B.C.A. Part–I Semester–I (Old) Examination

NUMERICAL METHODS

Time : Three Hours] [Maximum Marks : 60

Note :— (1) All questions are compulsory.

(2) All questions carry equal marks.

1. (a) What is numerical computing ? Explain with which type of problems numerical computing is dealing. 4

(b) Describe with the help of block diagram the process of numerical computing. 4

(c) Distinguish between analog computing and digital computing. 4

OR

2. (a) What do you mean by mathematical model ? How will you formulate it ? 4

(b) Explain discrete data and continuous data with example. 4

(c) Explain new trends in numerical computing. 4

3. (a) Explain the concept of significant digit with example. 4

(b) Explain the concept of inherent errors. 4

(c) State and explain triangular inequality as applied to error propagation. 4

OR

4. (a) Explain Absolute and Relative error. 4

(b) What is the accuracy of the following numbers ?

(i) 0.008472

(ii) 3600

(iii) 12.345

(iv) 750.5 4

(c) What do you mean by significant digit ? Explain the term accuracy and precision related to significant digits. 4

5. (a) Describe how will you find out root of equation $f(x) = 0$ by Bisection method. 6

(b) Find the root of equation $f(x) = x^3 - 4x - 9 = 0$ by using Bisection method. 6

OR

6. (a) Find graphically the positive root of an equation $x^3 - 6x - 13 = 0$. 6

(b) Find the real root of equation $f(x) = x^3 - 3x - 5 = 0$ by using false position method. 6

7. (a) Obtain roots of equation $f(x) = x^3 + 3x + 5$ by using Newton Raphson method. 6

(b) Obtain roots of equation $f(x) = x^3 - x + 4 = 0$ by using secant method. 6

OR

8. (a) Explain fixed point iteration method to find roots of non-linear equation. 6

(b) Derive the formula to find the roots of the equation in secant method. 6

9. (a) Solve the system of equations by Gauss Elimination method :

$$2x + y + 4z = 12$$

$$8x - 3y + 2z = 20$$

$$4x - 11y - z = 33$$ 8

(b) Explain the Gauss Elimination by partial pivoting method. 4

OR

10. (a) Solve using Gauss Jordan method :

$$3x + 4y + 4z = 15$$

$$5x + 2y + z = 18$$

$$2x + 3y + 2z = 10$$ 8

(b) Explain the difference between simple Gauss Elimination method and Gauss Jordan method. 4