

**B.C.A. (Part-I) Semester-I Examination****NUMERICAL METHODS****Paper-1ST4**

Time : Three Hours]

[Maximum Marks : 60

**Note :—** (1) All questions are compulsory.

(2) All questions carry equal marks.

(3) Assume suitable data wherever necessary.

1. (a) What do you mean by mathematical model ? How will you formulate it ? 4
- (b) What are the different phases involved in numerical computing ? 4
- (c) Distinguish between analog computing and digital computing. 4

**OR**

2. (a) Explain discrete data and continuous data involved in numerical computing with example. 4
  - (b) Explain new trends in numerical computing. 4
  - (c) What is Accuracy ? How is it affected during the process of Numerical computing ? 4
3. (a) Explain Inherent Errors. 4
  - (b) Explain the concept of significant digit with proper example. 4
  - (c) Explain Round off errors. 4

**OR**

4. (a) Round off the following numbers correct upto four decimal places :
    - (i) 0.005789
    - (ii) 0.235092
    - (iii) 56.243827
    - (iv) 0.560012 4
  - (b) Distinguish between rounding off error and truncation error. 4
  - (c) What do you mean by significant digit ? Explain the term accuracy and precision related to significant digits. 4
5. (a) Describe how you will find out root of equation  $f(x) = 0$  by Bisection method. 6
  - (b) Find graphically the positive root of an equation  $x^3 - 6x - 13 = 0$  6

**OR**

6. (a) Find the real root of equation  $f(x) = x^3 - 3x - 5 = 0$  by using false position method. 6
- (b) Find the root of equation  $f(x) = x^3 - 4x - 9 = 0$  by using Bisection method. 6

7. (a) State the Newton-Raphson method and how it is used to find roots of an equation. 6

(b) Find the root of equation by using Secant method :

$$f(x) = x^2 - 4x - 10 = 0 \quad 6$$

OR

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

(b) Find the root of equation  $f(x) = x^4 - x - 10 = 0$  by using Newton-Raphson method. 6

9. (a) Solve the following system of equation by using Gauss elimination with partial pivoting :

$$x + y + z = 1$$

$$3x + y - 3z = 5$$

$$x - 2x - 5z = 10 \quad 8$$

(b) Write any four differences between Simple Gauss Elimination method and Gauss Jordan method. 4

OR

10. (a) Solve the following system of equation by using Gauss Jordan method :

$$10x + 2y + z = 9$$

$$x + 10y - z = -22$$

$$-2x + 3y + 10z = 22 \quad 8$$

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