EE1102 Introduction to Programming **Assignment 3-A**

Total Marks: 50
Due Date and Time: February 16, 2021 6 pm
Submission Procedure: Upload the C program files by the due date and time. The files should be named as specified in each problem statement. Replace ROLLNO with your roll no (all small letters). **Do not upload exe files.**

All programs should be readable with adequate comments and documentation.

Problem 1. [use of if-else statement] Write a C program ROLLNO_roots_poly.c that reads from *stdin* three floating point variables A, B, and C -- these three form coefficients of a 2nd order polynomial $f(x) = A x^2 + B x + C$. The program should determine the roots of $f(x) = 0$ using the discriminant method.

$$D = B^2 - 4 A C$$

Compute the discriminant D. Check to see if D is < 0, = 0, or > 0.

Accordingly it should print (i) $\frac{-B}{2A} \pm \frac{\sqrt{D}}{2A} i$ for complex roots, or (ii) $\frac{-B}{2A}$ for repeated roots, or (iii) $\frac{-B \pm \sqrt{D}}{2A}$ for real and distinct roots.

You can use the sqrt function in math.h to find the square root of a number.

Marks: 15

Problem 2. [use of while loop] Write a C program called ROLLNO_prime_number.c that reads an integer n and checks if n (|n| ≥ 2) is a prime number. You should use *while* loop for this problem.

Marks: 15

Problem 3. [use of if-else and for loop] Write a C program called ROLLNO_binomial_coefficient.c to input two integers (N and K) and compute the binomial coefficient N choose K, ${}^{N}C_{K}$. You should use *for* loop for this problem. You should check if your program works for cases such as 100 C 98. If not, you need to find a way to compute it.

Marks: 20