Time limit 2h

Technical Interview, (Backend Developer Java)

The goal of the next assessment is to have a taste about how much you love to code and your passion about clean, reusable and comprehensive code.
Please answer as honest as the day is long :-)

Multiple-choice questions, only one answer is correct:

1. What is the output of the next code:

```
class Base {
   final public void show() {
      System.out.println("Base::show() called");
   }
}

class Derived extends Base {
   public void show() {
      System.out.println("Derived::show() called");
   }
}

class Main {
   public static void main(String[] args) {
      Base b = new Derived();;
      b.show();
   }
}
```

A) Base::show() called
B) Derived::show() called
C) Compiler Error
D) Runtime Error

2. What is the output of the next code:

```
class Base {
   public void Print() {
      System.out.println(""Base"");
   }
}

class Derived extends Base {
   public void Print() {
      System.out.println(""Derived"");
   }
}

class Main{
   public static void DoPrint( Base o ) {
      o.Print();
   }
```

```
    public static void main(String[] args) {
        Base x = new Base();
        Base y = new Derived();
        Derived z = new Derived();
        DoPrint(x);
        DoPrint(y);
        DoPrint(z);
    }
}
```

A)
Base
Derived
Derived

B)
Base
Base
Derived

C)
Base
Derived
Base

D)
Compiler Error
Java Inheritance

3. What is the output of the next code:

```
class Test {
   public static void main(String args[]) {
     int arr[2];
     System.out.println(arr[0]);
     System.out.println(arr[1]);
   }
}
```

A)
0
0

B)
garbage value
garbage value

C)
Compiler Error

D)
Exception

4. What is the output of the next code:

```
public class Main {
    public static void main(String args[]) {
        int arr[][] = new int[4][];
        arr[0] = new int[1];
        arr[1] = new int[2];
        arr[2] = new int[3];
        arr[3] = new int[4];

        int i, j, k = 0;
        for (i = 0; i < 4; i++) {
            for (j = 0; j < i + 1; j++) {
                arr[i][j] = k;
                k++;
            }
        }
        for (i = 0; i < 4; i++) {
            for (j = 0; j < i + 1; j++) {
                System.out.print("" "" + arr[i][j]);
                k++;
            }
            System.out.println();
        }
    }
}
```

A) Compiler Error

B)

```
0
 1 2
 3 4 5
 6 7 8 9
```

C)

```
0
 0 0
 0 0 0
 0 0 0 0
```

D)

```
 9
 7 8
 4 5 6
 0 1 2 3
```

5. What is the output of the next code:

```
final class Complex {
    private  double re,  im;
    public Complex(double re, double im) {
        this.re = re;
        this.im = im;
    }
    Complex(Complex c)
    {
      System.out.println(""Copy constructor called"");
```

```
        re = c.re;
        im = c.im;
    }
    public String toString() {
        return ""("" + re + "" + "" + im + ""i)"";
    }
}
class Main {
    public static void main(String[] args) {
        Complex c1 = new Complex(10, 15);
        Complex c2 = new Complex(c1);
        Complex c3 = c1;
        System.out.println(c2);
    }
}
```

A)

Copy constructor called
(10.0 + 15.0i)

B)

Copy constructor called
(0.0 + 0.0i)

C)

(10.0 + 15.0i)

D)

(0.0 + 0.0i)

6. What is the output of the next code:

```
class Test
{
    public static void main(String[] args)
    {
        try
        {
            int a[]= {1, 2, 3, 4};
            for (int i = 1; i <= 4; i++)
            {
                System.out.println ("a[" + i + "]=" + a[i] + "n");
            }
        }

        catch (Exception e)
        {
            System.out.println ("error = " + e);
        }

        catch (ArrayIndexOutOfBoundsException e)
        {
            System.out.println ("ArrayIndexOutOfBoundsException");
```

```
    }
  }
}
```

A) Compiler error
B) Run time error
C) ArrayIndexOutOfBoundsException
D) Error Code is printed
E) Array is printed

"

7. The built-in base class in Java, which is used to handle all exceptions is

A) Raise
B) Exception
C) Error
D) Throwable

8. What is the output of the next code:

```
class Test {
public static void swap(Integer i, Integer j) {
    Integer temp = new Integer(i);
    i = j;
    j = temp;
  }
  public static void main(String[] args) {
    Integer i = new Integer(10);
    Integer j = new Integer(20);
    swap(i, j);
    System.out.println(""i = "" + i + "", j = "" + j);
  }
}
```

A) i = 10, j = 20
B) i = 20, j = 10
C) i = 10, j = 10
D) i = 20, j = 20

9. Given a list of employees, print their names separated by “,”

```
import java.util.ArrayList;
import java.util.List;
import java.util.stream.Collectors;

public class MaximumUsingStreamMain {
    public static void main(String args[])
    {
            //Write your code here
```

```
    }

    public static List<Employee> createEmployeeList()
    {
        List<Employee> employeeList=new ArrayList<>();

        Employee e1=new Employee(""John"",21);
        Employee e2=new Employee(""Martin"",19);
        Employee e3=new Employee(""Mary"",31);
        Employee e4=new Employee(""Stephan"",18);
        Employee e5=new Employee(""Gary"",26);

        employeeList.add(e1);
        employeeList.add(e2);
        employeeList.add(e3);
        employeeList.add(e4);
        employeeList.add(e5);

        return employeeList;
    }
}
```

10. This last question is to test your coding skills, please attach your solution in a zip file, and answer in Spanish to the next two questions.

    a. Estructuras de datos utilizadas en el algoritmo
       Una vez realizado el problema del algoritmo, comenta qué estructuras de datos (Listas, Sets, etc...) has seleccionado para resolverlo y porqué la has considerado la más adecuada en cada caso.
    b. Complejidad temporal del algoritmo
       Una vez resuelto el algoritmo, ¿qué complejidad temporal expresada en notación "O" crees que tiene? ¿Consideras que se podría mejorar de alguna manera?

    Siguiente Elemento Mayor
    Dado un array, imprime el Siguiente Elemento Mayor (SEM) para cada elemento.
    El siguiente elemento mayor para un elemento X es el primer elemento mayor en el lado derecho de X en el array.
    Para aquellos elementos en los cuales no existe un elemento mayor, considere el siguiente elemento mayor como -1.

    Ejemplos:
    Para el siguiente array [4, 5, 2, 25] el output sería:
    Elemento SEM
    4 --> 5
    5 --> 25
    2 --> 25

25 --> -1

Para el siguiente array [13, 7, 6, 12] el outpur sería:

Elemento SEM

13 --> -1

7 --> 12

6 --> 12

12 --> -1