

Exam. Code : 103203

Subject Code : 1089

B.A./B.Sc. 3rd Semester (Batch 2020-23)

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. (a) Define error. Explain its various types with example. 8
- (b) Determine the solution of equation using Bisection method :
$$x^3 - x - 3 = 0. \quad 7$$
2. (a) Why interpolation methods are used ? Explain any one of your choice with example. 8
- (b) Determine the root using false position formula
$$3x^2 + 6x - 45 = 0. \quad 7$$

SECTION—B

3. (a) Which are the various types of solutions and methods to solve system of simultaneous equations ? Exemplify any method. 8

(b) Solve through Gauss-elimination method :

$$2x_1 + 2x_2 + x_3 = 6$$

$$3x_1 + 3x_2 + 2x_3 = 11$$

$$x_1 + x_2 - x_3 = (-3) \quad 7$$

4. (a) Explain the process and steps of solving equations through Matrix Conversion Method. 8

(b) Solve by using Gauss Siedel Method :

$$x_1 + x_2 - x_3 = (-2)$$

$$x_1 + 3x_2 + 2x_3 = (11)$$

$$x_1 - 3x_2 + x_3 = (-4) \quad 7$$

SECTION—C

5. (a) Define interpolation. How Newton's Methods interpolate the data ? Explain steps. 8

(b) Solve by using Lagrangian Method to find Y when (X = 0) :

X	-1	-2	2	4
Y	-1	-9	11	69

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6. (a) How integration is evaluated for a function using Trapezoidal method ? Explain. 8

(b) Evaluate using Simpson's 1/3 rule after explaining the method itself :

$$\int_0^{\left(\frac{\pi}{2}\right)} \sqrt{\sin x} \, dx \quad 7$$

SECTION—D

7. (a) Explain different measures of Central Tendency in short. 8

(b) What do you mean by Correlation ? How is it calculated ? Explain and calculate for :

Height	10	20	30	40	50	60	70	80
Weight	32	20	25	35	40	28	38	45

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8. (a) What is Regression ? Draw difference between Linear and Multiple Regression through example. 8

(b) Fit a straight line trend by the straight line method of least square for data :

Year	1993	1994	1995	1996	1997	1998
Sales	7	10	12	14	17	24

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