

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.Computer Science - END SEMESTER EXAMINATIONS - APRIL 2025
SEMESTER - II

20UCSAT2002 - Allied Mathematics - II

Total Duration : 2 Hrs.30 Mins.

Total Marks : 60

Section B

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

- Find the positive root of $x^4 - x = 10$, correct to three decimal places using Newton-Raphson method.
- Find forward difference table for the given data:

X	100	150	200	250	300	350	400
Y	10.63	13.03	15.04	16.81	18.42	19.90	21.27

- Using Newton's forward formula, find the value of $f(1.6)$, if

X	20	23	26	29
f(x)	0.3420	0.3907	0.4384	0.4848

- Find the polynomial $f(x)$ by using Lagrange's formula and hence find $f(3)$ for

X	0	1	2	5
f(x)	2	3	12	147

- Use Simpson's $1/3^{rd}$ rule to find $\int_0^{0.6} e^{-x^2} dx$ by taking seven order ordinates.

- Prove that:

a) $\Delta = E - 1$

b) $\nabla = 1 - E^{-1}$

c) $\delta = E^{1/2} - E^{-1/2}$

- Explain Regula - False method

- Given that

X	0	5	10	15	20
Y	0	3	14	69	228

Find $\frac{dy}{dx}$ at $x = 0$ (using Newton's forward formula).

Contd...

Section C

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

9. Find a root of the equation $x^3 - 4x - 9 = 0$, using the bisection method correct to three places.

10. Find the missing term in the following table:

X	45	50	55	60	65
Y	3.0	-	2.0	-	-2.4

11. In the table below, find $x = 1$ and $x = 10$ of the series:

x	3	4	5	6	7	8	9
y	4.8	8.4	14.5	23.6	36.2	52.8	73.9

12. Find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ at $x = 1.1$, $x = 1.6$ for the following data:

X	1.0	1.1	1.2	1.3	1.4	1.5	1.6
Y	7.989	8.403	8.781	9.129	9.451	9.750	10.031

13. Evaluate $\int_0^6 \frac{dx}{1+x^2}$ by using

- i. Trapezoidal rule,
- ii. Simpson's 1/3 rule,
- iii. Simpson's 3/8 rule.
