The Department of Computer Science Java Programming is wonderful
Attempt all questions (which are not equally weighted) Time allowed 3 hours

Question1: Multiple choice questions [Total 40 Marks]

Note:- In each sub question there is exactly one correct answer. You are required to write the correct answer in column two of the table which can be found on last page. Make sure you write your name and seat number on that page too. Also sign the last page. You are not suppose to detached this page from the rest of the pages during first fifty minutes. After fifty minutes detached and return to the approaching invigilator.

Question 1a

What will happen if you compile/run this code?

```
class Q1a {
    public void run(int count) {
        System.out.println("I am sad because count is " + count);
        count--;
        if (count > 0)
            run(count);        // this is line number 6
        System.out.println("I am happy because count is " + count);
    }
    public static void main(String[] args) {
        Q1a q1a = new Q1a( );
        q1a.run(2);
    }
}
```

A) Compilation error at line 6.

B) Runtime exception at line 6.

C) Prints following lines:

I am sad because count is 2

I am happy because count is 1

D) Prints

I am sad because count is 2
I am sad because count is 1
I am happy because count is 0
I am happy because count is 1

Question 1b

The following code will give

```
class Q1b {
    public static void main(String [] args){
        String s1 = "127";
        String s2 = new String("127");
        if(s1 == s2)
```

```
            System.out.println("True");
        else
            System.out.println("False");
    }
}
```

A) Compilation error, s1 == s2 is not legal for String.
B) Prints "True".
C) Prints "False".

Question 1c

```
//What will happen if you compile/run the following code?
public class Q1c  {
    static String str1 = "main method with String[] args";
    static String str2 = "main method with int[] args";
    public static void main(String[] args)  {  // this is line 4
        System.out.println(str1);
    }
    public static void main(int[] args)      {  // this is line 7
        System.out.println(str2);
    }
}
```

A) Duplicate method main(), compilation error at line 4.
B) Duplicate method main(), compilation error at line 7.
C) Prints - main method with String[] args.
D) Prints - main method with int[] args.

Question 1d

What will happen if you compile/run the following code?

```
public class Q1d  {
    int maxElements;    // this is line 2
    public Q1d( ) {
        maxElements = 100;
        System.out.println(maxElements);
    }
    public Q1d(int i)  {
        maxElements = i;
        System.out.println(maxElements);
    }
    public static void main(String[] args)  {
        Q1d  a = new Q1d( );  // this is line 12
        Q1d  b = new Q1d(999);
    }
}
```

A) Prints 100 and 999.
B) Prints 999 and 100.
C) Compilation error at line 2, variable maxElements was not initialized
D) Compillation error at line 12.

Question 1e

What will happen if you compile/run the following lines of code?

```
class Q1e {
    public static void main(String [] args){
            int[] iArray = new int[15];
            iArray.length = 10;     // this is line number 4
            System.out.println(iArray.length);
    }
}
```

A) Prints 10.
B) Prints 15.
C) Compilation error, you can't change the length of an array.
D) Runtime exception at line 4.

Question 1f

What will be output by the following code?

```
public class Q1f {
   public static void main(String argv[]){
      int i;
      int j;
      outer:
      for (i = 2; i < 4; i++) {
         inner:
         for(j = 1; j < 3; j++) {
            if (i == 2)
               continue outer;
            System.out.println("Value for i=" + i + " Value for j=" +j);
         }
      }
   }
}
```

A) Value for i=1 value for j=1
B) Value for i=3 value for j=1
C) Value for i=3 value for j=2
D) Value for i=3 value for j=1
   Value for i=3 value for j=2

Question 1g

If you run the code below, what gets printed out?

```
public class Q1g {
   public static void main(String argv[]){
            String s=new String("ToyotaBicycle");
            int iBegin = 1;
            int iEnd = 3;
            System.out.println(s.substring(iBegin, iEnd));
    }
}
```

A) oy
B) yo
C) yota
D) oyo

Question 1h

Given the following code what will be output?

```
public class Q1h {
   static int j = 40;
   public static void main(String argv[]){
      int i = 10;
      Q1h p = new Q1h( );
      p.amethod(i);
      System.out.print (i + " and ");
      System.out.println(j);
   }

   public void amethod(int x){
      x = x * x;
      j = j * x;
   }
}
```

A) Error: amethod does not contain variable j
B) 10 and 40
C) 10 and 4000
D) 10, and 20

Question 1i

What code placed before the comment // Start For loop would result in the population of every element of the array ia[ ] with a value from variable i ?

```
public class Q1i {
   public static void main(String argv[ ]){
      Q1i l = new Q1i( );
      l.amethod( );
   }
   public void amethod( ){
      int ia[] = new int[4];

                                          //Start For loop
      {
         ia[i]=i;
         System.out.println(ia[i]);
      }
   }
}
```

A) for(int i=0; i < ia.length() -1; i++)
B) for (int i=0; i< ia.length(); i++)
C) for(int i=1; i < 4; i++)
D) for (int i = 0; i < ia.length; i++)

Question 1j

What will be the result when you attempt to compile this program?

```
public class Q1j {
   public static void main(String argv[ ]){
      double iRand;
      iRand = Math.random( );
      System.out.println(iRand * 100);
   }
}
```

A) A random number between 0 and 10

B) A random number between 0 and 100

C) A random number between 0 and 1

D) A compile time error about random being an unrecognised method

Question 1k

What will happen when you compile and run the following code?

```
public class Q1k {
   private static int i;
   public static void main(String argv[]){
      Q1k s = new Q1k( );
      s.amethod( );
   }//End of main
   public static void amethod( ){
      System.out.println(i);
   }//end of amethod
}//End of class
```

A) A value of 0 will be printed out

B) Nothing will be printed out

C) A runtime exception will be thrown

D) A compile time error complaining of the scope of the variable i

Question 1l

What will happen when you attempt to compile and run the following code

```
class Q1l extends Base {
   public static void main(String argv[ ]) {
      Q1l o = new Q1l( );
      int iBase=0;
      o.amethod(iBase);
   }
   public void amethod(int iOver) {
      System.out.println("Over.amethod");
   }
}
class Base {
   private void amethod(int iBase) {
      System.out.println("Base.amethod");
   }
}
```

check?

A) Compile time error complaining that Base.amethod is private
B) Runtime error complaining that Base.amethod is private
C) Output of "Base.amethod"
D) Output of "Over.amethod"

Question 1m

What will happen when you attempt to compile and run the following code

```
public class Q1m {
  public static void main(String argv[]) {
     Q1m q1m= new Q1m( );
     q1m.amethod( );
  }
  public void amethod( ) {
    int k=10;
    switch(k) {
       default: //Put the default at the bottom, not here
             System.out.println("This is the default output");
             break;
       case 10:
             System.out.print("ten ");
       case 20:
             System.out.println("twenty");
             break;
    }
  }
}
```

A) Compile and run with output "ten "
B) Compile and run with output "ten twenty"
C) Compile and run with output "This is the default output"
D) Compile and run with output "twenty"

Question 1n

Given the following code

```
public class Q1n extends Base {
  static boolean b1=false;
  static int i = -1;
  static double d = 10.1;
  public static void main(String argv[ ]) {
     Q1n m = new Q1n( );
     Base b = new Base( );
     //Here
  }
}
class Base{ }
```

Which of the following, if inserted at the comment //Here will allow the code to compile and run without error

A) b=m;
B) m=b;
C) i=d;
D) b1 =i;

Question 1o

Given the following class definition which of the following can be legally placed after the comment line //Here ?

```
public class Q1o extends Base {
    public static void main(String arg[ ]) {
        Q1o m = new Q1o(10);
    }
    Q1o(int i) {
        super(i);
    }
    Q1o(String s, int i) {
        this(i);
        //Here
    }
}
class Base {
    public Base(int i) { }
}
```

A) Q1o m = new Q1o( );
B) super( );
C) this("Hello",10);
D) Base b = new Base(10);

Question 1p

Given the following class definition, which of the following statements would be legal after the comment //Here

```
class Q1p {
    String s= new String("Between");
    public void amethod(final int iArgs) {
        int iam;
        class Bicycle {
            public void sayHello( ) {
                int iOther;
            } //End of bicycle class
        }
    } //End of amethod
    public void another( ) {
        //Here
    }
}
```

A) Bicycle b = new Bicycle( );
B) System.out.println(s);
C) System.out.println(iOther);no
D) System.out.println(iam); no

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Also sign the last page. You
the pages during first fifty minutes. A
invigilator.

Write a class Triangle with three instance double variables namely sideA, sideB an sideC.

The class must also have following methods.

- A default constructor which produces a triangle with all sides being equal to 1.0
- A one parameter constructor which accepts a double and creates an equilater triangle with all sides being equal to passed parameter.
- A two parameter constructor which accepts two doubles x and y and creates a isosceles triangle with sides x, x and y.
- A three parameter constructor which accepts three doubles x, y and z and creat a triangle whose sides are respectively equal to x, y and z
- A constructor which accepts a reference to an existing triangle and creates corresponding clone. It also returns the reference of the cloned triangle.
- A class method objectCount( ) which returns the current count of how man objects of type triangle have been created.
- An instance method perimeter( ) which calculates and returns the perimeter c the triangle.
- An instance method isRightAngled( ) which returns true if this triangle is a righ angled one and returns false otherwise.
- An instance method toString( ), which returns a suitable String representation o current object.