AU–186

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.

1. (a) Explain new trends in numerical computing. 4

   (b) What do you mean by numerical computing ? Explain how you will formulate mathematical model in numerical computing. 4

   (c) What are the different phases involved in numerical computing ? 4

OR

2. (a) Explain discrete data and continuous data involved in numerical computing. 4

   (b) What is Accuracy ? How is it affected during the process of numerical computing ? 4

   (c) Explain digital computing. 4

3. (a) Explain Inherent Errors. 4

   (b) Round off the following numbers to four significant figures :

   (i) .0054836

   (ii) 0.80084

   (iii) 21.543

   (iv) 0.14235 4

   (c) Explain the taxonomy of error in numerical computing. 4

OR

4. (a) Explain what do you mean by modeling error. How do they arise ? 4

   (b) Differentiate inherent error and numerical error in numerical computing. 4

   (c) What are the errors involved in numerical computing ? Explain any one of them. 4

5. (a) Find graphically the positive root of an equation :

$f(x) = x^3 - x - 11 = 0$. 6

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

OR

6. (a) Find the real root of equation $f(x) = x^3 - x - 1 = 0$ by using Bisection method. 6

(b) What is Graphical method ? Explain with suitable example. 6

7. (a) State the Newton Raphson formula and explain how it is used to obtain real root of the equation. 6

(b) Find the roots of equation by using secant method :

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

OR

8. (a) What are the limitations of Newton Raphson method ? 4

(b) Explain fixed point iteration method to find roots of non-linear equation. 4

(c) State comparison between Newton-Raphson method and Secant method. 4

9. (a) Solve using Gauss Jordan 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 Elimination method :

$10x + 2y + z = 9$

$x + 10y - z = -22$

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

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