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SECTION - B (35 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks

(5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Compute the rank of the matrix $A = \begin{pmatrix} 1 & 2 & 3 \\ 2 & 4 & 6 \\ 1 & 1 & 1 \end{pmatrix}$	K2	CO1
		(OR)		
	11.b.	Give the eigenvalues and eigenvectors of $A = \begin{pmatrix} 4 & 1 \\ 3 & 2 \end{pmatrix}$		
2	12.a.	Solve $\frac{dy}{dx} + y = e^{-x}$, $y(0)=1$	K3	CO2
		(OR)		
	12.b.	Find $L\{\cos 3t \cdot e^{-2t}\}$		
3	13.a.	Use Gauss Elimination to solve the equations $3x - y + 2z = 12$; $x + 2y + 3z = 11$; $2x - 2y - z = 2$	K3	CO3
		(OR)		
	13.b.	Solve the given equations by Gauss Jacobi iteration method $27x + 6y - z = 85$; $6x + 15y + 2z = 72$; $x + y + 54z = 110$		
4	14.a.	Find the first and second derivatives of the function $x=1.5$ from the following X:1.5 2.0 2.5 3.0 3.5 4.0 Y:3.375 7.0 13.625 24.0 38.875 59.0	K3	CO4
		(OR)		
	14.b.	Evaluate $\int_{-3}^3 x^4 dx$ by Trapezoidal Rule.		
5	15.a.	Use Euler's method with step size $h = 0.2$ to approximate $y(0.4)$, given $\frac{dy}{dx} = y - x^2$, $y(0) = 1$	K2	CO5
		(OR)		
	15.b.	Approximate $y(0.4)$ using RK2 with $h = 0.2$, given: $\frac{dy}{dx} = x^2 + y$, $y(0) = 1$		

SECTION - C (30 Marks)

Answer ANY THREE questions

ALL questions carry EQUAL Marks (3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Compute the Eigen value and Eigen vector of $\begin{pmatrix} 2 & 1 & 1 \\ 1 & 2 & 1 \\ 0 & 0 & 1 \end{pmatrix}$	K2	CO1
2	17	Solve $y'' - 2y' + 2y = e^x$, $y(0)=0$, $y'(0)=1$	K3	CO2
3	18	Apply Gauss Jordan method to solve the equations $x - y + z = 1$; $-3x + 2y - 3z = -6$; $2x - 5y + 4z = 5$	K3	CO3
4	19	The population of a certain town is given below find the rate of growth of the population in 1931 and 1941 Year x : 1931 1941 1951 1961 1971 Population in '000 y: 40.62 60.80 79.95 103.56 132.65	K3	CO4
5	20	Use Modified Euler method, find $y(0.2)$ for $\frac{dy}{dx} = x^2 + y^2$, $y(0) = 1$	K2	CO5