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RAJU

ENGINEERING

[M19CAD1103]

I M. Tech I Semester (R19) Regular Examinations COMPUTATIONAL METHODS IN ENGINEERING Department of Mechanical Engineering MODEL QUESTION PAPER

TIME: 3Hrs.

Max. Marks: 75 M

Answer ONE Question from EACH UNIT.

All questions carry equal marks.

		CO	KL	Μ
	UNIT-I			
1.	Solve using gauss – Jordan elimination	1	3	15
	$\mathbf{x} - \mathbf{y} + 2\mathbf{z} = -8$			
	$\mathbf{x} + \mathbf{y} + \mathbf{z} = -2$			
	2x-2y+3z = -20			
	OR			
2.	Fit a curve of the form $y = ax^{b}$ for the following data:	1	3	15
	x 1 2 3 4 5			
	Y 0.5 2 4.5 8 12.5			
	UNIT-II			
3.	 Using Shooting method, solve the BVP $y'' + y + x = 0$, $0 < x < 1$, $y(0) = 0$	2	3	15
	and $y(1) = e^{-1}$.			
	OR			
4.	Solve the heat conduction equation, $u_{xx} - u_t = 0$, subject to bndary	2	3	15
	conditions $u(0,t) = u(1,t) = 0$ and $u(x,0) = x - x^2$. Take $h = 0.25$ and $k = 0.25$			
	0.025.			
	S			
	UNIT-III			
5.	Explain FFT by taking a suitable example.	3	2	15
	OR			
6.	Explain DFT by taking a suitable example.	3	2	15
	UNIT-IV			
7.	Solve the Poisson equation $A^2 = -15(x^2 + y^2 + 15)$ subject to the	4	3	15
	condition $u = 0$ at $x = 0$ and $x = 3$ $u = 3$ $u = 0$ at $y = 0$ and $u = 1$ at $y = 3$			
	for $o < x < 3$. Find the solution taking $h = 1$ with a square.			
	OR			
8.	Solve $4u_{xx} = u_{tt} u(0,t) = 0 y(4,t) = 0$	4	3	15
	$u_t(x,0) = 0$ and $u(x,0) = x(4-x)$.			
	UNIT-V			
9.	 Solve $u_{xx} + u_{yy} = 0$, $0 \le x$, $y \le 1$, with $u(0,y) = 10 = u(1,y)$ and $u(x,0) = 20$	5	3	15
	= $u(x,1)$. Take $h = 0.25$ and apply Liebmann method to 3 decimal			
	 accuracy.			



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		OR			
10.		Explain the procedure for solving wave equation by finite difference method.	5	2	15
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