Exam. Code : 107202
Subject Code : 1615

Bachelor of Computer Application (BCA) 2nd Semester

NUMERICAL METHODS & 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) Solve by false position method $x^3 + x - 1 = 0$ correct to three decimal places. 7½

   (b) Using Newton Raphson formula, derive recurrence formula for $\sqrt{N}$. Hence evaluate $\sqrt{32}$. 7½

2. (a) Solve the following system of equations by gauss elimination method :

$$2x + 4y - 6z = -8$$

$$x + 3y + z = 10$$

$$2x - 4y - 2z = -1$$

7½

(b) Solve the following system of equations by gauss Jordan method :

$$x + y + z = 9$$
$$2x - 3y + 4z = 13$$
$$3x + 4y + 5z = 40$$ 7½

SECTION—B

3. (a) Using Newton forward difference formula, fit a polynomial of degree 3 :

X	3	4	5	6
Y	6	24	60	120

7½

(b) Using Newton divided difference formula, evaluate f(8) :

X	4	5	7	10	11	13
Y	48	100	294	900	1210	2028

7½

4. (a) Evaluate $\int_0^6 \frac{dx}{1+x^2}$ take h = 1, using trapezoidal rule. 7½

(b) Evaluate $\int_3^5 \frac{4}{2+x^2} dx$ take n = 8, using Simpson $\frac{1}{3}$ rule. 7½

SECTION—C

5. (a) Calculate median for the following data :

X	0–5	5–10	10–15	15–20	20–25	25–30	30–35
F	4	6	10	16	12	8	4

7½

(b) Calculate Standard Deviation for the following data :

X	5–10	10–15	15–20	20–25	25–30	30–35
F	2	9	29	24	11	6

7½

6. (a) Find Karl Pearson coefficient of correlation for the following data :

X	10	12	18	16	15	19	18	17
Y	30	35	45	44	42	48	47	46

7½

(b) Calculate arithmetic mean for the following data :

X	100–120	120–140	140–160	160–180	180–200
F	4	6	10	8	5

7½

SECTION—D

7. (a) Fit a straight line of form $y = a + bx$:

X	5	8	7	6	4
Y	3	4	5	2	1

7½

(b) Fit a second-degree polynomial :

X	1.0	1.5	2.0	2.5	3.0
Y	1.1	1.3	1.6	2.0	3.4

7½

8. (a) Fit a curve of type $Y = aX^b$ for the following data :

X	1	2	3	4	5	6
Y	1200	900	600	200	110	50

7½

(b) Fit a curve of type $Y = a + bX + cX^2$:

X	−3	−1	1	3
Y	15	5	1	5

7½