Exam. Code : 105702
Subject Code : 1563

B.Sc. (Information Technology) 2nd Semester

NUMERICAL METHODS AND STATISTICAL TECHNIQUES

Paper—V

Time Allowed—Three Hours] [Maximum Marks—75

Note :— Attempt any **FIVE** questions. All questions carry equal marks. The use of non-programmable and non-storage type calculator is allowed.

1. Differentiate between the following :—
   (a) Numerical methods and numerical analysis.
   (b) Absolute and relative errors.
2. Using the bisection method, find an approximate root of the equation sin x = 1/x, that lies between x = 1 and x = 1.5 (measured in radians).
3. Apply Gauss Jordan method to solve the equations :

$$x_1 + x_2 + x_3 = 9$$
$$2x_1 - 3x_2 + 4x_3 = 13$$
$$3x_1 + 4x_2 + 5x_3 = 40$$

4. Evaluate $\int \frac{dx}{(1+x)} dx$ from interval [0, 1] applying :

   (i) Trapezoidal rule

   (ii) Simpson's 1/3 rule

   (iii) Simpson's 3/8 rule.

5. Find the value of y(2.5) if the function f(x) is given as :

x	0	1	2	3
f(x)	0	2	8	27

6. Fit a second degree polynomial to the data in the table given below :

x	1.0	1.5	2.0	2.5	3.0
y	1.1	1.3	1.6	2.0	3.4

7. (a) What is the relationship between mean, median and mode ? Justify with an example.

   (b) A student while calculating the mean and standard deviation of 25 observations obtained a mean of 56 cm and a standard deviation of 2 cm. It was later discovered that he had wrongly copied down an observation as 64. What is the mean and standard deviation if the correct value is 46 ?

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