

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	M												
		UNIT-I															
1.		Solve using gauss – Jordan elimination $x - y + 2z = -8$ $x + y + z = -2$ $2x - 2y + 3z = -20$	1	3	15												
		OR															
2.		Fit a curve of the form $y = ax^b$ for the following data: <table border="1" data-bbox="539 1088 994 1171"> <tr> <td>x</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr> <tr> <td>Y</td><td>0.5</td><td>2</td><td>4.5</td><td>8</td><td>12.5</td></tr> </table>	x	1	2	3	4	5	Y	0.5	2	4.5	8	12.5	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 $y'' + y + x = 0$, $0 < x < 1$, $y(0) = 0$ and $y(1) = e - 1$.	2	3	15												
		OR															
4.		Solve the heat conduction equation, $u_{xx} - u_t = 0$, subject to boundary conditions $u(0,t) = u(1,t) = 0$ and $u(x,0) = x - x^2$. Take $h = 0.25$ and $k = 0.025$.	2	3	15												
		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 $\nabla^2 u = -15(x^2 + y^2 + 15)$ subject to the condition $u = 0$ at $x = 0$ and $x = 3$ $u = 3$ at $y = 0$ and $u = 1$ at $y = 3$ for $0 < x < 3$. Find the solution taking $h = 1$ with a square.	4	3	15												
		OR															
8.		Solve $4u_{xx} = u_{tt}$ $u(0,t) = 0$ $y(4,t) = 0$ $u_t(x,0) = 0$ and $u(x,0) = x(4-x)$.	4	3	15												
		UNIT-V															
9.		Solve $u_{xx} + u_{yy} = 0$, $0 \leq x, y \leq 1$, with $u(0,y) = 10 = u(1,y)$ and $u(x,0) = 20 = u(x,1)$. Take $h = 0.25$ and apply Liebmann method to 3 decimal accuracy.	5	3	15												



		OR			
10.		Explain the procedure for solving wave equation by finite difference method.	5	2	15
CO-CRSE TCOME		KL-KNOWLEDGE LEVEL	M-MARKS		

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