Exam. Code : 107202
Subject Code : 1735

Bachelor of Computer Application (BCA) 2nd Semester
NUMERICAL METHODS AND STATISTICAL TECHNIQUES
Paper—III

Time Allowed—Three Hours]   [Maximum Marks—75

Note :— Attempt **FIVE** questions, by selecting at least **ONE** from each section. Fifth question will attempt from any section. All questions carry equal marks.

SECTION—A

1. (a) Find root of equation $x^3 - 5x + 3 = 0$ using bisection method, correct to three decimal places.

    (b) Given that $U = \dfrac{5xy^2}{z^3}$ and errors in x, y, z be 0.001. Compute maximum relative error in U when $x = y = z = 1$.

2. (a) Find real root of equation $x^3 + x - 1 = 0$ correct to three decimal places using false position method.

    (b) By taking $x_0 = 0.9$. Check whether the equation $x^3 - x^2 - x + 1 = 0$ has a double root or not.

SECTION—B

3. (a) Using Newton backward difference formula, find a polynomial of degree 4 in x :

x	1	2	3	4	5
y	1	−1	1	−1	1

(b) Evaluate $\int_0^1 \dfrac{dx}{x+1}$ correct to 3 decimal places using trapezoidal rule with h = $\dfrac{1}{6}$.

4. (a) Evaluate $\int_1^3 \dfrac{dx}{x}$ using n = 8 in Simpson's $\dfrac{1}{3}$ rule.

(b) Prepare a divided difference table for following data :

x	1	3	6	10	11
p(x)	3	31	223	1011	1343

SECTION—C

5. (a) Calculate standard deviation from following data :

x	12	14	16	18	20	22	24
f	6	12	18	26	16	10	8

(b) Calculate co-efficient of correlation from following data :

x	10	12	18	16	15	19	18	17
y	30	35	45	44	42	48	47	46

6. (a) Find mean from following data :

x	f
2–6	1
6–10	9
10–14	21
14–18	47
18–22	52
22–26	36
26–30	19
30–34	3

(b) Calculate missing frequency with median = 28 :

x	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50
f	5	8	?	16	6

SECTION—D

7. (a) Fit a curve of farm $y = ae^{bx}$ to following data :

x	0	1	2	3
y	1.05	2.10	3.85	8.30

(b) Fit a parabola $y = a + bx + cx^2$ to following data :

x	1	2	3	4	5	6	7	8	9
y	2	6	7	8	10	11	11	10	9

8. (a) Fit a straight line to following data :

x	6	7	7	8	8	8	9	9	10
y	5	5	4	5	4	3	4	3	3

(b) Using method of least square, fit curve of type $y = ax + bx^2$:

x	1	2	3	4	5
y	1.8	5.1	8.9	14.1	19.8