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 APRIL-2023
SEMESTER - II
16UCSAT2MA2 - Allied Mathematics - II

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

Section B

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

1. Solve the equation $x^3 + x^2$ - 1 = 0 for the positive root by iteration method.
2. Assuming that a root of x^3 - $9x + 1 = 0$ lies in the interval (2, 4), find that root by bisection method.
3. Show that (i) ∇ = E-1 (ii) $\Delta = 1$ - E^{-1}
4. Construct Newton's divided difference table for the following values:

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

5. The population of a certain town is given below. Compute the rate of growth of the population in 1931.

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

6. Solve $\int_{-3}^{3} x^4 dx$ by using Trapezoidal rule.
7. Using Taylor series method, correct to four decimal places, predict the value of y(0.1), given $\frac{dy}{dx} = x^2 + y^2$ and y(0) = 1.
8. Given $y' = -y$ and y(0) = 1, determine the values of y at x = 0.01 to 0.04 with h = 0.01 by Euler method.

Section C

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

9. Solve an approximate root of $x\ log_{10}\ x$ - 1.2 = 0 by Regula –Falsi method.
10. From the following table of half-yearly premium for policies maturing at different ages, evaluate the premium for policies maturing at age 46 and 63.

Age x:	45	50	55	60	65
Premium y:	114.84	96.16	83.32	74.48	68.48

Contd...

11. From the data given below, Compute the value of x when y = 13.5.

x	93.0	96.2	100.0	104.2	108.7
y	11.38	12.80	14.70	17.07	19.91

12. (i) A rod is rotating in a plane. The following table gives the angle θ (in radians) through which the rod has turned for various values of time t (seconds). Evaluate the angular velocity and angular acceleration of the rod at t = 0.6 seconds.

t	0	0.2	0.4	0.6	0.8	1
Θ	0	0.12	0.49	1.12	2.02	3.20

(ii) Evaluate I=$\int_0^6 \frac{1}{1+x}dx$ using Simpson's one-third rule.

13. Determine y(0.3) given $\frac{dy}{dx} + y + xy^2$, y(0) = 1 by using h = 0.1 using R.K method of forth order.

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