

Unique Paper Code	:	32341201_OC
Name/Title of the paper	:	Programming in Java-OC
Name of the Course	:	B. Sc. (H) Computer Science
Semester	:	II
Year of Admission	:	2015, 2016, 2017, 2018
Duration of Examination	:	3 Hours
Maximum Marks	:	75

Instructions for Candidates

1. Attempt any FOUR out of SIX questions.
2. All questions carry equal marks.
3. All parts of a question must be answered together.
4. The data types of variables/data members/arrays and return types of the methods should be clearly stated.

Q1. Assuming all necessary packages imported (where required) in the following Java code snippets, write the output and **explain your answer**.

```
i) public class ArrQ {
    int v1;
    int v2;
    public void meth1() {
        v1 = 0;
        v2 = 0;
        int[] v3 = { 0 };
        meth2(v2, v3);
        System.out.println(v1+" "+v2+" "+v3[0]+" ");
    }
    public void meth2(int v2, int[] v3) {
        v1 = 1;
        v2 = 1;
        v3[0] = 1;
    }
    public static void main(String[] args) {
        ArrQ aq = new ArrQ();
        aq.meth1();
    }
}

ii) public class ExcepHand {
    public static void main(String[] args) {
        try {
            meth1();
        } catch (InterruptedException ie) {
            System.out.println("A");
            throw new RuntimeException();
        } catch (RuntimeException ie) {
            System.out.println("B");
            return;
        } catch (Exception ie) {
            System.out.println("C");
        } finally {
            System.out.println("D");
        }
        System.out.println("E");
    }
    static void meth1() throws InterruptedException {
        throw new InterruptedException("Demo");
    }
}
```

```

iii) public class A {
    public static void main(String[] args) {
        double d=0x27.2p2;
        int i=(int)d;
        d=d%0b1010;
        System.out.println("Value of d is " + d);
        System.out.println("Value of i is " + i);
    }
}

iv) public class StaticClass {
    static int v1 = 3;
    static int v2;
    static void methStatic (int x) {
        System.out.println("x : " + x);
        System.out.println("v1 : " + v1);
        System.out.println("v2 : " + v2);
    }
    static {
        System.out.println("Static block");
        v2 = v1 + 5;
    }
    public static void main(String args[]) {
        methStatic(11);
    }
}

public class StaticTest {
    static int v1 = 31;
    static int v2 = 28;
    static void methStatic () {
        System.out.println("v1 : " + v1);
    }
    public static void main(String args[]) {
        StaticTest.methStatic();
        StaticClass.methStatic(42);
        System.out.println("v2 : " + v2);
        System.out.println("StCls.v2:" + StaticClass.v2);
    }
}

```

```
v) public class B {
    public static void main(String args[]) {
        int iarr[][] = {{5, 7}, {6, 8}};
        int a, b;
        for (a = 1; a > -1; a--) {
            for (b = 1; b > -1; b--) {
                System.out.print(iarr[b][a]);
            }
        }
    }
}
```

Q2. Consider the following table:

Number of units consumed	Rate
1-100	Rs 500/- rental charges only
101-200	Rs 1.00 per unit + rental charges of Rs 500
201-300	Rs 1.20 per unit + rental charges of Rs 500
Above 300	Rs 1.50 per unit + rental charges of Rs 500

Write a program in Java that does the following:

- Defines a class **ElectricityBill** having five private instance variables storing consumer details: **consumerNo**, **consumerName**, **consumerAge**, **consumerAddress**, **numUnitsConsumed**; a private class variable **count** (that keeps the count of total number of instances), all having appropriate data types.
- Defines a parameterized constructor; and three methods- **display()** for displaying consumer details; **calculate()** for computing the monthly bill according to the units consumed as per the following table and display the total amount to be paid and **displayCount()** to display the total number of consumers (instances of the class).
- The program should be able to raise an exception **NegativeAgeException** if the age entered by the user is negative. The exception should be handled by displaying a message "Error: Age cannot be negative!" on the screen and the program should end.
- Defines a driver class **Demo** having **main()** method with appropriate code to show working of the above classes.

Q3. a. Assuming all necessary packages imported in the following Java code, identify the errors and rewrite the rectified code. **Explain your answer.**

```
public class VarInit {
    int v1, v2 = 0;
    static int v3;
    public static void main(String[] args) {
        int v4;
        int v5 = 0;
        v1++; v2++;
        v3++; v4++;
    }
}
```

- b. Java implements a controlled version of global methods and global variables with the help of static methods and variables. Explain the statement.
- c. What is multiple inheritance? Why does Java not support it? Explain the workaround with an example.
- Q4. a. Write a multithreaded program in Java to take n integers from the user. Two threads are then created. The first thread prints even integers on the console and the second thread writes odd integers to a text file.
- b. Using Java AWT, write a program that does the following:
- Creates a frame titled **"My_New_Frame"** having two fields to add `UserId` and `Password`. If the user types in correct user id and correct password, display a message **"Successful"** inside the frame otherwise display **"Invalid Credentials"**.
 - Using appropriate adapter class to display the message **"Typed character is: <typedCharacter>"** in the frame window when user types any key.

- Q5. Write a program in Java that accepts words through command line and works as follows:
- If the number of arguments is equal to five, it should sort them in alphabetical order and print it in a file named **file1.txt**.
 - If the number of arguments is equal to zero, then the program should ask the user to enter a sentence of five words, sort the words in alphabetical order and print it on console.
 - If the number of arguments is neither five nor zero, then the exception raised should be handled by the program and a message **"Error: Number of arguments is not valid!"** is displayed on the screen and the program ends.

- Q6. a) Consider the following incomplete Java code snippet.

```
int index = 10;
for(int x = 2; x <= index; x++) {
    ...
}
```

Write Java statements inside the above for loop to generate the formatted output as mentioned below.

2	4	6	8	10
4	8	12	16	20
6	12	18	24	30
8	16	24	32	40
10	20	30	40	50

- b) Write Java statements/prototype for the following tasks:
- a method that accepts a character, an array of integers and has void as a return type.
 - a while loop that reads some words from the keyboard till ^z is entered and displays each word per row.

- iii) A single statement that compares values of two numbers stored in variables **u** and **v** and stores incremented value of the greater number in the variable **w** by making use of unary increment operator and ternary operator.