

Exam. Code : 105702

Subject Code : 7166

B.Sc. (Information Technology) 2nd Semester

(Old Syllabus 2018)

NUMERICAL METHODS AND STATISTICAL
TECHNIQUES

Paper-V

Time Allowed—3 Hours]

[Maximum Marks—75

Note :— There are **eight** questions, attempt any **five**. Each question carries **15** marks. Use of Non-Programmable and Non-Storage type calculator is allowed.

1. (a) What is difference between numerical methods and numerical analysis ? 5
- (b) Which are different types of errors and their measures ? 10
2. (a) Find a root of the equation $x^3 - 4x - 9 = 0$ using bisection method. 7.5
- (b) Find a root of the equation $x^3 - x - 4 = 0$ between 1 and 2, correct to 3 decimal places using Newton Raphson method. 7.5

3. (a) Solve the following system of linear equations using Gauss Elimination Method :

$$x + y + z = 3$$

$$2x + 3y + z = 6$$

$$x - y - z = -3 \quad 7.5$$

- (b) Find the inverse of the following matrix using Gauss Jordan Method :

$$\begin{bmatrix} 1 & 1 & 2 \\ 1 & 2 & 3 \\ 2 & 3 & 1 \end{bmatrix} \quad 7.5$$

4. (a) Evaluate following by trapezoidal rule taking $n = 4$:

$$\int_0^2 \frac{dx}{1+x^4} \quad 7.5$$

- (b) Evaluate following by using Simpson's 3/8 rule taking $h = 1/6$:

$$\int_0^1 \frac{dx}{1+x^2} \quad 7.5$$

5. (a) Following table gives the normal weight of a baby during first six months of life. Estimate the weight of a baby at age of 4 months.

Age in Months :	0	2	3	5	6
Weight (in kg)	5	7	8	10	12
					10

- (b) Write an algorithm of Lagrange interpolation method.

6. For the following function, find the value of $f(2.15)$:

x	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7
f(x)	.577	.568	.556	.540	.520	.497	.471	.442

15

7. Which are various measures of Central Tendency ? Write their merits and demerits. 15

8. What is dispersion ? Which are various measures of dispersion ? 15