



Department of Civil Engineering

Vision: “To impart quality technical education beneficial to industry and the society in the field of Civil Engineering.”.

- **Mission:**
 - To arrange academic and technical expertise.
 - To improve the practical knowledge of the student as per current scenario of industry.
 - To make the students socially and ethically responsible.

Assignment No :- 01

Subject : Maths

Topic Name :- Function and limits

1) If $f(x) = \frac{x^2+1}{x^3-1}$, find $f\left(\frac{1}{2}\right)$

2) If $f(x) = x^3 - 5x^2 - 4x + 20$

3) If $f(x) = 64^x + \log_3 x$, find $f\left(\frac{1}{3}\right)$

4) If $f(x) = x^2 - 3x + 4$

5) If $f(x) = \frac{x-4}{4x-1}$

6) State whether the function $f(x) = x^3 - 3x + \sin x + x \cos x$ is even or odd.

7) If $f(x) = \log_{10} x$ and $g(x) = 100^x$

Date of Submission :-

Assign By :- Ms.Nasreen Ansari



Department of Civil Engineering

Vision: “To impart quality technical education beneficial to industry and the society in the field of Civil Engineering.”.

- **Mission:**
 - To arrange academic and technical expertise.
 - To improve the practical knowledge of the student as per current scenario of industry.
 - To make the students socially and ethically responsible.

Assignment No :- 02

Subject : Maths

Topic Name :- Derivatives

Q.1) Find $\frac{dy}{dx}$, if $y = x^{10} + 10^x + e^x$

Q.2) Find $\frac{dy}{dx}$, $y = 5 \cdot x^7$

Q.3) Find $\frac{dy}{dx}$, $y = \frac{\sin x}{\sqrt{1 + \cos x}}$

Q.4) Find $\frac{dy}{dx}$, $y = (3x^2 + 2)^5$

Q.5) Find $\frac{dy}{dx}$, if $y = e^{x \cdot \sin^{-1} x}$

Q.6) Differentiate $\tan^{-1} \left(\frac{2x}{1+35x^2} \right)$ w.r.t 'x'

Q.7) If $y = \sin^{-1} (3x - 4x^3)$ Find $\frac{dy}{dx}$

Q.8) Find $\frac{dy}{dx}$ if $x^2 + y^2 = xy$

Q.9) Find $\frac{dy}{dx}$ if $x = \cos \theta$

Q.10) If $x^2 + y^2 + xy - y = 0$ find $\frac{dy}{dx}$ at (1,2)

Date of Submission :-

Assign By :- Ms.Nasreen Ansari



Department of Civil Engineering

Vision: “To impart quality technical education beneficial to industry and the society in the field of Civil Engineering.”.

- **Mission:**
 - To arrange academic and technical expertise.
 - To improve the practical knowledge of the student as per current scenario of industry.
 - To make the students socially and ethically responsible.

Assignment No :- 03

Subject : Maths

Topic Name :- Application of Derivatives

Q.1) If $y = \log x$ show that $x \frac{d^2y}{dx^2} + \frac{dy}{dx} = 0$

Q.2) Find the slope of the tangent and normal of the following curves.

a) $y = 3x^4 - 4x$ at $x = 4$

b) $y = \sqrt{x^3}$ at $x = 4$

Q.3) Find maxima & minima of $x^3 - 18x^2 + 96x$

Q.4) A metal wire 36 cm long is bent to form a rectangle. Find its dimensions when the area is maximum.

Q.5) Find the radius of curvature of the curve $y = x^3(2,8)$

Q.6) Find the maximum & minimum value of $y = x^3 - 9x^2 + 24x$

Date of Submission :-

Assign By :- Ms.Nasreen Ansari



Department of Civil Engineering

Vision: “To impart quality technical education beneficial to industry and the society in the field of Civil Engineering.”.

- **Mission:**
 - To arrange academic and technical expertise.
 - To improve the practical knowledge of the student as per current scenario of industry.
 - To make the students socially and ethically responsible.

Assignment No :- 04

Subject : Maths

Topic Name :- Integration

Q.1) Evaluate $\int x(x+2)^2 dx$

Q.2) Evaluate $\int (1-x^2)^{10} dx$

Q.3) Evaluate $\int \sqrt{\frac{1+\cos}{1-\cos}} dx$

Q.4) Evaluate $\int \frac{\tan(\log x)}{x} dx$

Q.5) Evaluate $\int \frac{e^m \tan^{-1} x}{1+x^2} dx$

Q.6) Evaluate $\int \sin^5 x \cdot \cos x dx$

Q.7) Evaluate $\int \cos^{-1}(\sin x) dx$

Q.8) Evaluate $\int \frac{dx}{x^2+9}$

Date of Submission :-

Assign By :- Ms.Nasreen Ansari



Department of Civil Engineering

Vision: “To impart quality technical education beneficial to industry and the society in the field of Civil Engineering.”.

- **Mission:**
 - To arrange academic and technical expertise.
 - To improve the practical knowledge of the student as per current scenario of industry.
 - To make the students socially and ethically responsible.

Assignment No :- 05

Subject : Maths

Topic Name :- definite integral & application of definite intgration

Q.1) Evaluate $\int_0^{\frac{\pi}{2}} \frac{dx}{1+x^2}$

Q.2) Evaluate $\int_0^{\frac{\pi}{4}} x \cdot \sec^2 x \, dx$

Q.3)i. Evaluate: $\int_4^5 \frac{\sqrt{5-x}}{\sqrt{x-4} + \sqrt{5-x}} \, dx$

ii. Evaluate: $\int_0^{\pi/2} \frac{\tan x}{\tan x + \cot x} \, dx$ iii. $\int_1^e \frac{1}{x} \cdot \log x \, dx$

Q.4) solve the following.

Find the area of an ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

Find the area of the circle $x^2 + y^2 = r^2$ by integration.

Date of Submission :-

Assign By :- Ms.Nasreen Ansari



Department of Civil Engineering

Vision: “To impart quality technical education beneficial to industry and the society in the field of Civil Engineering.”.

- **Mission:**
 - To arrange academic and technical expertise.
 - To improve the practical knowledge of the student as per current scenario of industry.
 - To make the students socially and ethically responsible.

Assignment No :- 06

Subject : Maths

Topic Name :- Differential Equation & Application of Differential Equation

Q.1)

Find the order & degree of the differential equation $\frac{d^2x}{dt^2} + \left(\frac{dx}{dt}\right)^3 = \sqrt{5}x$

Q.2)

Find the order & degree of the differential equation $\frac{d^2y}{dx^2} = \left(y + \frac{dy}{dx}\right)^{3/2}$

Q.3)

Form the differential equation by eliminating the arbitrary constants if $y = A e^{2x} + B e^{3x}$

Q.4)

Find the equation of the curve whose slope at any point is $3x^2 - 2x + 1$ and it passes through the point (2, 3)

Q.5) Find integrating factor of $(1 + x^2) \frac{dy}{dx} + y = e^{\tan^{-1}x}$

Q.6) Solve: $\frac{dy}{dx} = e^{x-y} + x e^{-y}$

Date of Submission :-

Assign By :- Ms.Nasreen Ansari



Department of Civil Engineering

Vision: “To impart quality technical education beneficial to industry and the society in the field of Civil Engineering.”.

- **Mission:**
 - To arrange academic and technical expertise.
 - To improve the practical knowledge of the student as per current scenario of industry.
 - To make the students socially and ethically responsible.

Assignment No :- 06

Subject : Maths

Topic Name :- Numerical Integration

Q.1)

Using Trapezoidal rule, evaluate $\int_0^6 \frac{1}{\sqrt{x+1}} dx$ from the following data:

x	0	1	2	3	4	5	6
$y = \frac{1}{\sqrt{x+1}}$	1	0.7071	0.5773	0.5	0.4472	0.4082	0.3780

Q.2)

Evaluate $\int_0^2 e^{-x} dx$ using Trapezoidal rule for the following data:

x	0	1/2	1	3/2	2
$y = e^{-x}$	1	0.6064	0.3676	0.2231	0.1353

Q.3)

Evaluate $\int_{1.4}^{2.2} y \, dx$ by Simpson's $\frac{1}{3}$ rule from the following table.

x	1.4	1.6	1.8	2.0	2.2
y	4.0552	4.953	6.0436	7.3891	9.025

Q.4)

Evaluate $\int_0^1 \frac{1}{1+x^2} \, dx$ by Simpson's $\frac{3}{8}$ rule taking $h = \frac{1}{6}$.

Q.5)

Evaluate $\int_0^{\pi/2} \sqrt{\sin x} \, dx$ using Simpson's $\frac{3}{8}$ rule with six equal intervals.

Date of Submission :-

Assign By :- Ms.Nasreen Ansari