R09

Code No: 56083

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, November/December - 2020
NUMERICAL METHODS
(Automobile Engineering)

Time: 2 hours **Max. Marks: 75**

Answer any five questions
All questions carry equal marks
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1.a) Solve the following by iteration method: $x^3 + x^2 = 1$.
b) Find a root of the equation xsinx + cosx = 0 using Newton Raphson method. [7+8]

2. Solve the equations 5x – y = 9, -x + 5y + z = 4, y – 5z = 6 by Jacobi's method. [15]

3.a) Find y (6) if y (1) = 4, y (2) =5, y (7) = 5 and y (8) = 4 using Lagrange's interpolation formula.
b) Obtain the cubic spline for the following data: [7+8]

x	0	1	2	3
y	2	-6	-8	2

4. Fit a curve of the form $y = a e^{bx}$ to the given data: [15]

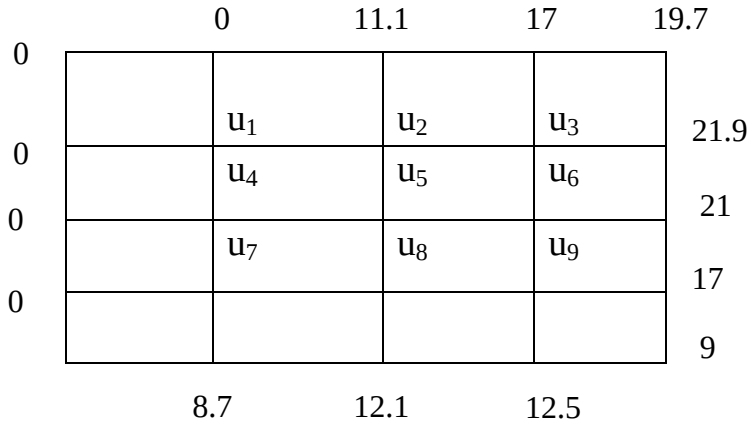
x	1	2	3	4	5
y	7.1	27.8	62.1	110	161

5. Derive Newton-Cote's quadrature formula and hence deduce Trapezoidal rule. [15]

6. Evaluate $\int_0^3 \cos^2 x dx$, by Simpson's 1/3 and 3/8 methods. [15]

7. Use Taylor's Series method to solve the differential equation $\frac{dy}{dx} = \frac{1}{x^2 + y}$, y(4) = 4 and compute y (4.2) and y(4.4) taking h = 0.2. [15]

8. Solve the Laplace equation $u_{xx} + u_{yy} = 0$ given that [15]



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