

Exam. Code : 105702  
Subject Code : 1443

B.Sc. (Information Technology) 2<sup>nd</sup> Semester  
(Batch 2021-24)  
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. Describe Newton-Raphson method to solve a transcendental equation. How is this method better than Bi-section method ? Use this method to evaluate the cube root of 12 correct up to two decimal places.
2. Solve the following equations by Gauss Jordan method :

$$2x + 2y + 2z = 14$$

$$2x + 4y + 6z = 32$$

$$2x + 6y + 8z = 44$$

### SECTION—B

3. Using Newton's forward interpolation formula, find  $f(78)$  from the following table :

x	80	85	90	95	100
f	5026	5674	6362	7088	7854

4. Fit a straight line to the following data regarding x as the independent variable :

x	0	1	2	3	4
y	1.0	1.8	3.3	4.5	6.3

Hence find the difference between the actual value of y and the value of y obtained from the fitted curve when  $x = 3$ .

### SECTION—C

5. Calculate Mean, Median, Mode, Variance and Coefficient of Variation from the following data relating to production of a steel mill on 60 days.

Production (in tons per day)	21-22	23-24	25-26	27-28	29-30
Number of days	7	13	22	10	8

6. Define Dispersion. What are the various measures of dispersion ? Explain each in detail with examples and differentiate between them.

#### SECTION—D

7. (a) Explain the method of Least Squares with an example.
- (b) Given below are the data relating to the production of sugarcane in a district. Fit a straight line trend by the method of least squares and tabulate the trend values.

Year	2000	2001	2002	2003	2004	2005	2006
Sugarcane Production	40	45	46	42	47	50	46

8. Calculate fitting exponential equation ( $y = ab^x$ ) from the following data :

X	0	1	2	3	4	5	6	7
Y	10	21	35	59	92	200	400	610