United International University (UIU)

Dept. of Computer Science & Engineering (CSE)

Final Exam, Trimester: Summer 2024
Course Code: CSE-1115, Course Title: Object Oriented Programming
Total Marks: 50, Duration: 2 Hours

Any examinee found adopting unfair means will be expelled from the trimester / program as per UIU disciplinary rules.
Answer all Five Questions

QUESTION 1 [10 MARKS]

Consider the following codes:

```
interface FirstInterface {
  public void myMethod_1();
  public void myMethod_2();
  public void myMethod_3();
}

interface SecondInterface extends FirstInterface {
  public void myOtherMethod_1();
  public void myOtherMethod_2();
  public void myOtherMethod_3();
}

abstract class Animal {
  public abstract void animalSound();
  public abstract void animalEat();
  public abstract void animalJump();
  public abstract void animalSpeed();
  public void sleep() {
    System.out.println("Zzzzzz");
  }
}

// Subclass (inherit from Animal)
class Tiger extends Animal implements SecondInterface {
  // Write the necessary code here;
}

class Main {
  public static void main(String[] args) {
    Tiger myObj = new Tiger ();
    myObj.myMethod();
    myObj.myOtherMethod();
  }
}
```

Write the Tiger class with necessary methods. Display the name of each method within every method.

QUESTION 2 [1+2+2=5 MARKS]

A. You are given a Student class:

```
class Student {
  int id;
  String name;
  double gpa;
  public Student(int id, String name, double gpa) {
    this.id = id;
    this.name = name;
    this.gpa = gpa;
  }
}
```

Now, you need to perform the following operations:

1. Create an ArrayList to store Student objects.
2. Insert the following entries into the list:

   101,“Hasibul Islam”,3.75
   102,“Mitu Rahman”,3.90
   103,“Fahim Khan”,3.40
   104,“Nusrat Jahan”,3.85
   105,“Aminul Haque”,3.55
   106,“Sumaiya Chowdhury”,3.78
3. Write code to swap the first two student objects in the list without creating new objects.

B. Consider the following codes: [5 MARKS]

```
public class Main {
 public static void main(String[] args) {
  int a[] = new int[3];
    int c = 10, d = 2;
    for(int i = 4; i >= 0; i--){
      if(i == 2) d = 0;
      try{
        a[i] = c / d;
      }
      catch(ArrayIndexOutOfBoundsException e){
        System.out.println("a");
      }
      catch(ArithmeticException e){
        System.out.println("b");
      }
    }
  }
}
```

Find the output of the code snippet.

QUESTION 3

[10 MARKS]

Write a Java program to read an input file named “myInputText” with multiple lines, which contain only numbers. Your task is to find the average of these numbers and write it into an “myOutputText” file. Both files are located in the “src” or current directory.

Example of “myInputText” file:

```
10
50
30
400
50
12
34
0
30
```

QUESTION 4 [10 MARKS]

Write a Java program to evaluate the expression 1 - 2 + 3 - 4 + 5 - ... - 50 using two threads. One thread will handle the addition of odd numbers, while the other will handle the subtraction of even numbers. The final result should be computed by combining the results from both threads.

QUESTION 5

[10 MARKS]

Consider the following codes:

```
public class MyColors implements ActionListener {
    private JFrame f; private JButton b;

    public MyColors() {
        f = new JFrame(“My Color”);
        b = new JButton(“Change Color”);

    }

    public void display(){
         b.addActionListener(this) ;
         b.setForeground(Color.red);
         b.setBackground(Color.yellow); // setting the button’s background color to red
         f.add(b ) ;
         f.setSize(400,400);
         f.setBackground (Color.green);
         f.setLayout(new FlowLayout( ));
         f.setVisible(true);
    }

    // Write the actionPerformed method here;

}
```

Implement the actionPerformed method so that pressing the button changes the background color randomly among green, red, and yellow.

To generate a random number from 0 to n (exclusive), use the following function:
int a = new Random().nextInt(n); // a will hold any integer from 0 to n-1

END OF THE QUESTION