

ID # 16236 .

MID TERM ASSIGNMENT

Object Oriented Programming
BS (SE) SEC (A)

Instructor : Sir Ayub Khan.

(2)

Question # 1

Q. What is class and role of object in a class? Explain in detail with the help of a suitable program.

Ans. Classes AND Objects in Java :-

Classes and objects are basic concepts of object oriented programming which revolve around the real life entities.

Class :-

A class is a user defined blueprint or prototype from which objects are created. It represents the set of properties or methods that are common to all objects of one type. In general, class declarations can include these components, in order:

- Modifiers
- Class name
- Super class (if any)
- Interfaces
- Body.

(3)

- **Modifiers :** A class can be public or has default access (Refer this for details).

- **Class name :-** The name should begin with a initial letter (Capitalized by convention).

- **SuperClass(if any) :-** The name of the class's parent (super class), if any, preceded by the keyword extends. A class can only extend (subclass) one parent.

- **Interfaces(if any) :** A comma-separated list of interfaces implemented by the class, if any, preceded by the key-word implements. A class can implement more than one interface.

- **Body :** The class body surrounded by braces, { }.

(4)

Constructors are used for initializing new objects. Fields are variables that provides the state of the class and its objects, and methods are used to implement the behaviour of the class and its objects.

There are various types of classes that are used in real time applications such as. nested classes, anonymous classes, lambda expressions.

• Role of object in a Class :

Objects are created from a class. Before creating an object, we need to define a class. A class represents the set of properties or methods that are common in to all objects.

An object is an element (or instance) of a class, objects have the

5

behaviours of their class. The Object is the actual component of programs, while the Class specifies how instances are created and how they behave.

```
Executo | > Share Source File STUIN
1 //CODE TO SHOW EXAMPLE OF CLASS AND ITS OBJECTS (ALI RAZA-10236)
2 public class classAll
3 {
4     int v1 = 17; //PUBLIC VARIABLE IN CLASS
5     int v2 = 49; //PUBLIC VARIABLE IN CLASS
6     public static void main(String[] args)
7     {
8         classAll simpleObj1 = new classAll(); //CREATING A SIMPLE NEW OBJECT IN
          THE MEMORY
9         classAll simpleObj2 = new classAll(); //CREATING ANOTHER SIMPLE NEW
          OBJECT IN THE MEMORY
10        System.out.println(simpleObj1.v1); //PRINTING CLASS MEMBER THROUGH
          OBJECT ONE
11        System.out.println(simpleObj2.v2); //PRINTING CLASS MEMBER THROUGH
          OBJECT SECOND
12    }
13 }
```

```
$javac classAll.java
$java -Xmx128M -Xms16M classAll
17
49
```



Q2

QUESTION NO '2'

Q2 - Write a program about table printing which takes input from the User on the basis of OOP and Explain in detail.

```
1 //code for multiplication of a digit input by user. question 2 (Ali Raza 16236 - BSSE)
2 import java.util.*;
3
4 public class multiplicationTable
5 {
6     //here we write a class and add all necessary coding to print out table of the required digit
7     public static void main(String[] args)
8     {
9         Scanner req = new Scanner(System.in); //req is the object for the user input digit
10        int v1;
11        System.out.print("Enter a number for which the multiplication table is required : ");
12        v1 = req.nextInt();
13
14        System.out.print("\n");
15
16        for (int i=0; i< 16; i++)
17        {
18            System.out.println(v1 + " x " + (i+1) + " = " +
19                (v1 * (i+1)));
20        }
21    }
22 }
```


Result

CPU Time: 0.40 sec(s), Memory: 39880 kilobyte(s)

Enter a number for which the multiplication table is required :

$$12 \times 1 = 12$$

$$12 \times 2 = 24$$

$$12 \times 3 = 36$$

$$12 \times 4 = 48$$

$$12 \times 5 = 60$$

$$12 \times 6 = 72$$

$$12 \times 7 = 84$$

$$12 \times 8 = 96$$

$$12 \times 9 = 108$$

$$12 \times 10 = 120$$

$$12 \times 11 = 132$$

$$12 \times 12 = 144$$

$$12 \times 13 = 156$$

$$12 \times 14 = 168$$

$$12 \times 15 = 180$$

$$12 \times 16 = 192$$

Question No (3)

Q3- Write a program about any 2 cars which can calculate the performance of both of them and Explain in detail.

```
1 import java.util.*;
2 public class aliRaza {
3     public static void main(String[] args) {
4         ac toyota= new ac();
5         Scanner req= new Scanner(System.in);
6         System.out.println("Enter the no. of passesngers ");
7         toyota.pass=req.nextInt();
8         System.out.println("Enter the Fuel Capacity of the plane");
9         toyota.fcap=req.nextDouble();
10        System.out.println("Enter the Fuel Consumption of the plane");
11        toyota.fc=req.nextDouble();
12        System.out.println("No of passesngers: "+toyota.pass);
13        System.out.println("Total Fuel Capacity: "+toyota.fcap);
14        System.out.println("Fuel Consumption: "+toyota.fc);
15        System.out.println("Car performance: "+toyota.perfo());
16        System.out.println("Running time of the car: "+toyota.ft(3.5));
17    }
18 }
```

```
19 class ac
20 {
21     int pass;
22     double fcap;
23     double fc;
24     double perfo()
25     {
26         double p;
27         p= fcap/fc;
28         return p;
29     }
30     double ft(double t)
31     {
32         return fc*t ;
33     }
34 }
35
```

Result

CPU Time: 0.30 sec(s), Memory: 37608 kilobyte(s)

```
Enter the no. of passesngers
Enter the Fuel Capacity of the plane
Enter the Fuel Consumption of the plane
No of passesngers 5
Total Fuel Capacity 120.0
Fuel Consumption 30.0
Car performance 4.0
Running time of the car105.0
```