

**B.A./B.Sc. 3<sup>rd</sup> Semester****COMPUTER SCIENCE****(Computer Oriented Numerical & Statistical Methods)**

Time Allowed—3 Hours]

[Maximum Marks—75

**Note :—** Attempt any **FIVE** questions. All questions carry equal marks.

1. (a) Explain Numerical methods and Numerical analysis through suitable justifications.
- (b) What is error ? How it is estimated ? Give suitable examples to measure them.
2. (a) Define non-linear equation How these are solved using bisection method ? Explain.
- (b) Solve using Gauss-Seidel method with  $x_0 = 0$ ,  $x_1 = 0$  and  $x_2 = 0$  as starting values. Carry out 7 iterations :

$$-3.5x_0 + x_1 + 1.5x_2 = 2.5$$

$$x_0 + 4x_1 - x_2 = 4$$

$$-2x_0 - 0.6x_1 - 3.5x_2 = -16$$

3. (a) Consider

x	40	60	80	100
f(x)	205	201	195	190

Fit a third-order polynomial using Newton backward difference formula.

- (b) How matrix inversion method works ? Explain with example of your choice.
4. (a) What is the importance of Numerical Integration ? Explain how Simpson's 3/8 Rule is utilized for it.
- (b) Let given function f(x) is

x	2	3	6	8	12
f(x)	14	20	17	16	23

Estimate f(5) from the above table.

5. (a) Define Mean. How arithmetic, geometric and harmonic means are calculated ? Explain with example. <http://www.gnduonline.com>
- (b) Why standard deviation and co-efficient of variations are calculated ? Explain the formulas for their calculation.
6. (a) Explain the difference between Bivariate Distribution and Multivariate Distributions with suitable examples.

- (b) Why regression is used ? Explain multiple regression calculation through suitable example.
7. (a) What is measured through linear trend and non linear trend ? Explain in detail.
- (b) What is correlation ? How is it different from regression ? Explain with suitable example justifications.
8. Write notes on :—
- (a) False Position Method
- (b) Simultaneous solution of equations.