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. CS with CGS - END SEMESTER EXAMINATIONS APRIL - 2024
SEMESTER - II
21UCGAT2002 - 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 x^3-3x + 1 = 0 lying between 1 and 2 upto three decimal places by Newton Raphson method.
2. Estimate the missing term in the following table.

x:	0	1	2	3	4
u(x)	1	3	9	-	81

   Explain why the resulting value differs from 3^3.
3. If y(75) = 246, y(80) = 202, y(85)=118, y(90)=40. Find y (79).
4. Find the form of the function y for the following data. Hence find y(3).

x	0	1	2	5
y	2	3	12	147

5. Evaluate $\int_0^5 \frac{dx}{4x+5}$ by Trapezoidal rule using 11 coordinates.
6. Explain any three properties of the operator Δ
7. Find a cubic polynomial which take the following values.

x	0	1	2	3
y	1	2	1	10

8. Find the value of $\int_0^1 \frac{x^2}{1+x^3}dx$ using Simpson's $\frac{1}{3}$ rule with h = 0.25.

Section C

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

9. Find a real root of the equation x^3- x - 11 = 0 by using bisection method.
10. i) Find the sixth term of the sequence 2, 6,12 ,20,30.....

    ii) Explain the difference between $\left(\frac{\Delta^2}{E}\right) f(x)$ and $\frac{\Delta^2 f(x)}{Ef(x)}$ and find the values of these when $f(x) = x^2$

Contd...

11. The following data given the melting point of an alloy of zinc and lead Q, the temperature and x is the percentage of lead. using Newton's inerpolation formula find (i) θ when x = 48 (ii) θ when x = 84.

x	40	50	60	70	80	90
θ	184	204	226	250	276	304

12. Find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ at x = 51 from the following data.

x	50	60	70	80	90
y	19.96	36.65	58.81	77.21	94.61

13. Evaluate $\int_0^1 \frac{dx}{1+x}$ using
    (i) Trapezoidal rule
    (ii) Simpson's rule.

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