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. END SEMESTER EXAMINATIONS NOVEMBER-2022
SEMESTER - II
20UCSAT2002 - Allied Mathematics-II

Total Duration : 2 Hrs 30 Mins. Total Marks : 60

Section A

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

1. Illustrate the positive root of the equation $x^3 + 4x^2 - 10 = 0$ by bisection method correct upto two places of decimal.
2. Sketch one real root of $3x = \cos x + 1$ by Newton Raphson method.
3. Construct a forward difference table from the following data

x	0	1	2	3	4
yx	1	1.5	2.2	3.1	4.6

Evaluate $\Delta 3y1$,yx , y5.

4. Prove that $\Delta\nabla = \Delta\nabla = \Delta - \nabla = \delta 2$
5. Construct a divided difference table for the following:

x	1	2	4	7	12
f(x)	22	30	82	106	216

6. Classify the first and second derivative for the following data at $x = 1.5$

x	1.5	2.0	2.5	3.0	3.5	4.0
f(x)	3.375	7.000	13.625	24.000	38.875	59.000

7. Compute the value of the integral by Trapezoidal rule.
$\int_0 .2^1 .4(sinx - log_e x + e^x)dx$
8. Discriminate Taylor's series method to find the solution of $\frac{dy}{dx} = x + y - 1$ with $y(1) = 2$ correct to five decimal places at $x = 1.02$.

Section B

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

9. Demonstrate $f(x) = x^3 - x - 1$ using regular falsi method.

Contd...

10. The following data gives - I, the indicated HP and V - the speed in knots developed by a ship.

V	8	10	12	14	16
I	1000	1900	3250	5400	8950

Using Newton's forward Interpolation formula, relate I when V $= 9$.

11. Given the values

X	5	7	11	13	17
f(x)	150	392	1452	2366	5202

Deduce f(9) using Lagrange's formula.

12. Solve the integral $\int_0^1 \frac{dx}{1+x^2}$ by using Simpson's $1/3$ rule and $3/8$ rule.

13. When $x = 0.1$ and $x = 0.2$, given that $x = 0$ when $y = 1$ and $\frac{dy}{dx} = x + y$?

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