



Answer ALL questions
(The figures in the right hand margin indicate marks)

PART – A

(2 x 5 = 10 Marks)

Q.1. Answer *all the* questions

- | | CO # | Blooms
Level |
|---|------|-----------------|
| a. Define Matrices and its order. | CO1 | K1 |
| b. Evaluate $\int (x + 1)^2 dx$. | CO2 | K1 |
| c. Write down the general equation of Circle and straightline. | CO3 | K2 |
| d. Define Scalar and Vector. | CO4 | K2 |
| e. Find the order of the Differential equation $\left(\frac{d^2y}{dx^2}\right)^4 + \left(\frac{dy}{dx}\right)^3 - 6y = 0$ | CO5 | K1 |

PART – B

(10 x 5 = 50 Marks)

Answer **ANY TWO (a, b OR c, d)** from all the questions below

- | | Marks | CO # | Blooms
Level |
|--|-------|------|-----------------|
| 2. a. Solve by Cramer's Rule $x + y + z = 6, 2x - y + z = 3, x + 2y - z = 3$ | 5 | CO1 | K2 |
| b. Expressing a matrix as the sum of Symmetric Matrix and Skew-Symmetric Matrix
$\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$ | 5 | CO1 | K3 |
| (OR) | | | |
| c. Find the Inverse of the matrix $A = \begin{bmatrix} 1 & 0 & 5 \\ 2 & 1 & 6 \\ 3 & 4 & 0 \end{bmatrix}$. | 5 | CO1 | K2 |
| d. Find $A + B, A - B, 2A + B, A - 2B, 5A + 2B$.
where $A = \begin{bmatrix} 2 & 3 & 4 \\ 1 & 3 & 4 \\ 3 & 2 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & 1 & 5 \\ 4 & 3 & 0 \\ 3 & 2 & 4 \end{bmatrix}$. | 5 | CO1 | K3 |
| 3.a. Find i. $\int (\sin 2x + \cos 4x) dx$ ii. $\int (5e^{5x} + 3a^{4x}) dx$ | 5 | CO2 | K2 |
| b. Find i. $\int (x^{\frac{3}{2}} + x + 1) dx$ ii. $\int (\sqrt{x} + \frac{1}{\sqrt{x}}) dx$ | 5 | CO2 | K3 |
| (OR) | | | |
| c. Find i. $\int 2x \sin(1 + x^2) dx$ ii. $\int \frac{\sin(\tan^{-1} x)}{1+x^2} dx$ | 5 | CO2 | K2 |
| d. Find $\int \frac{dx}{(x+1)(x+2)}$. | 5 | CO2 | K3 |
| 4.a. Find the equation of straight-line whose sum of intercept is 14 at point (3,4). | 5 | CO3 | K2 |
| b. Find the equation of a circle passing through points (1,2) and (3,4). | 5 | CO3 | K3 |
| (OR) | | | |
| c. Find the equation of a straight line passing through points (3,5) and (1,4). | 5 | CO3 | K2 |
| d. Find the equation of a circle passing through the centres (1,2) and radius 5. | 5 | CO3 | K3 |
| 5.a. Find the unit vector of the following. | 5 | CO4 | K2 |
| i. (2,3,4) ii. (1,1,1) | | | |
| b. Find the area of the parallelogram (1,2,3) and (2,1,3). | 5 | CO4 | K3 |
| (OR) | | | |
| c. Find the angle between two vectors (2,3,4) and (2,4,3). | 5 | CO4 | K2 |

- d. Find $\vec{c} + \vec{a}, \vec{c} - \vec{b}, 2\vec{c} + 3\vec{a}, 4\vec{a} + 3\vec{b}$. $\vec{a} = (1,3,5), \vec{b} = (2,4,5)$
and $\vec{c} = (2,2,1)$. 5 CO4 K3
- 6.a. Find the general solution of the differential equation $\frac{dy}{dx} = \frac{\sin y}{\cos x}$. 5 CO5 K2
- b. Verify that the function $y = xe^x$ is a solution of the differential equation
 $\frac{d^2y}{dx^2} + 2\frac{dy}{dx} + y = 0$ 5 CO5 K3
- (OR)
- c. Find the general solution of the differential equation $\frac{dy}{dx} = \frac{1+y^2}{1+x^2}$. 5 CO5 K2
- d. Verify that the function $y = e^{-3x}$ is a solution of the differential equation
 $\frac{d^2y}{dx^2} + \frac{dy}{dx} - 6y = 0$. 5 CO5 K3

--- End of Paper ---