Code No: **R201109** **R20** **SET - 1**

I B. Tech I Semester Supplementary Examinations, July/August-2023

MATHEMATICS-II

(Only Electrical and Electronics Engineering)

Time: 3 hours Max. Marks: 70

Answer any five Questions one Question from Each Unit
All Questions Carry Equal Marks

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UNIT-I

1. a) Test the consistency of the system $x-3y-8z=-10, 3x+y-4z=0, 2x+5y+6z=13$ hence solve. [7M]

   b) Solve the system of equations $2x+y+2z+w=6, 6x-6y+6z+12w=36, 4x+3y+3z-3w=-1, 2x+2y-z+w=10.$ by Gauss elimination method. [7M]

(OR)

2. a) Prove that the product of Eigen values of a matrix is the determinant of the matrix. [7M]

   b) Solve the system of equations $x+y-3z+2w=0, 2x-y+2z-3w=0, 3x-2y+z-4w=0, -4x+y-3z+w=0.$ [7M]

UNIT- II

3. a) Verify Cayley Hamilton theorem for $A=\begin{bmatrix}-2 & 3 & 1\\ 0 & -1 & 5\\ -1 & 4 & 0\end{bmatrix}$, hence compute A^{-1} [7M]

   b) Find the Nature of the quadratic form $6x^2+35y^2+11z^2-4xz$ [7M]

(OR)

4. Reduce the quadratic form $3x^2+3y^2+3z^2-2yz+2zx+2xy$ in to canonical form by orthogonal reduction hence find rank, index and signature. [14M]

UNIT- III

5. a) Find the real root of the equation using $-x+logx_{10}+3=0$ Newton Raphson method [7M]

   b) Find the real root of the equation using $x^2+4sinx=0$ using False-position method [7M]

(OR)

6. a) Find the real root of the equation using $sinx=\frac{x}{2}$ iteration method [7M]

   b) Find the real root of the equation using $4x=4sinx+1$ bisection method [7M]

UNIT- IV

7. a) Find $\Delta^2[3^{2x+5}]$ if h =1 [7M]

   b) Find the Lagrange' s polynomial for the following data [7M]

x	1	2	7	8
y	1	5	5	4

(OR)

8. Find population of a town for the year 1913 and 1965, given that [14M]

year	1911	1921	1931	1941	1951	1961
population	10	16	22	28	40	55
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UNIT- V

9. Evaluate $\int_0^8 xsecxdx$ using [14M]
(i) Trapezoidal
(ii) Simpson's 1/3rd rule
(iii) Simpson's 3/8th rule and compare with exact result.

(OR)

10 a) By Runge kutta method of fourth order find y (0.1) given that [7M]
$\frac{dy}{dx} = 2x + 3e^x, y(0) = 0.$

b) By Picard's method find y(0.1) given that $\frac{dy}{dx} = x + y^2, y(0) = 1$ [7M]

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