

9. (a) Solve the following system of equations by using Gauss Jordan method :

$$2x_1 - 3x_2 + 4x_3 = 8$$

$$x_1 + x_2 + 4x_3 = 15$$

$$3x_1 + 4x_2 - x_3 = 8 \quad 8$$

- (b) Explain the basic concepts used in the Gauss elimination approach. 4

OR

10. (a) Describe the two basic phases that are employed for solving a system of linear equations. 4
- (b) Solve the following system of equation by Gauss Elimination method :

$$2x_1 + 3x_2 + x_3 = 9$$

$$x_1 + 2x_2 + 3x_3 = 6$$

$$3x_1 + x_2 + 2x_3 = 8 \quad 8$$



First Semester B. C. A. (Part - I) Examination

NUMERICAL METHODS

I ST 4

P. Pages : 4

Time : Three Hours]

[Max. Marks : 60

1. (a) Explain what do you mean by modelling. How will you formulate Mathematical problem ? 4
- (b) Explain new trends in Numerical computing. 4
- (c) Explain Digital computing. 4

OR

2. (a) Explain discrete data and continuous data involved in numerical computing. 4
- (b) What are the different phases involved in numerical computing ? 4
- (c) What do you mean by mathematical model ? How will you formulate it ? 4
3. (a) Explain Inherent Errors. 4
- (b) Explain what do you mean by modelling error. How do they arise ? 4

- (c) Round off the following numbers to four significant figures :—

- (i) -0063945 (ii) 0.90038
(iii) 12.345 (iv) 0.16153 4

OR

4. (a) State and explain triangular inequality as applied to error propagation. 4
(b) What are the errors involved in numerical computing ? Explain any one of them. 4
(c) Find the truncation error in the result of the following function for $x=1/5$ when we use :
(i) First three terms
(ii) First four terms.

$$e^x = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!} + \frac{x^5}{5!} + \frac{x^6}{6!}$$

4

5. (a) Find graphically the positive root of an equation $3x^3 - 6x - 10 = 0$. 6
(b) Explain how will you find the roots by using bisection method. 6

OR

6. (a) Explain false position method to find root of an equation $f(x) = 0$. 6
(b) Find a root of the following equation by using bisection method : $x^3 + 3x - 5 = 0$. 6
7. (a) State the Newton Raphson formula and explain how it is used to obtain real root of the equation. 4
(b) Use the secant method to find the root of an equation $x^2 - 4x - 10 = 0$. 4
(c) Explain the procedure, how will you obtain root of the equation by fixed point iteration method. 4

OR

8. (a) What are the limitations of Newton Raphson method ? 4
(b) Derive the formula to find the roots of the equation in Secant Method. 4
(c) Find the positive root of the equation $x^4 - x - 10 = 0$ by the method of iteration. 4