United International **University (UIU)**
Dept. of Computer Science & Engineering (CSE)
***Midterm Exam* :: Trimester: Summer - 2020**
Course Code: CSE 1115 Course Title: Object Oriented Programming
Total Marks: **20** Duration: **1 hour**

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

Answer all the questions

Question 1 [Marks: 2 + 3]

A. The following code contains 4 errors. Fix the errors so that the code runs correctly. **[2]**
Note that: You do **not** need to rewrite the full code. You can only write the lines where changes should be made. Also you can not **remove any lines** from the given code. You can add lines or modify existing lines.

```
package living;

class Animal{
    String type;
    int age;
}
```

```
package zoo.exotic;

class Tiger extends Animal{
    String region;

    void display(){
        System.out.println("This is a " + type);
        System.out.println("It's age is " + age);
        System.out.println("It lives in " + region);
    }
}
```

B. Complete the **Child** class in the following code, so that the code produces the given output. You **can not remove** any lines form the code. You also **can not add** any instance variables to the classes. **[3]**

```
class Parent{
    private int var1;
    private int var2;

    public Parent(int var1, int var2) {
        this.var1 = var1;
        this.var2 = var2;
    }

    void display(){
        System.out.println(var1 + " " + var2);
    }
}
```

```
class Child extends Parent{
    int var3;

    // Your code here

    void display(){
        // Your code here
        System.out.println(var3);
    }
}
```

```
class Main{
    public static void main(String[] args) {
        Child childObj = new Child(10, 20, 30);
        childObj.display();
    }
}
```

Output:
10 20
30

Question 2 [Marks: 1 + 2 + 2]

A. Consider the following function: **[1]**

```
void mySuperFunction(String s1, int i2){ ... }
```

Write a function that has the **same signature** as the given function. Also write another function that has **different signature**.

B. Consider the following code and answer these questions: **[2]**

i. What is the output of the following code?

ii. Will the code work if we **uncomment** the line **`bird.speak("HELLO WORLD!")`**? Why or why not?

```
class Bird{
    void fly(){
        System.out.println("Bird is flying");
    }
}

class Main{
    public static void main(String[] args) {
        Bird bird = new Parrot();
        bird.fly();
        // bird.speak("HELLO WORLD!")
    }
}
```

```
class Parrot extends Bird{
    void fly(){
        System.out.println("Parrot is flying");
    }
    void speak(String line){
        System.out.print("Parrot is speaking: ");
        System.out.println(line);
    }
}
```

C. Create a student array (named **students**) in the following code in such a way so that it produces the given output. You can not remove any lines from the code. **[2]**

```
class Student{
    String name;
    double cgpa;

    public Student(String name, double cgpa) {
        this.name = name;
        this.cgpa = cgpa;
    }
}
```

```
class Test{
    public static void main(String[] args) {
        /*
            Your code here
         */

        for(Student student: students){
            System.out.println(student.name + " " + student.cgpa);
        }
    }
}
```

Output:

```
Bashar 3.78
Khaled 3.66
Rafiq 3.7
```

Question 3 [Marks: 5]

Carefully consider the following program. **[1.5 + 3.5]**

i. What is the output of the following code?

ii. Draw the reference diagrams (a diagram which shows the objects and their corresponding references) after each of the **lines with a comment at the end** inside main.

```
class TV{
    int id;
    String brandName;
    double marketValue;

    TV(int id, String brandName, double marketValue){
        this.id = id;
        this.brandName= brandName;
        this.marketValue = marketValue;
    }

    void updatePrice(double value){
        marketValue = value;
    }
}
```

```
public class Main {
    public static void main (String[] args){
        TV rA = new Refrigerator(1, "Samsung", 40000.0);
        TV rB = new Refrigerator(2, "Sony", 38000.0);
        TV rC;
        rC = rB;    // i
        rB = new TV(5, "Walton", 30000.0);
        rC = rA;    // ii
        rA = new TV(2, "LG", 42000.0);
        rB.updatePrice(rC.marketValue);    // iii

        System.out.println(rA.id+" "+rB.id+" "+rC.id);

        rA = rB;    // iv
    }
}
```

Question 4 [Marks: 5]

Fix the **error(s)** of the following code and then write down the **output**. **[5]**

You **cannot** remove any line of code. You can **only add** lines/methods to the following code. Write down **only the added lines** and the **final output** in your answer script. **You do not need to write the entire code**.

```
class Currency{
    public String country;
    public double amount = 2000.0;
    public boolean isAvailable;

    public Currency(double val) {
        amount = val;
    }

    public void addVal(double c) {
        amount += c;
    }

     public void addAmount(double c, double amount){
        amount += c;
    }

    public double getAmount() {
        return amount;
    }
}

public class ConsMain {
    public static void main(String[] args) {
        Currency X = new Currency();
        Currency Y = new Currency(1000.0);
        Currency Z = new Currency(true);

        X.addVal(5000.0);
        Y.amount += 2000.0;
        Z.addAmount(3000.0, 1000.0);
        System.out.println(X.getAmount()+ " " + X.isAvailable);
        System.out.println(Y.getAmount()+ " "+ Y.isAvailable);
        System.out.println(Z.getAmount()+ " "+ Z.isAvailable);
    }
}
```