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BCA / D-18

COMPUTER ORIENTED NUMERICAL METHODS

Paper-BCA-236

Time allowed : 3 hours] *[Maximum marks : 80*

Note : *Attempt **five** questions in all, selecting **one** question from each unit. **Question no. 1 is compulsory.***

1. (a) What is percentage error ? 16

(b) Write the order of convergence for bisection method.

(c) What is formula for Regula Falsi method ?

(d) What is simultaneous Linear Equations ?

(e) Write the Taylor Series formula.

(e) Define interpolation.

(f) Write the Newton's formula for backward interpolation.

(g) Define interpolation with unequal intervals.

Unit-I

2. (a) What do you mean by normalized floating point representation ? 8

(b) Explain the pitfalls in computing using normalized floating point representation. 8

3. Explain the various types of errors that occur while performing numerical computations. 16

Unit-II

4. Explain and find the order of convergence of the following methods : 16

   (a) Regula Falsi

   (b) Newton-Raphson

   (c) Iterative

5. Solve the following by Gauss Elimination method : 16

$$4x_1 + x_2 + + 3x_3 = 11$$

$$3x_1 + 4x_2 + 2x_3 = 11$$

$$2x_1 + 3x_2 + x_3 = 7$$

6. Write short note on : 16

   (a) Chebyshev polynomials

   (b) Interpolation and approximation

7. Given : 16

x	4	5	7	10	11	13
f(x) :	48	100	294	900	1210	2028

Find f (15) by Newton's divided difference formula.

Unit-IV

8. Evaluate $\int_0^2 \frac{dx}{1+x^4}$ by trapezoidal rule with h = 0.5. 16

9. Evaluate $\int_0^1 \frac{dx}{1+x^2}$ by (i) Simpson's 1/3 rule (ii) Simpson's 3/8 rule. 16