Question Paper Code: R15A21HS01

R15

ANURAG Engineering College

(An Autonomous Institution)

II B.Tech. I Semester Supplementary Examinations, June/July – 2024

MATHEMATICS-III

(COMMON TO CIVIL & MECH)

Time: 3 Hours **Max. Marks: 75**

Section – A (Short Answer type questions) (25 Marks)

Answer All Questions

		Course Outcome	B.T Level	Marks
1.	What is Algebraic and transcendental function? Give an example	CO1	L1	2M
2.	If $x^2 - x - 1 = 0$ by bisection method first two approximations are 1 and 2 then the third approximation is?	CO1	L2	3M
3.	State Lagrange`s Interpolation formula.	CO2	L1	2M
4.	Evaluate $\Delta^2 \cos 2x$	CO2	L2	3M
5.	State the formula for Trapezoidal rule.	CO3	L1	2M
6.	State the formula for Simson's 1/3 rule.	CO3	L1	3M
7.	write Mathematical steps of Picard's method.	CO4	L1	2M
8.	Write the Runge- kutta formula to find solution of ordinary differential equation	CO4	L1	3M
9.	Form the PDE by eliminating the constants c and d from z=(x+c)(y+d).	CO5	L2	2M
10.	Find $\frac{\partial z}{\partial x}$ for $z= x^3-2xy^2-4y^3$.	CO5	L2	3M

Section B (Essay Questions)

Answer all questions, each question carries equal marks. **(5 X 10M = 50M)**

11. A)	Find a real root of $\cos x = xe^x$ by Regula Falsi method correct to five decimal places	CO1	L3	10M
	OR			
B)	Sove the following equation by Gauss seidal method $2x + y + z = 10, 3x + 2y + 3z = 18, x + 4y + 9z = 16$	CO1	L3	10M
12. A)	Find y(1.6) using Newton's forward difference formula from the table	CO2	L3	10M

X	1	1.4	1.8	2.2
y	3.49	4.82	5.96	6.5

OR

B)	Find y(10) using Lagrange's interpolation formula:	CO2	L3	10M

x	5	6	9	11
y	12	13	14	16

13. A)	Determine the constants a and b by the method of least squares such that $y=ae^{bx}$.	CO3	L3	10M

x	1	2	3	4	5
y	2	6	7	8	10

OR

B)	Evaluate $\int_0^2 \frac{x^2}{1+x^3}dx$ using *simpson's* $\frac{1}{3}$ rule with h=0.2.	CO3	L3	10M
14. A)	Solve $y^1 = y^2+x$,given y(1)=0.Find y(1.1) and y(1.2) by Taylor's series method	CO4	L3	10M
	OR			
B)	Use Runge-kutta method to evaluate y(0.1) and y(0.2) given that $y^I = x+y$, y(0)=1.	CO4	L3	10M
15. A)	Solve $q+xp=p^2$ by Charpit's Method	CO5	L3	10M
	OR			
B)	Solution of a PDE by the method of separation fo variables $u_{xx}-u=0$	CO5	L3	10M