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.
BCA. END SEMESTER EXAMINATIONS APRIL-2022
SEMESTER - II
20UCAAT2002 - Allied Mathematics - II

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

Section A

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

1. Explain the geometrical interpretation of Newton – Raphson method for finding the root of algebraic equation $f(x) = 0$.
2. Form the divided difference table for the function $f(x)=x^2+2x+2$, whose arguments are 1,2,4,7,10.
3. Find $\frac{dy}{dx}$ at $x = 51$ from the following data

X	50	60	70	80	90
Y	19.96	36.65	58.81	77.21	94.61

4. Find the mean and variance of the Binomial distribution.
5. Find the coefficient of correlation for the following data .

X	35	40	60	79	83	95
Y	17	28	30	32	38	49

6. When we say that the system of equations is diagonally dominant. Also verify the following system is diagonally dominant. If not make it diagonally dominant 3x+9y-2z=10 ; 4x+2y+13z=19 ; 4x-2y+z=3.
7. The marks obtained by the students in Mathematical and Statistics are as follows

Marks in Mathematics	35	23	47	17	10	43	9	6	28
Marks in Statistics	30	33	45	23	8	49	12	4	31

   Compute the ranks for the two subjects and the coefficient of correlation of ranks.
8. The population of a certain town is shown in the following table .

X	50	60	70	80	90
Y	19.96	36.65	58.81	77.21	94.61

   Find the rate of growth of the population in 1961.

Section B

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

9. Solve the following system of equations using Gauss seidel iteration methods 6x+15y+2z=72 ; x+y+54z=110 ; 27x+6y-z=85.

Contd...

10. Use Lagrange's interpolation formula to fit a polynomial to the following data .

X	0	1	3	4
Y	-12	0	6	12

Find the value of Y when X=2 ?

11. Evaluate $\int_0^1 \frac{dx}{1+x}$, using
    i. Trapezoidel rule.
    ii. Simpson's one third rule.
    iii. Simpson's three eight rule.
    iv. Find the error in each method by comparing with the actual integration upto 4 places of decimals.

12. A random variable X has the following probability function :

Values of X, x :	0	1	2	3	4	5	6	7
P(x)	0	k	2k	2k	3k	k	$2k^2$	$7k^2+k$

    i. Find k.
    ii. Evaluate P(X<6),P(X≥6) and P(0<X<5).
    iii. If P(X≤a)>$\frac{1}{2}$, find the minimum value of a.
    iv. Determine the distribution function of X.

13. Find the equation of regression lines for the following data.

X	1	2	3	4	5	8	10
Y	9	8	10	12	14	16	15

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