

Q.1. Choose the correct option for the following questions

(10 x 1 = 10 Marks)

1) Which statement best describes a computer program?

- a) A program is a sequence of comments.
- b) A program can decide what task it is to perform.
- c) A program is a sequence of instructions and decisions that the computer carries out.
- d) A program can only perform one simple task.

2) private instance variables \_\_\_\_\_ .

- a) can only be accessed by methods of a different class.
- b) can only be accessed by methods of the same class.
- c) cannot be accessed by methods of the same class.
- d) can only be accessed by the constructor of the class.

3) What do static variables belong to?

- a) a method.
- b) a class.
- c) an object.
- d) a package.

4) A method which changes state of its implicit parameter is known as \_\_\_\_\_ .

- a) Accessor.
- b) Mutator.
- c) Constructor.
- d) None of the above.

5) Constructors contain instructions to \_\_\_\_\_ .

- a) Print the instance variables of an object.
- b) Create the instance variables of an object.
- c) Initialize the instance variables of an object.
- d) None of the above.

6) Which is the correct version of Java code construction an object of class Rectangle, and for declaring an object variable of class Rectangle.

- a) `Rectangle box = new Rectangle();`
- b) `Rectangle box = new Rectangle(5, 10, 20, 30);`
- c) `Rectangle box = new Rectangle(5, 10);`
- d) All of the above.

7) Which of the following is the correct syntax for if statement?

```
int x = 5; String size = "";
```

- a) `if (x < 10) { size = "Small";}`  
`else (x < 20) { size = "Medium";}`
- b) `if (x < 10); { size = "Small";}`  
`else (x < 20) { size = "Medium";}`
- c) `if (x < 10) { size = "Small";}`  
`else { size = "Medium";}`
- d) `if { size = "Small";}`  
`else (x < 20) { size = "Medium";}`

8) Which of the following values does not have a primitive data type?

- a) 12.50
- b) "Hello"
- c) 6
- d) 1E4

9) Which java statements change the string "SEU" to "seu".

- a) `"SEU".replace("SEU", "seu")`
- b) `"SEU".toLowerCase()`
- c) All of the above.
- d) None of the above.

10) What kind of operator is the `<=` operator?

- a) Boolean
- b) Arithmetic
- c) Inequality
- d) Relational

Q.2. Write True/False for the following statements.

(5 x 1 = 5 Marks)

S.No.		Write T/F
1.	Encapsulation is the process of hiding object data and providing methods for data access.	(T)
2.	In Java, the garbage collector periodically reclaims objects when they are no longer used.	(T)
3.	java.util package is automatically imported in any Java program.	(F)
4.	Every statement with if must also include else.	(F)
5.	Invoking a method means asking the method to do its job	(T)

Q.3. Write short answer for the following questions.

(3 x 5 = 15 Marks)

- 1) Suppose your cell phone carrier charges you \$29.95 for up to 300 minutes of calls, and \$0.45 for each additional minute, plus 12.5 percent taxes and fees. Give an algorithm to compute the monthly charge for a given number of minutes.

Answer:

Is the number of minutes at most 300?

a. If so, the answer is  $\$29.95 \times 1.125 = \$33.70$ .

b. If not,

1. Compute the difference: (number of minutes)-300.

2. Multiply that difference by 0.45.

3. Add \$29.95.

4. Multiply the total by 1.125.

2) Define Identifier. List out 3 rules, which are to be followed to declare an identifier.

**Identifier:** name of a variable, method, or class.

**# Rules for identifiers in java:**

- Can be made up of letters, digits, and the underscore (`_`) and dollar sign (`$`) characters.
- Can't start with a digit.
- can't use other symbols such as `?` or `%`
- Spaces are not permitted inside identifiers
- You can't use reserved words such as `public`
- They are case sensitive

3) What is this reference? What is the difference between instance variable and instance of class?

**# The this reference** denotes the implicit parameter.

**# Instance of a class:** an object of the class. The class declaration specifies the instance variables.

**# Instance variables:** store the data of an object. An instance variable declaration consists of: access specifier (`private`), type of variable (such as `int`), name of variable (such as `value`).

#### Q.4 Java sample code analysis

(3 + 2 + 5 = 10 Marks)

1) Find output of the following java code.

```
public class Circle{
    double radius = 1;
    public static final double PI = 3.14;
    public static void main(String[] args){
        double volume = PI * radius * radius;
        System.out.println(volume);
    }
}
```

Output: variable **radius** can't be referenced from a **static** context. "Compile-time error"

Otherwise:

```
public class Circle{
    public static final double PI = 3.14;
    public static void main(String[] args){
        double radius = 1;
        double volume = PI * radius * radius;
        System.out.println(volume);
    }
}
```

Output: 3.14

2) Find output of the following java code.

```
public class Test{
    public static void main(String[] args)
    {
        int value = 20;
        value = value * 2;
        value--;
        System.out.println(value);
    }
}
```

Output: 39

3) Find syntax errors in the following java code. (Denote errors with circle)

```
public class test1{
    public Static void main(String[] a){
        int x = 30;
        byte y = 10;

        if(x = 30){
            if(y > 10){
                system.out.print("X = 30" + and Y > 10");
            }else (y == 10) {
                System.out.print("X = 30 and Y = 10");
            }
        }
    }
}
```

```
public class Test1{
    public static void main(String[] a){
        int x = 30;
        byte y = 10;

        if(x == 30){
            if(y > 10){
                System.out.print("X = 30 + and Y > 10");
            }else {
                System.out.print("X = 30 and Y = 10");
            }
        }
    }
}
```

Q.5. Write a program in java to read three numbers from the user and print the largest number.

(10 Marks)

```
import java.util.Scanner;
public class Test
{
    public static void main(String[] args)
    {
        Scanner input = new Scanner(System.in);
        double num1;
        double num2;
        double num3;

        System.out.println("Enter three different numbers to find largest of them");
        System.out.print("Enter first number: ");
        num1 = input.nextDouble();
        System.out.print("Enter second number: ");
        num2 = input.nextDouble();
        System.out.print("Enter third number: ");
        num3 = input.nextDouble();

        if ( num1 > num2 && num1 > num3 ){
            System.out.println("First number is largest.");
        }
        else if ( num2 > num1 && num2 > num3 ){
            System.out.println("Second number is largest.");
        }
        else if ( num3 > num1 && num3 > num2 ){
            System.out.println("Third number is largest.");
        }
        else {
            System.out.println("All numbers are equal");
        }
    }
}
```

Output:

```
Enter three different numbers to find largest of them
Enter first number: 10
Enter second number: 20
Enter third number: 30
Third number is largest.
```