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 NOVEMBER -2023
SEMESTER - II
20UCAAT2002 - 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 $f(x) = 2x^3 - 3x - 6 = 0$ by Newton – Raphson method correct to five decimal places.
2. Find the 7^{th} term of the sequence 2,9,28,65, 126, 217 and also find the general term.
3. The population of a certain city is given below. Find $\frac{dy}{dx}$ at $x = 1931$

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

4. The number of monthly breakdown of a computer is a random variable having a poisson distribution with mean equal to 1.8. Find the probability that this computer will function for a month.
   a) without a breakdown
   b) with only one breakdown
   c) with atleast one breakdown.
5. Ten competitors in a musical test were ranked by 2 judges x & y in the following order

Ranks By x	1	6	5	10	3	2	4	9	7	8
Ranks By y	3	5	8	4	7	10	2	1	6	9

   Find Spearman's Rank Correlation Coefficient.
6. Using Lagrange's Interpolation formula, find y (10) from the following table.

x :	5	6	9	11
y :	12	13	14	16

7. Use Gauss-Seidal iterative method to obtain the solution of the equation:
   $28x + 4y - z = 32, \quad x + 3y + 10z = 24, \quad 2x + 17y + 4 = 35$
   Correct to 4 decimal accuracy

Contd...

8. A coin is tossed three times. Find the chances of getting
   a. three heads
   b. two heads and one tail.
   c. head and tail alternatively.

Section C

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

9. Solve the system of equations by Gauss elimination method
   $x + 2y + z = 3, \quad 2x + 3y + 3z = 10, \quad 3x - y + 2z = 13$

10. Using Newton's Divided difference formula, find the value of f(2), f(8) and f(15) from the table given below:

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

11. Evaluate $I = \int_0^6 \frac{1}{1+x} dx$
    Using 1) Trapezoidal Rule
    2) Simpson's 1/3 Rule
    3) Simpson's 3/8 Rule

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

0	1	2	3	4	5	6	7
0	k	2k	2k	3k	K^2	$2k^2$	$7k^2+k$

    1. Find K
    2. Evaluate P(0 < x < 5)
    3. Determine the distribution function of X.

13. Calculate the correlation coefficient for the following weights in inches of fathers(X) and their sons(Y)

X	65	66	67	67	68	69	70	72
Y	67	68	65	68	72	72	69	71

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