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 - NOV'2024
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 4 decimal places by bisection method.
2. Using Newton's forward difference formula, find $f(43)$

X	40	50	60	70	80	90
f(x)	184	204	226	250	276	304

3. Find a polynomial of degree four which takes the values

x:	2	4	6	8	10
y:	0	0	1	0	0

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

Year of Population x:	1931	1941	1951	1961	1971
In thousands y:	40.62	60.80	79.95	103.56	132.65

5. Solve $\frac{dy}{dx} = x + y$ given $y(1) = 0$ and get $y(1.1)$ by Taylor series method.
6. Evaluate $\int_0^1 \frac{dx}{1+x^2}$ using Trapezoidal rule with h=0.2. Hence, obtain an approximate value of π.
7. Solve the equation $\frac{dy}{dx} = -y$, $y(0) = 1$ and determine the value of y at $x =$ 0.01 and 0.02 using Euler's method.
8. Find the positive root of $f(x) = 2x^3 - 3x - 6 = 0$ by Newton Raphson method correct to five decimal places.

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.

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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

11. Using Lagrange's Interpolation formula, find $y(10)$, from the following table

x	5	6	9	11
y	12	13	14	16

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

    (i) Trapezoidal rule (ii) Simpson's $1/3^{rd}$ rule

    (iii) Simpson $3/8$ rule. Also check up 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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