Reg. No										

AY 24

GANDHI INSTITUTE OF ENGINEERING AND TECHNOLOGY, ODISHA, GUNUPUR

(GIET UNIVERSITY)

M. Sc. (First Semester - Regular) Examinations, February – 2025

24MTPC1003 - NUMERICAL ANALYSIS

Time: 3 hrs | Maximum: 60 Marks

Answer ALL questions

(The figures in the right hand margin indicate marks)

PART – A **(2 x 5 = 10 Marks)**

Q.1. Answer ***ALL*** the questions	CO #	Blooms Level
a. What is the formula for Regula-Falsi Method.	C01	K1
b. Find the Lagrange's interpolating polynomial of the data f(0)=1 ,f(1)=3 ,f(3)=55	C02	K2
c. Write the Formula for Simpson's Three-Eight rule	C01	K1
d. What is the Disadvantage of Multistep Method	C02	K1
e. Explain about Classification of PDE With an example	C02	K2

PART – B **(10 x 5 = 50 Marks)**

Answer ***ALL*** the questions	Marks	CO #	Blooms Level
2.a. Find a Root of an Equation of $x^3 = 6x-4$. Correct up to 2 decimal places by using Bisection method.	5	C03	K3
b. Solve 4x+2y+z=14, x+y+8z=20, x+5y-z=10 by using Gauss -Seidel Method .	5	C04	K3
(OR)			
c. Find a Root of cosx=3x-1 correct up to 3 decimal places by Fixed Point Iteration Method.	5	C03	K3
d. Solve the system by LU Decomposition Method 3x-6y-3z=-3 , 2x+6z=-22, -4x+7y+4z=3.	5	C04	K3
3.a. Estimate f(-0.5) and f(0.5) by Hermite Interpolation Formula, From the given data	10	C03	K3

x	-1	0	1
F(x)	1	1	3
F'(x)	-5	1	7

(OR)

b. Obtain the Piecewise Linear Interpolation for the function f(x).Also find f(7)	10	C03	K3

X	1	2	4	8
Y=f(x)	3	7	21	73

4.a. Evaluate $I=\int_0^1 \frac{1}{1+x}$ dx by Simpson rule & Romberg's method	10	C04	K3
(OR)			
b. Evaluate $f^1(3)$ by Richardson's Extrapolation method & Central Difference formula, From the following table	10	C04	K3

x	1	2	3	4	5	6
f(x)	1	16	81	256	625	2401

5.a. Estimate y (0.4) for the Initial value problem $y^1 = -2xy^2$ & y(0)=0. by Milne-Simson's predictor- Corrector formula	10	C05	K3
(OR)			
b. Using Range –Kutta Method (R-K METHOD)	10	C05	K3

Find y(0.2) and y(0.4) Given $y^1 = x + y, y(0) = 1$

6.a.	Solve the Equation $U_{xx} = U_t$ subject to U (x,0) =0; U (0,t)= 0 & U (1,t)=t for two time steps , by Crank –Nicholson Method	10	C06	K3
	(OR)			
b.	Solve $U_{xx} = 2U_t$ Given U (x,0) =0 ; U (0,t)= 0 & U (1,t)=t & U(x,0)=x(x-4).find the values of U up to t=5 assume h=1 by Bender-Schmidt Formula	10	C06	K3

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