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Gandhi Institute of Engineering and Technology University, Odisha, Gunupur
(GIET UNIVERSITY)

M.Sc. (First Semester - Regular) Examinations, January – 2026

24MPCMA11003 – Numerical Analysis

(Mathematics)

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*** questions

		CO #	Blooms Level
a.	What is the formula for Fixed point Iteration Method.	CO1	K1
b.	Find the Lagrange's interpolating polynomial of the data f(0)=1 ,f(1)=3 ,f(3)=55	CO2	K1
c.	Write the Formula for Simpson's Three-Eight rule	CO3	K1
d.	What is the Disadvantage of Multistep Method	CO4	K2
e.	Explain about Classification of PDE With an example	CO5	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 Bisection method.	5	C01	K3
b.	Find a Root of cosx=3x-1 correct up to 3 decimal places by Newton –Raphson Method.	5	C01	K3
	(OR)			
c	Solve 4x+2y+z=14, x+y+8z=20, x+5y-z=10 by using Gauss -Seidel Method.	10	C01	K3
3.a.	Estimate f (-0.5) and f (0.5) by Hermite Interpolation Formula, From the given data	10	C02	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	C02	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	C03	K3
	(OR)			
b.	Evaluate $f'(3)$by Richardson's Extrapolation method & Central Difference formula, From the following table	10	C03	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' = xy+ y^2 & y (0) =1. By Adam's predictor- Corrector method	10	C04	K3
	(OR)			

b.	Using Range –Kutta Method (R-K Method) Find y(0.2) and y(0.4) Given $y' = x + y, y(0) = 1$	10	C04	K3
6.a.	Solve the Equation $U_{xx} = U_t$ subject to U (x,0) =0; U (0,t)= 0 & U (1,t)=1 for two time steps , by Crank –Nicholson Method.	10	C05	K3
	(OR)			
b.	Solve $U_{xx} = 2U_t$ Given U (0,t)= 0 & U (4,t)=0 & U(x,0) =x(4-x). find the values of U up to t=5. assume h=1 by Bender-Schmidt Formula	10	C05	K3

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