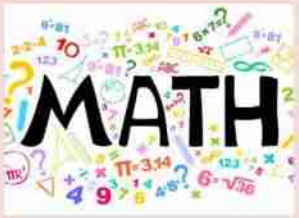

D. P. Bhosale College, Koregaon

Department of Mathematics and Statistics

Notice

Date - 20 / 01 / 2024

All the students of B.Sc. II & III are here by informed that the Department of Mathematics has organized the Student's Seminar on Wednesday, 24th January, 2024. All the Students should present at 11:30 a.m. in the department of Mathematics.

D P BHOSALE COLLEGE KOREGAON

Head
Department of Mathematics
D. P. Bhosale College, Koregaon

D. P. Bhosale College, Koregaon

Department of Mathematics and Statistics

Student's Seminar (2023-24)

Brief Report

The Department of Mathematics organized a Student's Seminar for overall round development of the students, in the academic year 2023-24 on Wednesday, 24th January, 2024. The main objective of this activity is to provide an opportunity for participants to gain knowledge and skills through lectures, to improve logical thinking, discussing about the relevant topics of the particular subject, to learn about the latest information and new skills related to the subject, to improve teaching skills and personality development among the students.

The 06 students are participated in this activity. Students represent seminar on various topics such as, definition and examples of Group theory, Mathematical Logic, Numerical Methods, Gamma & Beta function, Second Order differential equations, Green's Theorem with Examples.

Head
Department of Mathematics
D. P. Bhosale College, Koregaon

D. P. BHOSALE COLLEGE KOREGAON

I/C PRINCIPAL
D. P. BHOSALE COLLEGE
KOREGAON

D. P. Bhosale College, Koregaon

Department of Mathematics and Statistics

Student's Seminar (2023-24)

D. P. Bhosale College, Koregaon

Department of Mathematics and Statistics

Student's Seminar (2023-24)

D. P. Bhosale College, Koregaon

Department of Mathematics and Statistics

Student's Seminar (2023-24)

Sr. No.	Roll No.	Name of the Student	Seminar Topic	Signature
1	20233201	Bhosale Devaki Balkrishna	Mathematical Logic	
2	20233202	Kshirsagar Kalyani Sanjay	Definition and Properties of Group theory	
3	20233102	Bhosale Ravina Ananda	Numerical Methods	
4	20233108	Jadhav Gayatri Sandeep	Gamma & Beta function	G.S. Jadhav
5	20233110	Jadhav Sanika Sanjay	Second Order differential equations	S.S.Jadhav
6	20233117	Makhare Shravani Sampat	Green's Theorem with Examples	

D.P. BHOSALE COLLEGE KOREGAON

Head
Department of Mathematics
D. P. Bhosale College, Koregaon

Rayat Shikshan Sanstha's,

D.P.Bhosale College Koregaon

Department Of Mathematics

Seminar Activity (2023-24)

Name of the Student: Bhosale Devaki Balkrishna

Roll No. : 22283201 **Date:** 24/01/2024

Paper No. 15 **Class:** TY. BSc.

Topic: Logic **Signature of student:**

Synopsis:

- Logic :- Logic is a system based on propositions.
- Statement :-

A statement or proposition is a sentences that is true or false but not both.

e.g: i) "Paris is in France" - This is a statement which is true

ii) $y > 5$ - This is depends on value y.

Therefore, we can't a statement

- Two types of statements :-

1) Atomic statement : A statement which contain no logical connectives are called atomic statements.

e.g: i) Blood is red ii) Roses are blue

2) Compound statement :- A statement which contain logical connectives are called compound statement.

e.g: $1+2=4$ or $3+3=6$

Reference Books: Discrete Mathematics - Hari Kishan, Shiv Raj Pundir.

Marks Obtained: 10/10

Sign of Teacher:

Rayat Shikshan Sanstha's,

D.P.Bhosale College Koregaon

Department Of Mathematics

Seminar Activity (2023-24)

Name of the Student: Kshirsagar Kalyani Sanjay

Roll No. : 20233202 **Date:** 24/01/2024

Paper No. XIII **Class:** T.Y.BSc

Topic: Group theory **Signature of student:** Kalyani

Synopsis: Defination of Group :- A non-empty set G with binary Operation * is said to be group. if following properties are satiesfied

1] Closure property :-

$$a*b = b*a \; ; \forall \; a,b \in G$$

2] Associative property :-

$$a*(b*c) = (a*b)*c \; ; \forall \; a,b,c \in G$$

3] Existence of identity element :-

$$a*e = a = e*a \; ; \forall \; a \in G$$

4] Existence of inverse element :-

$$a*a' = a'*a$$

Defination of abelian group :- A group is abelian if its binary operation is commutative.

Reference Books: A Course in Abstract algebra. - VK&SK

Marks Obtained: 10/10

Sign of Teacher: A Utake

Rayat Shikshan Sanstha's,

D.P.Bhosale College Koregaon

Department Of Mathematics

Seminar Activity (2023-24)

Name of the Student: Bhosale Rovina Anandu.

Roll No. : 20233102 **Date:** 24-1-24

Paper No. **Class:** B.Sc II

Topic: Introduction to numerical methods. **Signature of student:** RBhosale

Synopsis:

* Numerical Methods: Algorithms that are used to obtain numerical solutions of a mathematical problem.
  1] No analytical solution exists.
  2] An analytical solution is difficult to obtain or not Practical.

* Methods for solving non linear equation

1] Bisection Method :- The bisection method is used to find the root of a polynomial function.

2] Newton-Raphson Method :- is referred for to as one of the most commonly used techniques for finding the roots of given equation.

3] Secant Method :- is a root-finding algorithm that uses a succession of roots of secant lines to better approximate a root of a function f.

Reference Books:

Marks Obtained: 9/10

Sign of Teacher:

Rayat Shikshan Sanstha's,

D.P.Bhosale College Koregaon

Department Of Mathematics

Seminar Activity (2023-24)

Name of the Student: Jadhav Gayatri Sandeep

Roll No. : 2023 3101 **Date:** 24-01-2024

Paper No. VIII **Class:** B.Sc.II

Topic: Gamma & Beta function **Signature of student:** G.S.Jadhav

Synopsis:

Gamma function - It is denoted by Γn and pronounced as "gamman" is defined as value of improper integral $\int_0^\infty x^{n-1} e^{-x} dx$, where $n>0$

Properties -

1. $\Gamma n+1 = n\,\Gamma n$
2. $\Gamma n = \lfloor n-1 = (n-1)!$
3. $\Gamma 1 = 1$
4. $\lim_{n\to\infty} \Gamma n = \infty$
5. $\lim_{n\to 0} \Gamma n = 1$
6. $\Gamma n = 2\int_0^\infty e^{-x^2} x^{2n-1} dx$

Beta function - Beta function is defined as the value of improper integral $\int_0^1 x^{m-1}(1-x)^{n-1} dx$, $m>0, n>0$

Properties -

1. $\beta(m,n) = \beta(n,m)$
2. $\beta(m,n) = 2\int_0^{\pi/2} \sin^{2m-1}\theta \cos^{2n-1}\theta\, d\theta$
3. $\beta(m,n) = \int_0^\infty \frac{x^{m-1}}{(1+x)^{m+n}} dx$
4. $\int_0^{\pi/2} \sin^p x \cos^q x\, dx = \frac{1}{2}\beta\left(\frac{p+1}{2}, \frac{q+1}{2}\right)$

Reference Books: Integral calculus, Phadke prakashan

Marks Obtained: 9/10

Sign of Teacher:

Rayat Shikshan Sanstha's,

D.P.Bhosale College Koregaon

Department Of Mathematics

Seminar Activity (2023-24)

Name of the Student: Jadhav Sanika Sanjay

Roll No. : 2023110 **Date:** 24-01-24

Paper No. V **Class:** B.Sc. II

Topic: Second Order differential equations **Signature of student:** S.S.Jadhav

Synopsis:

Linear differential equations of second order-

most general form of this equation is,

$$\frac{d^2y}{dx^2} + P\frac{dy}{dx} + Qy = R$$

equation can be written as, $f(D)\,y = R$

methods of solving above eqn - 1) one solution of $f(D)\,y = 0$ is known.

2) Soln by change of dependent variable

3) Soln by change of independent variable.

Examples - 1) Solve $x\frac{d^2y}{dx^2} - 2(x+1)\frac{dy}{dx} + (x+2)y = (x-2)e^{2x}$

2) solve $x^2\frac{d^2y}{dx^2} - 2(x^2+x)\frac{dy}{dx} + (x^2+2x+2)y = 0$

3) Solve $(1-x^2)\frac{d^2y}{dx^2} - \frac{1}{x}\frac{dy}{dx} + x^2y = 0$

Reference Books: Textbook of B.Sc. II - Elements of Differential equations

Marks Obtained: 10/10

Sign of Teacher: A.S.Kadam

Rayat Shikshan Sanstha's,

D.P.Bhosale College Koregaon

Department Of Mathematics

Seminar Activity (2023-24)

Name of the Student: Makhare Shravani Sampat

Roll No. : 2023317 **Date:** 24-01-2024

Paper No. VII **Class:** B.Sc. III

Topic: Green's theorem with examples **Signature of student:** Makhare

Synopsis: Green's theorem in the plane-

Statement - Let R be closed bounded region in x-y plane whose boundry C consists of finitely many smooth curves. Let M and N be continuous functions of x and y having continuous partial derivatives $\frac{\partial M}{\partial y}$ and $\frac{\partial N}{\partial x}$ in R then,

$$\iint_R \left(\frac{\partial N}{\partial x} - \frac{\partial M}{\partial y}\right) dx\,dy = \oint_C (M\,dx + N\,dy)$$

Examples - 1) Evaluate by Green's theorem $\int_C [e^{-x}\sin y\,dx + e^{-x}\cos y\,dy]$ where C is rectangle, whose vertices are $(0,0), (\pi,0), \left(\pi, \frac{\pi}{2}\right), \left(0, \frac{\pi}{2}\right)$

2) verify Green's theorem in plane for $\int_C (xy + y^2)\,dx + x^2\,dy$ where C is close curve bounded by $y = x$ and $y = x^2$

3) By using Green's theorem, show that area bounded by a simple closed curve C is given by $\frac{1}{2}\int_C (x\,dy - y\,dx)$

Reference Books: Vector Calculus, Niraliprakashan, textbook of B.Sc. III

Marks Obtained: 9/10

Sign of Teacher: Akwake