

**BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE
(AUTONOMOUS)**

I-BCA I-Semester Regular/Supplementary Examinations (BR24), Feb - 2026

Numerical and Statistical Methods (BCA)

Time: 3 hours

Max. Marks: 70

*Question Paper consists of Part-A and Part-B
Answer ALL the question in Part-A and Part-B*

PART-A (10X2 = 20M)

	Marks	CO	BL
1.a) Write the Regula false formula.	2M	CO1	L1
b) Define transcendental equation.	2M	CO1	L1
c) Write the augmented matrix for the following equations. $2x + 3y + z = 9,$ $x + 2y + 3z = 6, 3x - y + 2z = 8$	2M	CO2	L1
d) Find the Eigen values of the matrix $A = \begin{bmatrix} 2 & 0 \\ 0 & 4 \end{bmatrix}$.	2M	CO2	L2
e) Write the Newton's Backward interpolation formula.	2M	CO3	L1
f) Prove that $\Delta = E - 1$.	2M	CO3	L4
g) Find the median of the following data 38,57,58,61,42,65,72,66.	2M	CO4	L2
h) Find the variance for the given data 4,5,2,8,7.	2M	CO4	L2
i) State the Addition theorem.	2M	CO5	L2
j) IF $P(A)=1/3$, $P(B)=1/4$ and $P(A \cap B)=1/12$ then find $P(A/B)$.	2M	CO5	L3

PART-B (5X10 = 50M)

2a. Find a real root of the equation $x^3 - x - 1 = 0$ using Interval Halving method.	10M	CO1	L3
(OR)			
3 a. Find a real root of the equation $x \sin x + \cos x = 0$ using Newton Raphson method.	5M		
3 b. Find the real root of the equation $x^3 - 9x + 1 = 0$ using Secant method.	5M	CO1	L3
4a. Solve the system of equations $2x + y + z = 10, 3x + 2y + 3z = 18,$ $x + 4y + 9z = 16$ using Gauss- Elimination method.	10M	CO2	L3
(OR)			
5a. Solve the system of equations $10x + 2y + z = 9,$ $2x + 20y - 2z = -44, -2x + 3y + 10z = 22$ using Gauss-Seidel method.	10M	CO2	L3

6a. Find Y(2) using Lagrange's interpolation formula 5M

X	0	1	3
Y	1	3	55

6 b. Given that $\sqrt{12500} = 111.8034, \sqrt{12510} = 111.8481, \sqrt{12520} = 111.8928$
 $\sqrt{12530} = 111.9375$. Find $\sqrt{12516}$ by using Newton's forward interpolation formula. 5M CO3 L3

(OR)

7a. Evaluate $\int_0^1 \frac{1}{1+x^2} dx, n=6$ using (i) Trapezoidal rule (ii) Simpson's 1/3 rule. 10M CO3 L5

8a.	Calculate Karl Pearson's coefficient of Skewness for the following data									10M	CO4	L3
	C.I	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40			
	Frequency	2	5	7	13	21	16	8	3			
(OR)												
9a.	Find the correlation coefficient for the following data									10M	CO4	L3
	Fertiliser used(tonnes)	15	18	20	24	30	35	40	50			
	Productivity (tonnes)	85	93	95	105	120	130	150	160			

10a. A can hit a target once in five shots. B can hit two targets in 3 shots. C can hit one target in 4 shots. What is the probability that 2 shots hit the target? 5M CO5 L3

10 b. One card is drawn from a regular deck of 52 cards. What is the probability of card being either red or a king. 5M

(OR)

11a. In a bolt factory machines A,B,C manufacture 20%, 30% and 50% of the total of their output and 6%, 3% and 2% are defective. A bolt is drawn at random and found to be defective. Find the probabilities that it is manufactured from (i) Machine A (ii)Machine B. 10M CO5 L4
