Roll No._____

COURSE CODE: 10B11CI311   MAX. MARKS: 25

COURSE NAME: Object Oriented Programming

COURSE CREDITS: 4   MAX. TIME: 1.5 Hours

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.

1. *[5 Marks; CO3]* Create a class quadratic for performing arithmetic on and solving quadratic equations. A quadratic equation is an equation of the form

$$ax^2+bx+c=0$$

   By introducing three overloaded operators as follows:
   a) Addition (+): add two quadratic objects
   b) Subtraction (-): subtract two quadratic objects
   c) Output operator (<<): Display a quadratic equation in the form $ax^2+bx+c=0$

2. *[4 Marks; CO3]* Define a class Directory with members: name and phone number. Use the class object to store each set of data into a text file "phone.txt". The names contain only one word and the names and telephone numbers are separated by white spaces. Write a C++ program to read the file and output the list in two columns, such as:

   John   23456

   Ahmed   9876

3. *[4 Marks; CO4]* Answer the following Questions-
   a. Write a C++ program to overload '+' (binary) operator using *friend* function.
   b. Differentiate between *early binding* and *late binding* with appropriate examples.

4. *[4 Marks; CO4]* What are the advantages of defining a class template? Define a class template *LinkedList* in C++. The class must have methods to insert and display the elements. In addition, there must be a method to sort the elements of a linked list.

5. **[4 Marks; CO5] Answer the following questions:**
   a) Define package in Java and explain the categories of packages with suitable examples for each type.

   b) Write a program to illustrate the uses of final keyword in multilevel inheritance.

6. *[4 Marks; CO3]* Define the following terms / Statements:
   a. What happens when a virtual function is called inside a non-virtual function in C++?
   b. Nameless object.
   c. Java is well suited language for internet programming.
   d. super