Question 1 (6 Marks)

- Find and fix an error that prevents the following piece of code from running successfully.

```
1     public static void main(String[] args) {
2         int age;
3         double weight = 70;
4         String name = "Tim";
5         System.out.println("Name"+name);
6         System.out.println("age="+age);
7         System.out.println("Wright="+weight);
8         age=23.5;
9         weight=weight+"5";
10    }
```

The first 4 errors prevent the code from running successfully. Error 5 and error 6 do not prevent the code from running but prevent us from getting the desirable output.

1. This code did not declare a class.
2. As 23.5 is a decimal number with fraction, the data type of age should be double instead of int. If age is declared with data type int, it can only store integer values. However, data type double can store floating-point real numbers.
3. As the variable age is declared inside the main method, it is a local variable. Local variables have to be initialised before being used.
4. "5" is a string instead of an integer, weight is initialised as 70, which is a number. It is not correct to add a number and a string. Therefore, we should write 5 instead of "5".
5. There is a typo "Wright" inside the code, but it does not prevent the code from running normally.
6. Although the code runs normally with the statement weight=weight+5; written below "System.out.println("Weight="+weight);", we cannot get the desirable output of the value of weight because Java statements parse from the top to the bottom of the program. Therefore, we should write weight=weight+5; before we print the value.

The following is the code that I revised, which runs successfully.

```
public class AgeWeight {
    public static void main(String[] args) {
        double age;
        age=23.5;
```

```
        double weight=70;
        weight=weight+5;
        String name="Tim";
        System.out.println("Name: "+name);
        System.out.println("age="+age);
        System.out.println("weight="+weight);
        }
}
```

note:
It is the best that we add : sign and space to the right of "Name" (as above).
Otherwise, if we use the original code, we will get NameTim.

Question 2 (11 Marks)

Assume you have a class with a double instance variable named ‘itemPrice’.

- Develop a setter (mutator) for the variable described above that must accept only values between 0.9 and 15.5

```
public void setItemPrice (double newItemPrice){
    if (newItemPrice >= 0.9 && newItemPrice <= 15.5){
        itemPrice = newItemPrice;
    }
}
```

Question 3 (3 Marks)

Briefly explain the differences between Classes and Objects in Java OOP. Support your answer with an example.

Basically, objects are instances of a class. For example, we declare a class called animal. In this class, there are lots of different animals, such as rabbit, dog, cat, elephant, lion and so on. All these different animals are objects of the animal class. In other word, rabbit is an object of the animal class, dog is an object of the animal class, cat is an object of the animal class, elephant is an object of the animal class, and lion is an object of the animal class.

The animal class contains many attributes (instance variables) such as name, gender and hometown. Each object of this class can have different states (or values) of these attributes. For example, for the object rabbit, its name is Alice, gender is female and its hometown is North America. For the object dog, its name is Ben, gender is male and its hometown is Australia. Then we will get the following:

For object rabbit:

name="Alice" gender="female" hometown="North America"

For the object dog:

name="Ben" gender="male" hometown="Australia"