United International University (UIU)

Dept. of Computer Science & Engineering (CSE)

Final Exam :: Summer 2020

Course Code: CSE 1115 Course Title: Object Oriented Programming

Total Marks: **25** Time: **1hr 15min**

Any examinee found adopting unfair means will be expelled from the trimester / program as per UIU disciplinary rules

Question 1 [4 + 1]

a) Complete the given code such that it produces the desired output. `Person` cannot be a concrete class (has to be either an abstract class or an interface). **[4]**

Code:	Desired output:

`public class Q1 {`
`  public static void main(String[] args) {`
`  Person p = new Teacher();`
`  p.eat();`
`  p.work();`
`  Person q = new Teacher();`
`  q.eat();`
`  q.work();`
`  Person r = new Student();`
`  r.eat();`
`  r.work();`
`  System.out.println("Total objects created: "`
`  + Person.count);`
`  }`
`}`
	`I am eating.`
	`I need to prepare lectures and questions.`
	`I am eating.`
	`I need to prepare lectures and questions.`
	`I am eating.`
	`I need to study sincerely.`
	`Total objects created: 3`

b) Did you declare Person as an abstract class or an interface? Briefly provide reasoning for your choice. **[1]**

Question 2 [8]

a) Suppose you have a file named "**`data.txt`**". The contents of the file `data.txt` is given below: **[3+2+3]**

data.txt									
1	19.5	8	77	25	27.4	3.99	89	5.35	80

Now, answer the following questions:

I. Create an ArrayList that is filled up by reading the values from the `data.txt` file (your ArrayList should have 10 elements).

II. Create **a second** ArrayList that contains the values of the first ArrayList but in **reversed order** (the first & last element of the second ArrayList will be 80 & 1).

III. Write the contents of the **second** ArrayList in another file named "`reversed.txt`"

Question 3 [3 + 2]

a) The following code generates a Java GUI application like **Figure 1** below. **[3]**
You have to write the event handling code for converting **Euro** to **USD** after pressing the **Get USD Value** button.
Formula: 1 Euro = 1.16 USD

Code:

```
1  public class WorldCurrency extends JFrame{
2      WorldCurrency(String n){
3          setTitle(n);
4          setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
5          setSize(400,200);
6
7          JPanel p = new JPanel();
8          JLabel l1 = new JLabel("Euro:");
9          p.add(l1);
10         JTextField euro = new JTextField("0.0",10);
11         p.add(euro);
12         JLabel l2 = new JLabel("USD:");
13         p.add(l2);
14         JTextField usd = new JTextField("0.0",10);
15         p.add(usd);
16         JButton b = new JButton("Get USD value");
17         p.add(b);
18
19         setContentPane(p);
20         setVisible(true);
21     }
22
23     public static void main(String[] args) {
24         new WorldCurrency("Currency Converter");
25     }
26 }
```

Figure 1:

b) Is there anything wrong with the following code? Explain your answer and rewrite the correct code. **[2]**

```
try{
    riskyMethod();
}catch (Exception e){
    System.out.println(e);
}catch (ArrayIndexOutOfBoundsException e){
    System.out.println(e);
}
```

Question 4 [3 + 2 + 2]

a) Write the output of the following code. **[3]**

```
public class Main {
    public static void main(String[] args) {
        int v1 = 4;
        int v2 = -2;
        try {
            try {
                test(v1);
                return;
            } catch (ArithmeticException e) {
                System.out.println("Inner catch: " + e.getMessage());
                test(v2);
            } finally {
                System.out.println("I don't care about exceptions");
            }
        } catch (Exception e) {
            System.out.println("Outer catch: " + e.getMessage());
        }
    } // End of main function
```

[The code is continued in the next page]

```
    // rest of Main class
    static void test(int a) {
        testException(a);
        return;
    }

    static void testException(int a) {
        if (a < 0) {
            throw new NumberFormatException("Negative value not allowed");
        } else if (a % 2 == 0) {
            throw new ArithmeticException("Even integer found");
        } else {
            System.out.println("Input " + a);
        }
    }
}
```

b) Compute the output of the following code if **first** input is **your name** and **second** input is **your ID**. **[2]**

```
public class Q2 {
    private String ID, name;
    Q2() {
        Scanner s = new Scanner(System.in);
        name = s.nextLine();
        ID = s.nextLine();
        Inner inner = new Inner();
        inner.display();
    }
    class Inner {
        public void display() {
            System.out.println("ID is " + ID + ", name is: " + name);
        }
    }
    public static void main(String[] args) {
        Q2 q2 = new Q2();
    }
}
```

c) Compute the output of the following code. Will the code work if we uncomment the line `// ref.msg2()` in the main method? If not, why? **[2]**

```
interface A {
    void msg1();
}
class B implements A {
    public void msg1() {
        System.out.println("In msg1: B");
    }
    public void msg2() {
        System.out.println("In msg2: B");
    }
}
```

```
public class Q3 {
    public static void main(String[] args) {
        A ref = new A() {
            public void msg1() {
                System.out.println("In msg1: anonymous class");
            }
        };
        ref.msg1();
        // ref.msg2();
    }
}
```