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Exam. Code : 103203
Subject Code : 1091

B.A./B.Sc. 3rd Semester

COMPUTER SCIENCE

(Computer Oriented Numerical & Statistical Methods)

Time Allowed—3 Hours] [Maximum Marks—75

Note :— Attempt **FIVE** questions in all selecting at least **ONE** from each section A, B, C and D. **Fifth** question may be attempted from any section.

SECTION—A

1. (a) What is error ? Draw difference among Absolute error, Relative error and Percentage error. 8

   (b) Determine the root of equation $3x^2 + 6x - 45 = 0$ using false position method. 7

2. (a) Compare and contrast Numerical methods versus Numerical analysis. 8

   (b) How Newton-Raphson Method works ? Illustrate using $x^2 - 25 = 0$ with initial given $x = 7$. 7

SECTION—B

3. (a) What is simultaneous equation ? Which are the possible solutions for linear equations ? Explain with examples. 8

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(b) Solve through Gauss-elimination Method :

$$x_1 + x_2 + x_3 = 3$$
$$2x_1 + 3x_2 + x_3 = 6$$
$$x_1 - x_2 - x_3 = (-3)$$ 7

4. (a) Describe various ways for solving equations simultaneously. Give at least one example. 8

(b) Solve through Gauss Siedel Method :

$$9x_1 + 2x_2 + 4x_3 = 20$$
$$x_1 + 10x_2 + 4x_3 = 6$$
$$2x_1 - 4x_2 + 10x_3 = (-15)$$ 7

SECTION—C

5. (a) What is interpolation ? How Langrange and Newton method derive formulas for it ? Explain. 8

(b) Evaluate definite integral using Simpson's $\frac{1}{3}^{rd}$ rule by dividing the range into 10 equal parts :

$$\int_0^5 \frac{dx}{4x+5}$$ 7

6. (a) Why numerical integration is required ? How the formulas for Trapezoidal and Simpson $\frac{1}{3}$ methods are derived ? 8

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(b) Solve using trapezoidal method $\int_a^b (x^3+1)dx$ for $a = 1$ and $b = 1.5$. 7

SECTION—D

7. (a) Define mean, median and mode. Describe their computation through suitable example. 8

(b) Find regression equation of (X on Y) and (Y on X) :

X	6	2	10	4	8
Y	9	11	5	8	7

7

8. (a) Calculate mean deviation and standard deviation for :

x	25	27	31	35	36
frequency	3	2	4	1	2

8

(b) Compare bivariate and multivariate distribution through suitable examples. 7

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