

Exam. Code : 107202  
Subject Code : 1651

Bachelor of Computer Application (BCA)  
2<sup>nd</sup> Semester (Batch 2022-25)

NUMERICAL METHODS AND STATISTICAL  
TECHNIQUES

Paper—III

Time Allowed—3 Hours] [Maximum Marks—75

Note :—Attempt FIVE questions in all, selecting at least ONE question from each section. The fifth question may be attempted from any section. All questions carry equal marks.

SECTION—A

1. (a) Find real root of equation  $x^3 - x - 1 = 0$  using bisection method correct to three decimal places.  
(b) Round off the number 756250 to four significant digits. Find absolute error, relative error, percentage error.

2. (a) Find iterative formula for  $\frac{1}{\sqrt{N}}$ . Hence evaluate

$\frac{1}{\sqrt{17}}$  using Newton Raphson method correct to three decimal places.

- (b) Find a real root of equation  $x^3 - 3x - 5 = 0$  by Regula Falsi method correct to three decimal places.

SECTION—B

3. (a) Use Newton backward formula. Fit a cubic polynomial then find  $f(0.7)$  :

X	0.1	0.2	0.3	0.4	0.5	0.6
Y	2.68	3.04	3.38	3.68	3.96	4.21

- (b) Using Lagrange interpolation formula, evaluate  $f(10)$  :

X	25	30	40	50
Y	52	67.3	84.1	94.4

4. (a) Use Simpson  $\frac{3}{8}$  rule  $I = \int_0^6 \frac{dx}{1+x^2}$ , take  $n = 6$ .

- (b) Use trapezoidal rule, to compute  $\int_0^1 \frac{dx}{1+x}$  take  $n = 6$ .

SECTION—C

5. (a) Find coefficient of variation for the following data :

X	10	15	20	25	30	35
F	10	8	9	10	15	18

- (b) Find Mean for the following data :

X	10	20	30	40	50	60	70
F	3	5	8	14	10	6	4

6. (a) Find Mean Deviation from Mean for the following data :

X	10	62	64	66	68	70
F	10	14	18	24	20	14

- (b) Find Standard Deviation for the following data :

X	0-10	10-20	20-30	30-40
F	5	8	10	15

X	40-50	50-60	60-70	70-80
F	20	25	10	7

**SECTION—D**

7. (a) Fit the curve of best fit of type  $Y = ae^{bx}$  to the following data :

X	1	5	7	9	12
Y	10	15	12	15	21

- (b) Fit the curve of best fit of type  $Y = ab^x$  to the following data :

X	1	2	3	4	5	6	7	8
Y	1.0	1.2	1.8	2.5	3.6	4.7	6.6	9.1

8. (a) Fit the curve of best fit of type  $Y = a + bX + cX^2$  to the following data :

X	4	5	6	7	8
Y	8	12	18	24	32

- (b) Fit the curve of best fit of type  $Y = aX^b$  to the following data :

X	1	2	3	4	5	6	7	8
Y	15.3	20.5	27.4	36.6	49.1	65.6	87.8	117.6