Daffodil International University

Department of Computer Science and Engineering

Faculty of Science & Information Technology

Midterm Examination, Fall 2021 @ DIU Blended Learning Center

Course Code: CSE221 (Day), Course Title: Object Oriented Programming

Level: 2 Term: 1 Section: All

Instructor: All Modality: Open Book Exam

Date: Saturday 13 November, 2021 Time: 09:00pm-11:30am

Two and half hours (2:30), Marks: 25

Question: 1	**CO1:** Able to identify classes, objects, members of the class, and relationships among them needed for solving specific problems	**[Marks: 5]**

a) Determine whether the following program will generate (i) compilation errors, (ii) runtime errors and explain the reason. If the program does not generate errors, say what it will print out; if the program generates errors, correct them and say what it will print out after the correction. Motivate your answers **[2.5]**

```
class A
{
     int i;
}
class B extends A
{
    int j;
    System.out.println(j + " " + i);
}
class inheritance
{
    public static void main(String args[])
    {
        B obj = new B();
        obj.display();
    }
}
```

b) Suppose, you are planning to visit Jahangirnagar University in this winter with your friend name “Rayhan”. His age is 21. He is tall and healthy. His eyes are brown. He can swim. He can also ride bikes and cook very well. **[2.5]**

Now, find out the identity, attributes and behaviors.

Question: 2	**CO2:** Able to apply knowledge of object-oriented programming and Java in solving problem.	**[Marks: 5]**

a) Suppose, your name is X, you father's name is Y, and your grandfather's name is Z. You have two uncles named U1 and U2. C1 is the son of U1. **[2.5]**

Now, draw a UML and show the relationship using your own name, your father's name and grandfather's name as class names. What types of inheritance it refers?

b) Which type of polymorphism is applied in the following program? Explain. **[2.5]**

```
public class Car {
   protected String model;
   public void drive()
   {
      System.out.println("Car  drives");
   }
}


class Volvo extends Car {
   private double speed;
   public void drive()
   {
      System.out.println("Volvo  drives faster");
   }
   public void drive(double speed)
   {
      System.out.println("Volvo  drives with the speed: "+speed);
   }

   public static void main(String[] args) {
      Volvo v1 = new Volvo();
      v1.drive();
      v1.drive(100);
   }
}
```

Question: 3	**CO3:** Able to develop unified modeling language (UML) models for specific problems	**[Marks: 5]**

a) Batsman and bowler are players. Each player has a name, contact address, telephone number and status (either batsman or bowler). The batsman class maintains the total run obtained by a batsman and the number of one-day matches he played. Similarly, the bowler class maintains the total wickets taken by a player and the total number of matches he played. The parent class contains a method to calculate the average of each player. **[5]**

Draw an UML of the above Scenario.

[**N.B.** Each ClassName will be started with your **firstName**. Suppose, your name is "Asif Hasan", and you want to create a class with the name "Driver", then the class name will be "**AsifDriver**"]

Question: 4	**CO4:** Able to demonstrate the concepts of OOP and write computer programs using OOP principles and Java to solve a real-life problem	**[Marks: 10]**

a) Implement the UML in Java that you have drawn from **Question: 3(a)**. Provide constructors to initialize the private data. Write a program to create an object of each type batsman and bowler and calculate the average runs/wickets obtained by a player. **[10]**

N.B. You are allowed with necessary assumptions for return type, modifiers and parameter of services