

**Exam. Code : 103203**

**Subject Code : 1092**

**B.A./B.Sc. 3<sup>rd</sup> Semester (Batch 2021-24)**

**COMPUTER SCIENCE**

**(Computer Oriented Numerical & Statistical Methods)**

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. Which are different types of errors ? Give example of each. Also explain Error Propagation with respect to multiplication and division.
2. Explain Newton-Raphson method of solving non-linear equations. Find the roots of  $x^3 - x - 1$  correct upto three decimal digits.

**SECTION—B**

3. (a) What is meaning of simultaneous equations ? Which are their types ? 5  
(b) Solve the following system of equations by Gauss-Jordan method :

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

$$2x + 3y + 4z = 20$$

$$4x + 3y + 2z = 16$$

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4. What is Inverse of a matrix ? Which are different methods to find Inverse of a matrix ? Find Inverse of the following matrix using Matrix Inversion Method :

$$\begin{pmatrix} 1 & 2 & 3 \\ 3 & -2 & 1 \\ 4 & 1 & 1 \end{pmatrix}$$

**SECTION—C**

5. (a) Explain the meaning, difference and use of Interpolation and Extrapolation.  
(b) For the following table of values, find  $f(7.5)$  :  
x : 1 2 3 4 5 6 7 8  
f(x) : 1 8 27 64 125 216 343 512
6. (a) Calculate the following using Trapezoidal rule by taking  $n = 4$  :

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

- (b) Calculate using Simpson's  $\frac{1}{3}$  rule by taking  $n = 10$  :

$$\int_0^5 \frac{dx}{4x+5}$$

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### SECTION—D

7. (a) What is dispersion ? Which are various measures of dispersion ?
- (b) Calculate mean deviation and standard deviation for the following table :

x :	25	27	31	35	36
f :	3	2	4	1	2

8. Write notes on the following :
- (a) Mode
- (b) Kurtosis
- (c) Regression.