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-2022
SEMESTER - II
20UCSAT2002 - Allied Mathematics-II

Total Duration : 3 Hrs. **Total Marks : 60**

Section A

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

1. Using Newton Raphson method, find the root between 0 and 1, $x^3 - 6x + 4$ correct to 5 decimal places.
2. Find the sixth term of the sequence 8, 12, 19, 29, 42.
3. Using Lagrange's formula of interpolation find y(9.5) given.

x	7	8	9	10
y	3	1	1	9

4. The population of a certain town is given below, find f'(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's series method, find y(0.1), y(0.2), given $\frac{dy}{dx} = x^2 - y$, y(0)=1 correct to 4 decimal places.
6. Solve the equation $x^3 + x^2 - 1 = 0$ for the positive root by iteration method.
7. Given y_3=2, y_4=-6, y_5=8, y_6=9 & y_7=17, calculate $\triangle^4 y_3$.
8. Evaluate $\int_0^6 (\frac{dx}{1+x^2})$ by Trapezoidal rule.

Section B

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

9. Solve for a positive root of $x^3 - 4x + 1 = 0$ by Regular false method.
10. The population of a town is as follows:

Year(x)	1941	1951	1961	1971	1981	1991
Population in lakhs (y)	20	24	29	36	46	51

By using Newton's forward interpolation, estimate the year x=1946.

11. From the following table find f(x) and hence find f(6), using Newton's divided difference formula,

x	1	2	7	8
f(x)	1	5	5	4

Contd...

12. Evaluate $\int_{-3}^{3} x^4 dx$, by using
    (i)Trapezoidal rule; (ii)Simpson's one-third rule; (iii) Simpson's Three eights rule.
13. Apply the fourth order Runge-kutta method to find y(0.2) given that y'=x+y, y(0)=1.

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