SARASWATI Education Society's
SARASWATI Institute of Technology
Learn Live Achieve and Contribute
Kharghar, Navi Mumbai - 410 210.

Science And Humanities Department (Academic Year :2022-23)

Vision:-"To contribute to society through excellence in scientific & knowledgeable based education of computer science professional".

Mission:-

- **To transform students into technically components, socially responsible & ethical computer science professionals.**
- **To promote a creative teaching-learning process that will strive for academic excellence in the field of computer engineering.**
- **To enhance the technical expertise of students through workshop & industry-institute interaction.**

Subject Name:-Applied Mathematics **Date:-**

Assignment No:-01

Topic Name:-

Course outcomes: - Solve board –based technology problems using the principles Of basic mathematics

1) a. F(x)= sinx , Show that $F(3x)=3f(x)-4f^3(x)$
   b. F(x)=$\frac{1}{1-x}$ find f [f(x)]
2) a. F(x)=$\frac{1}{1-x}$ $show\ that\ f\{f[f(x)]) = x$
   b. State weather the function f(x)=$\frac{a^x+a^{-x}}{2}$ is even or add function
3) $F(x) = 3x^4+x^2=5-3\cos+2\sin^2 x$ then show that f(x)+f(-x)=2f(x)
4) If f(x) = log $\frac{1+x}{1-x}$ then prove that f ($\frac{2x}{1+x^2}$)=2f(x)
5) If Y=f(x) =$\frac{2x-3}{3x-2}$ then prove that x=f(y)

Last date of Submission:-

Name of course coordinator:- Mrs Vrushali Patil

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Subject Name:-Applied Mathematics Date:-

Assignment No:-02

Topic Name:-

Course outcomes :- Solve board –based technology problems using the principles Of basic mathematics

1. Find $\frac{dy}{dx}$,If y=$\frac{sinx}{1+cosx}$

2. Differntiate$\frac{e^x-1}{e^x+1}$ with respect to 'x'

3.If log (x+$\sqrt{x^2+a^2}$), Find $\frac{dy}{dx}$.

4. If log($\sqrt{x^2+y^2}$) = $\tan^{-1}\frac{y}{x}$ Find $\frac{dy}{dx}$

5.Differentite with respect to'x' $\sin^{-1}(\frac{2x}{1+x^2})$

6. Differentite with respect to'x' $\sec^{-1}(\frac{1}{4x^3-3x})$

7. Differentite with respect to'x' $\tan^{-1}(\frac{sinx}{1+cosx})$

8. Differentite with respect to'x' $\tan^{-1}(\frac{5x}{1-6x^2})$

9. x^2+y^2= 4xy Find $\frac{dy}{dx}$ $at\ (2,-1)$

10. Find $\frac{dy}{dx}$ If y=x^x+sin^x

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Subject Name:-Applied Mathematics **Date:-**

Assignment No:-03

Topic Name:-

Course outcomes :- Solve board –based technology problems using the principles Of basic mathematics

1. Find the radius of th curve xy=c at point (c,c)
2. Find maximum and minima of the equation tanx-2x
3. Find maximum and minima of the equation x^3-18x^2+96x
4. Find the equation of tangent and normal to the curve y=x(2-x)at point (2,0)
5. Find the point on the curve y=7x-3x^2 where the inclination of the tangent is 45^0.
6. A telegraph wire hangs in the form of a curve y = a log [sec ($\frac{x}{a}$)]. Where a is a constant. Show that, radius of curvature at any point is a.sec($\frac{x}{a}$)
7. Find the equation of tangent to the curve y= $9x^2$-12x+7 which is parallel to x axis.

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Subject Name:-Applied Mathematics **Date:-**

Assignment No:-04

Topic Name:-

Course outcomes :- Solve board –based technology problems using the principles Of basic mathematics

1.Evaluate $\int \frac{1}{x^2+3x+2}$dx

2. Evaluate $\int \frac{1}{x[9+(logx)^2]}$ dx

3. Evaluate $\int \frac{1}{(x+3)\,(x+2)}$ dx

4. Evaluate $\int x.e^x$dx

5.Evaluate $\int sin^3x.cosx$dx

6.Evaluate $\int \frac{e^x\ (x+1)}{cos^2(x.e^x)}$

7. Evaluate $\int \frac{dx}{5-4cosx}$dx

8. Evaluate $\int e^e + x^e + e^x$dx

9. Evaluate $\int x.e^x$dx

10.Evaluate $\int \frac{4x+3}{x^{2+}5x+9}$ dx

11. Evaluate $\int sin^3x$dx

12. Evaluate $\int \frac{x}{(x^2-1)(x^2+2)}$d

x

13. Evaluate $\int \frac{(\sin^{-1})\,x^3}{\sqrt{1-x^2}}$dx

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Subject Name:-Applied Mathematics **Date:-**

Assignment No:-05

Topic Name:-

Course outcomes :- Solve board –based technology problems using the principles Of basic mathematics

1. Evaluate $\int_0^2 \frac{5x+2}{x^2+4}dx$

2.Evaluate $\int_0^{\frac{\pi}{2}} \frac{1}{1+\sqrt[n]{\cot x}}dx$

3.Evaluate $\int_0^{\frac{\pi}{4}} \log(1tanx)$

4.Evaluate. $\int_1^3 \frac{\sqrt[3]{x+5}}{\sqrt[3]{x+5}+\sqrt[3]{9-x}}dx$

5.Find the area of the region bounded by the curve $y=4x^2$,x-axis and the lines x=1 andx=2

6.Find the area of circle $x^2+y^2=16$ using Integration.

7.Find the area bounded between the parabolas $y^2=9x$ and $x^2=9y$

8.Find the area between the parabola $y=x^2+3$ and y=x+3

9.Find the area between the parabola $y=4x-x^2$and x-axis.

10.By using method of integration find the area of circle $x^2+y^2=a^2$

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Subject Name:-Applied Mathematics **Date:-**

Assignment No:-06

Topic Name:-

Course outcomes :- Solve board –based technology problems using the principles Of basic mathematics

1. Find the order and degree of the differential equation $\sqrt[3]{\frac{dy}{dx}+y}=\sqrt[4]{\frac{d^2y}{dx^2}}$
2. From the differential equation whose solution is , y=Acos3t +Bsin3t
3. Verify that $y = \log x$ is a solution of differential equation $x\frac{d^2y}{dx^2}+\frac{dy}{dx}=0$
4. Solve the differential equation $\frac{dy}{dx} = e^{3x-2y} + x^2e^{-2y}$
5. Solve $\sec^2x.\tan y dx+\sec^2y.\tan x=0$ if $y=\frac{\pi}{4}$ when $x=\frac{\pi}{4}$
6. Solve the differential equation $\frac{dy}{dx} = (4x + y + 1)^2$
7. Solve the differential equation $\frac{dy}{dx}= \cos(x+y)$
8. Solve $(x^3 + y^3)\ \frac{dy}{dx} = x^2y$
9. Solve $\frac{dy}{dx}+y\cot x=\operatorname{cosec} x$.
10. Solve the differential equation $(x+1)\ \frac{dy}{dx}-y=e^x(1+x)^2$

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Subject Name:-Applied Mathematics **Date:-**

Assignment No:-07

Topic Name:-

Course outcomes :- Solve board –based technology problems using the principles Of basic mathematics

i) Solve the equation by Gauss - Seidal method. (two iterations only)
$10x + y + 2z = 13$, $3x + 10y + z = 14$, $2x + 3y + 10z = 15$
ii) Solve the following system of equation by using Jacobi-Iteration method. (two iterations)
$5x + 2y + z = 12$, $x + 4y + 2z = 15$, $x + 2y + 5z = 20$
2) Solve the following system of equations by using Gauss elimination method.
$x + 2y + 3z = 14$, $3x + y + 2z = 11$, $2x + 3y + z = 11$

3) Using Newton – Raphson method find the approximate root of the equation (use four iterations)
$x2 + x - 5 = 0$

4) Solve the following :
Find the root of the equation $\cos x - x e x = 0$ using the regular-falsi method. (carry out two iterations)
5) Solve the following system of equations by using Gauss Elimination method.
$2x + 3y + z = 13, \quad x - y - 2z = -1, \quad 3x + y + 4z = 15.$
5) Solve the following system of equations by using Gauss Seidal method.
$20x + y - 2z = 17 \; ; \; 3x + 20y - z = -18 \; ; \quad 2x - 3y + 20z = 25.$
6) Using Newton-Raphson method to find the approximate root of the equation $x \log_{10} x = 1.2$. (carry out three iterations)
7) Solve the equation by Gauss - Seidal method. (two iterations only)
$10x + y + 2z = 13, \quad 3x + 10y + z = 14, \quad 2x + 3y + 10z = 15$
8) Solve the following system of equation by using Jacobi-Iteration method. (two iterations)
$5x + 2y + z = 12, \quad x + 4y + 2z = 15, \quad x + 2y + 5z = 20$
9) Solve the following system of equations by using Gauss elimination method.
$x + 2y + 3z = 14, \quad 3x + y + 2z = 2x + 3y + z = 11$
11,

$5x + 2y + z = 12,$

$x + 4y + 2z = 15,$

$x + 2y + 5z = 20$

0

4. Solve the differential equation $\frac{dy}{dx} = e^{3x-2y} + x^2 e^{-2y}$

5. Solve $\sec^2 x.\tan y dx + \sec^2 y.\tan x = 0$ if $y = \frac{\pi}{4}$ when $x = \frac{\pi}{4}$

6. Solve the differential equation $\frac{dy}{dx} = (4x + y + 1)^2$

7. Solve the differential equation $\frac{dy}{dx} = \cos(x+y)$

8. Solve $(x^3 + y^3)\ \frac{dy}{dx} = x^2 y$

9. Solve $\frac{dy}{dx} + y\cot x = \operatorname{cosec} x$.

10. Solve the differential equation $(x+1)\ \frac{dy}{dx} - y = e^x (1+x)^2$

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