DEPARTMENT OF MATHEMATICS
UNIVERSITY COLLEGE OF ENGINEERING (A)
Osmania University, Hyderabad-07

CLASS TEST-I

MATHEMATICS – II

(Common to all branches)

Class: B.E
Semester: II
Academic Year: 2021-2022

Max Marks: 20
Duration: 1 HOUR
Date: 16 -06-2022

		Marks	BT	CO
	PART A **Answer All Questions (6 M)**			
1. a)	Define Rank of a Matrix. If $A = \begin{bmatrix} 1 & 2 & 3 \\ 1 & 4 & 2 \\ 2 & 6 & 5 \end{bmatrix}$ then find rank of A	2	L1	1
b)	Find the Nature of Quadratic form $2xy + 2yz + 2zx$	2	L2	1
c)	What is an Integrating factor of $(1 + xy)y\,dx + (1 - xy)xdy = 0$	2	L2	2
	PART B **Answer Any Two Questions (14 M)**			
2. a)	Define Cayley – Hamilton Theorem and find the characteristic equation of the matrix $A = \begin{bmatrix} 1 & 1 & 3 \\ 1 & 3 & -3 \\ -2 & -4 & -4 \end{bmatrix}$ and hence find its inverse.	4	L2	1
b)	Solve : $\frac{dy}{dx} + y\,cotx = cosx$	3	L3	2
3. a)	Test for consistency and solve : $5x + 3y + 7z = 4, 3x + 26y + 2z = 9, 7x + 2y + 10z = 5$	4	L2	1
b)	Find the Orthogonal trajectories of the family of curves $r^n = a\,sinn\theta$	3	L3	2
4. a)	Let $A = \begin{bmatrix} 6 & -2 & 2 \\ -2 & 3 & -1 \\ 2 & -1 & 3 \end{bmatrix}$ Find matrix P such that $P^{-1}AP$ is diagonal matrix.	4	L1	1
b)	Solve : $\frac{dy}{dx} + y = 3\,e^x y^3$	3	L2	2

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