

Roll.No.

21UCGAT2002

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 - NOVEMBER 2025
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 positive root of $f(x) = 2x^3 - 3x - 6 = 0$ by Newton- Raphson method correct to five decimal places.
2. From the following table find $f(x)$ and hence $f(6)$ using Newton's divided difference interpolation formula

x:	1	2	7	8
f(x):	1	5	5	4

3. Find $\frac{dy}{dx}$ when $x=0.5$ for the following data

x:	0	1	1	3	4
y:	1	1	15	40	85

4. Using Taylor method compute $y(0.2)$ correct to 4 decimal places given $\frac{dy}{dx} = 1 - 2xy$ and $y(0)=0$.
5. a) Evaluate $\Delta \log f(x)$ b) Prove that $E = e^{hD}$.
6. Use Lagrange's inverse interpolation formula to find the value of x when $y=19$

x:	2	1	2
y:	0	1	20

7. Evaluate $\int_0^{10} \frac{dx}{1+x^2}$ using trapezoidal rule.
8. Using Euler's method , solve $y' = x + y, y(0) = 1$ for $x = 0.2$

Contd...

Section C

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

9. Find the positive root of $x^3 - x = 1$ correct to four decimal places by bisection method.
10. The population of a town is as follows:

Year x:	1941	1951	1961	1971	1981	1991
Population in lakhs y:	20	24	29	36	46	51

Estimate the population increase during the period 1946.

11. Using Lagrange's formula for interpolation find $f(9.5)$ given

x:	7	8	9	10
y:	3	1	1	9

12. Evaluate $\int_0^1 \frac{dx}{1+x^2}$ using Simpson's three-eighth rule.
13. Apply the fourth order Runge- kutta method to find $y(0.1)$ given that $y' = x + y, y(0) = 1$
