COMSATS University
Islamabad

Mid Examinations Spring - 2025
Department of Mathematics

Class/Program: BCS-6 A.B
Subject: Numerical Computations MTH-375
Total Time Allowed: 1 hr 20 min
Student Name: _____

Date: _____
Instructor: Sharmeen Shahid
Maximum Marks: 25
Reg. No: _____

Attempt all questions. Each question carries equal marks. **CLO-1, PLO-2, C-3**

Section A (10 Marks)

1. Define relative error and round off error.
2. Write the stopping criteria for the Bisection Method.
3. What is the main advantage of the Newton-Raphson Method over the Bisection Method?
4. Define the convergence of Newton Raphson method..
5. Write the general form of the Secant Method.
6. What is the main idea behind Fixed Point Iteration?
7. Differentiate between Gauss Elimination and Gauss-Jordan Elimination.
8. What is LU Factorization, and why is it used?
9. Write the conditions for Cholesky factorization.
10. State the condition required for the simultaneous displacement method to converge.

Section B (15 Marks)

Q2: Find the real root of the equation using fixed point iteration correct upto four decimal places.

$$x^{0.1} - cosx = 10$$

Q3: Perform LU Factorization (Do-little's method) for the matrix and then solve the system:

$$4x - y = 2$$
$$-x + 4y - z = 6$$
$$-y + 4z = 2$$