Reg. No ..... Name **26P452**

M. Sc. DEGREE END SEMESTER EXAMINATION - MARCH 2026

SEMESTER 4 : MATHEMATICS

COURSE : **24P4MATT19EL : NUMERICAL ANALYSIS WITH PYTHON 3**

(For Regular 2024 Admission)

Time : Three Hours Max. Weights: 30

PART A

Answer any 8 questions **Weight: 1**

1. Define I_2 recurssively. (R)
2. How to find limit of a function using Python. (R)
3. What is the error evaluated in Trapezoidal rule? (R)
4. Define third divided difference. (U)
5. Calculate $\int_0^3 xdx$ using Python codes. (A)
6. Create a label x that refers to 2 and compute 2x+1 using python code. (A)
7. Identify the result of the following codes
   >>>$p = 3 * y * (y + 2 * y) + 4 * y^2$
   >>>p
   >>y = 1
   >>p (A)
8. What is meant by curve fitting? Represent graphically. (R)
9. What is the formula for Lagrange inverse interpolation formula? (R)
10. Write a program to find the partial differential equation of a function f(x,y). (U)

(1 x 8 = 8)

PART B

Answer any 6 questions **Weights: 2**

11. Explain the method to solve polynomial inequality using python codes. (R)
12. Write a program to find the length of the curve $f(x) = 2x^2 + 3x + 1$from $A(-5, 36)$ to $B(10, 231)$ and explain the same. (A)
13. Explain Newton Cotes formula. (U)
14. If $y_1 = 4, y_3 = 12, y_4 = 19, y_x = 7$. Find x. (A)
15. Briefly explain Bisection method. (U)
16. Use Python program to substitute values of the variable x and y in an expression f(x,y) and evaluate the same. (U)
17. Explain derivative calculator program. (A)
18. Evaluate $\int_0^\pi Sinxdx$ using trapezoidal rule with 16 panels. (A)

(2 x 6 = 12)

PART C

Answer any 2 questions **Weights: 5**

19. Use bisection method to find the root $x^3 - 10x^2 + 5 = 0$ that lies in the interval (0,1) to three digit accuracy. (A)
20. Define rate of change and explain instantaneous rate of change using Python. (U)

21.	Explain the method of solving quadratic equation, system of linear equation and solving one variable in terms of the other.	(U)
22.	Explain LU decomposition method.	(R)

(5 x 2 = 10)

OBE: Questions to Course Outcome Mapping

CO	Course Outcome Description	CL	Questions	Total Wt.

Cognitive Level (CL): Cr - CREATE; E - EVALUATE; An - ANALYZE; A - APPLY; U - UNDERSTAND; R - REMEMBER;