Roll.No. | | 24UMAET6A02

SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN
(AUTONOMOUS)
(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai - 600 044.
B.Sc Mathematics- END SEMESTER EXAMINATIONS - NOVEMBER 2025
SEMESTER - VI
24UMAET6A02 - Numerical Methods

Total Duration : 2 Hrs.30 Mins. Total Marks : 60

Section B

Answer any **SIX** questions $(6 \times 5 = 30$ Marks)

1. Find the real root of the equation cos x = 3x - 1, using iteration method.
2. Solve by Gauss – Elimination method
   x+y+z=9;
   2x-3y+4z=13;
   3x+4y+5z=40.
3. Find the function f(x) from the following table hence evaluate f(6) by Newton's method.

x	1	2	7	8
y	1	5	5	4

4. Compute f'(0) and f''(4) from the following data.

x	0	1	2	3	4
f(x)	1	2.718	7.381	20.086	54.598

5. Using Euler's method, Solve numerically the equation, y' = x+y, y(0)=1, for x=(0.0),(0.2),(1.0).
6. Explain the condition for convergence of newton - Raphson method.
7. Write the properties of Forward, Backward and Central difference operators.
8. Using Lagrange's interpolation formula find y(10) from the following table.

x	5	6	9	11
y	12	13	14	16

Section C

Answer any **THREE** questions $(3 \times 10 = 30$ Marks)

9. Find the real root of the equation $x^3 - 5x - 6 = 0$, using Regula Falsi method

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10. Solve the system of equations
    4x+2y+z=14;
    x+5y-z=10;
    x+y+8z=20, using Gauss Seidal method.

11. From the data given below, find the value of x when y=13.5

x	93.0	96.2	100.0	104.2	108.7
y	11.38	12.80	14.70	17.07	19.91

12. Evaluate I $= \int_0^6 \frac{1}{1-x} dx$

    using (i) Trapezoidal rule
    (ii) Simpson's one-third rule
    (iii) Simpson's three by eighth rule.

13. Find the value of y(1.1) using runge kutta method of fourth order given that dy/dx $= y^2 + xy$; y(1)=1.

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