  is equal to -----.

a. (S) b (ES)

c. (E) d. (ET)

22). The first immobilized enzyme was-----.

a) Isomerase b) Hydrolase

c) Ligase d) Invertase

23) In enzyme classification, the first digit indicates----- of enzyme.

a) class b) subclass

c) sub-sub class d) serial number

24) ----- is commonly used for crosslinking of enzyme in enzyme classification.

a) Cyanogen bromide b) Glutaraldehyde

c) Polyacryl amide d) DEAE-cellulose

25) Conversion of messages carried by m-RNA into amino acid sequence is called as----.

a) Replication b) Transcription

c) Translation d) Translocation

26) The widely used inorganic divalent salt for salt precipitation, in enzyme purification is ---  
--.

a) Ammonium nitrate b) Sodium nitrate

c) Ammonium sulfate d) sodium sulfate

- 27) Enzyme Nitrogenase requires .....ions to be active.  
 a) Ca b) Mg  
 c) Mo-Fe d) Co
- 28) ----- is an initiation codon in polypeptide chain synthesis.  
 a) UAA b) AUG  
 c) CUG d) GUG
- 29) Gel chromatography is based on ----- character of enzyme.  
 a) Affinity b) Adsorption  
 c) Solubility d) molecular size
- 30) Uptake of nutrients and incorporation of it into cellular constituents is called as -----.  
 a) Absorption b) assimilation  
 c) Adsorption d) dissimilation
- 31) ----- is the key enzyme of ED pathway.  
 a) Phosphoketolase b) Phosphoglucoisomerase  
 c) KDPG aldolase d) Isocitrate lyase
- 32)  $V_o = \frac{V_{max}}{1 + \frac{K_m}{S}}$   
 a)  $V_{max}$  b)  $S$   
 c)  $V_{max}$  d)  $K_m$
- 33) ----- enzyme do not follow Michelis-Menten equation.  
 a) Allosteric b) Induced  
 c) Iso d) nonregulatory
- 34) ----- acts as proof reader and edits mismatched base pairs during replication of DNA .  
 a) DNA template b) RNA primer  
 c) DNA polymerase d) RNA polymerase
- 35) Enzyme catalyse reaction by sharing electron pair is called as ----- catalysis.  
 a) Proximity b) covalent  
 c) Distortion d) acid-base
- 36) ----- method is generally preferred for enzyme assay.  
 a) Diffusion assay b) spectrophotometric assay  
 c) Turbidometric assay d) chemical assay

37) Lactose operon model was proposed by ----- and -----.

- a) Ehrlich, Monod b) Kunhe, Ehrlich
- c) Jacob, Monod d) Jacob, Ehrlich

38) The second class of enzyme in enzyme classification is -----.

- a) Oxidoreductases b) Trasferases
- c) Lyases d) Hydrolases

39) The phenomenon in which glucose is used preferentially and the synthesis of enzyme for metabolism of other sugar is repressed is called as -----.

- a) End product repression b) end product inhibition
- c) catabolite repression d) feed back inhibition

40) The specificity of enzyme towards optical isomers of substrate is called as ----- specificity.

- a) Absolute b) Group
- c) Geometric d) Stereo chemical

## **Q.2 Long answer type questions.**

1. Describe in detail the biosynthesis of DNA.
2. Describe Lac operon model and catabolite repression mechanism in regulation of enzyme synthesis.
3. Explain in detail factors affecting catalytic efficiency of enzyme .
4. Describe in detail 'Phosphoketolase' Pathway.
- 5 Explain in detail Biosynthesis of Peptidoglycan
- 6 Describe in details "Biosynthesis of Proteins"
7. What is Assimilation? Explain in details Assimilation of Carbon
8. Describe Purification of enzymes on the basis of Molecular size, and Solubility differences of enzyme.
9. Explain different methods of preparation of Immobilization of enzymes.
- 10 What is GOGAT system ? explain in detail assimilation of nitrogen.
11. Describe assimilation of Sulfur in detail.
12. Mention applications of Immobilized enzymes.
13. Explain factors affecting enzyme activity in detail.
14. Describe purification of enzymes on the basis of adsorption and affinity character of enzyme.

15. Explain in detail classification of enzyme with examples.

### **Q.3 Short notes.**

- 1) Assay of enzyme based on substrate and product estimation.
- 2) ED Pathway
- 3) Pyruvate as a key intermediate.
- 4) Isozymes
- 5) Ara operon.
- 6) Basics of enzyme classification
- 7) Allosteric enzyme
- 8) Purification of enzymes
- 9) Assimilation of sulfur
- 10) Derivation of Michaelis-Menten equation and significance of  $K_m$ .
- 11) Methods of extraction of extracellular enzymes
- 12) Applications of Immobilization of enzymes
- 13) Proximity and orientation
- 14) Effect of substrate concentration on enzyme activity
- 15) Significance of  $K_m$  and  $V_{max}$
- 16) Phosphoketolase pathway
- 17) Glyoxylate bypass
- 18). Lac operon
- 19) Lock & Key hypothesis
- 20) Catabolite repression
- 21) Competitive inhibition
- 22) Enzyme specificity
- 23) Gel chromatography
- 24) t-RNA
- 25) Adsorption chromatography
- 26) Ion exchange chromatography
- 27) GOGAT
- 28) Structure of enzyme

27) Translation mechanism in protein synthesis

28) Induced fit model

29) Inducible enzymes

30) Affinity chromatography