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 NOVEMBER -2023
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)

1. Find the positive root of $x^3 - x = 1$ correct to 2 decimal places by bisection method
2. Find the 7^{th} term of the sequence 2,9,28,65, 126, 217 and also find the general term.
3. Using Lagrange's Interpolation formula, find , from the following table.

x	5	6	9	11
y	12	13	14	16

4. The population of a certain city is given below. Find $\frac{dy}{dx}$ at $x = 1931$

Year	x	1931	1941	1951	1961	1971
Population in thousands	y	40.62	60.80	79.95	103.56	132.65

5. Using Taylor series method find, correct to 3 decimal places, the value of $y(0.1)$ given $y' = x^2 + y^2$ and $y(0) = 1$
6. Using Newton Raphson method, find the root between 0 and 1 of $x^3 = 6x - 4$ correct to 5 decimal places
7. Compute y at $x = 0.4$ by Euler method given $y' = xy, y(0) = 1$
8. Show that $\triangle^3_{bcd}\left(\frac{1}{a}\right) = -\frac{1}{abcd}$

Section C

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

9. Solve for positive root of $x^3 - 4x + 1 = 0$ by Regula Falsi method
10. Find the value of y at $x = 21$ and $x = 28$, from the following data

x	20	23	26	29
y	0.3420	0.3907	0.4384	0.4848

Contd...

11. Using Newton's Divided difference formula, find the value of f(2), f(8) and f(15) from the table given below:

x	4	5	7	10	11	13
f(x)	48	100	294	900	1210	2028

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

    i. Trapezoidal rule

    ii. Simpson's $\frac{1}{3}$ rule

    iii. Simpson's $\frac{3}{8}$ rule

    Also, checkup by direct integration

13. Apply the fourth order Runge-Kulta method to find $y(0.2)$ given that $y' = x + y, y(0) = 1$

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