Group A

1. A do-while loop is executed:

At least once
At least twice
At most once

Ans= At least once

2. What can be done using one type of loop can also be done using the other two types of loops, True or False? Justify your answer.

Ans= The given statement is true. To justify this we use following code:

```
public class loop
{
    public static void main(String[]args){
        int i=1,n=5;
        while (i<=n){
            System.out.println(i);
            i++;

        }
    }
}
```

```
1
2
3
4
5
```

```
public class loop1
{
    public static void main(String[]args){
        for(int i=1;i<=5;i++){
            System.out.println(i);
        }
        }
    }
```

```
1
2
3
4
5
```

Hence,we can justify that we can use different types of loops for the same condition.

3. Write an equivalent while() loop for the following for() loop

```
int s=0;
for(int x=1; x<=25;
x+=2)
```

```
s+=x;
```

```
public class whileloop
{
    public static void main (String[]args){
        int x=1,n=25,s=0;
        while(x<=n){
            System.out.println(x);
            x=x+2;
            s=s+x;
        }
        }
    }
```

```
1
3
5
7
9
11
13
15
17
19
21
23
25
```

Group B

1. Write a program to print numbers from 1 to 10.

```java
public class oneTo10
{
public static void main(String[] args){
int i=1;
while(i<=10){
System.out.println(i);
i++;
}
}
}
```

```
1
2
3
4
5
6
7
8
9
10
```

2. Write a program to calculate the sum of first 10 natural number.

```java
public class sumOf10Naturals
{
public static void main(String[] args){
int sum=0;
int i=1;
while(i<=10){
sum+=i;
i++;
}System.out.println("Sum is:"+sum);
}
}
```

```
Options
Sum is:55
```

3. Write a program that prompts the user to input a positive integer. It should then print the multiplication table of that number.

```java
import java.util.Scanner;
public class multiplyOfIntegerNum
{
public static void main(String[] args){
Scanner sc=new Scanner(System.in);
System.out.print("Enter a positive integer:");
int a=sc.nextInt();
int i=1;
int multiply;
while(i<=10){
multiply=i*a;
System.out.println(multiply);
i++;
}

}
}
```

```
Enter a positive integer:6
6
12
18
24
30
36
42
48
54
60
```

4. Write a program to find the factorial value of any number entered through the keyboard.

```
import java.util.Scanner;
public class Factorial
{
public static void main(String[] args){
int fac=1;
int i=1;
Scanner sc=new Scanner(System.in);
System.out.print("Enter a number:");
int a=sc.nextInt();
while(i<=a){
fac*=i;
i++;
}System.out.println(fac);
}
}
```

```
Enter a number:7
5040
```

5. Two numbers are entered through the keyboard. Write a program to find the value of one number raised to the power of another. (Do not use Java built-in method) [Home Task]

```java
import java.util.Scanner;
public class NumberPowerToAnyother
{
public static void main(String[] args){
int result=1;
Scanner sc=new Scanner(System.in);
System.out.println("Enter two numbers:");
int a=sc.nextInt();
int b=sc.nextInt();
while(b!=0){
result*=a;
b--;
}System.out.println("The power of" +a+" is"+result);
}
}
```

```
Enter two numbers:
4
3
The power of4 is64
```

6. Write a program to enter the numbers till the user wants and at the end it should display the count of positive, negative and zeros entered.

```java
import java.util.Scanner;
public class positiveNegativeZero
{
public static void main(String[] args){
int countP=0;
int countN=0;
int countZ=0;
Scanner sc=new Scanner(System.in);
char choice;
System.out.print("Enter y to continue and n to terminate:");
choice=sc.next().charAt(0);
while(choice!='n'){
System.out.print("Enter a number");
int a=sc.nextInt();
if(a<0){
countP++;
}else if(a==0){
countN++;
} else{
countZ++;
}
System.out.print("Enter y to continue and n to terminate:");
choice=sc.next().charAt(0);}

System.out.println("zero:"+countN);
System.out.println("Positive:"+countZ);
System.out.println("Negative:"+countP);
}
}
```

```
Enter y to continue and n to terminate:y
Enter a number5
Enter y to continue and n to terminate:n
zero:0
Positive:1
Negative:0
```

7. Write a program to print Fibonacci series of n terms where n is input by user:

0 1 1 2 3 5 8 13 24 .....

```java
import java.util.Scanner;
public class Fibonacci
{
public static void main(String[] args){
Scanner sc=new Scanner(System.in);
int count=sc.nextInt();
int n1=0;
int n2=1;
int n3;
int i;
System.out.print(+n1+""+n2);
for(i=2;i<count;i++){
n3=n1+n2;
System.out.print(""+n3);
n1=n2;
n2=n3;
}
}
}
```

Options

```
5
011238
011235813
```

8. Write a program to print following:

*

i)

***

*****

****

****

```
public class Triangle
{
public static void main(String[] args){
for(int i=1;i<=5;i++){
for(int j=1;j<=(2*i)-1;j++){
System.out.print("*");
}System.out.println();
}
}
}
```

Options

```
*
***
*****
*******
*********
```

ii) 1

222

33333

4444444

555555555

```
public class triangle2
{
public static void main(String[] args){
for(int i=1;i<=5;i++){
for(int j=1;j<=(2*i)-1;j++){
System.out.print(i);
}System.out.println();
}
}
}
```

Options

```
1
222
33333
4444444
555555555
```

iii) 1

212

32123

4321234

543212345

[HomeTask]

```java
import java.util.*;
public class triangle3 {
public static void main(String[] args) {
System.out.print("\u000C");
int m=0;
for(int i=1;i<=5;i++,m=2){
for(int j=1;j<=5-i;j++){
System.out.print(" ");
}
for(int k=i;k>=1;k--){
System.out.print(k);
}
for(int l=i;l>=2;l--){
System.out.print(m);
++m;
}
System.out.println();
}
}
}
```

Options

```
    1
   212
  32123
 4321234
543212345
```

Group C

1. Write a program that:

(a) Uses a loop to add up all the even numbers between 100 and 200, inclusive.

```
import java.util.*;
public class SeriesInfinite {
        public static void main(String[] args) {
        System.out.print("\u000C");
        int b=100;
        first:
                for(int i=100;i<=200;i+=2){
                        Scanner YN = new Scanner(System.in);
                        System.out.println("Enter 1 to add "+b+" with "+ (i+=2)+" or enter any other number to discontinue");
                        int a = YN.nextInt();
                        if(a==1){
                                b=b+i;
                                continue;
                        }
                        break;
                }
        System.out.println("The sum of the numbers is "+b+".");
        }
}
```

Options

```
Enter 1 to add 100 with 102 or enter any other number to discontinue
1
Enter 1 to add 202 with 106 or enter any other number to discontinue
1
Enter 1 to add 308 with 110 or enter any other number to discontinue
6
The sum of the numbers is 308.
```

(b) Sums a series of (positive) integers entered by the user, excluding all numbers that are Greater than 100.

```java
import java.util.Scanner;
public class PositiveIntegerFromUser
{
public static void main(String[] args){
Scanner sc=new Scanner(System.in);
int sum=0;
int i=0;
System.out.print("Enter a number");
int a=sc.nextInt();
sum=sum+a;
while(a<100 && a>0){
System.out.print("Enter a number");
a=sc.nextInt();
if(a<100 && a>0){
sum=sum+a;
}
}System.out.print("Sum is"+sum);

}

}
```

```
5
The sum of the numbers
Enter a number5
Enter a number6
Enter a number7
Enter a number7
Enter a number105
Sum is25
```

(c) Solves (a) but this time using an infinite loop, break and continue statements.

```
    import java.util.*;
public class infiniteloop {
public static void main(String[] args) {
System.out.print("\u000C");
int b=100;
first:
for(int i=100;i<=200;i+=2){
Scanner YN = new Scanner(System.in);
System.out.println("Enter 1 to add "+b+" with "+ (i+=2)+" or enter any other number to discontinue");
int a = YN.nextInt();
if(a==1){
b=b+i;
continue;
}
break;
}
System.out.println("The sum of the numbers is "+b+".");
}
}
```

Options

```
Enter 1 to add 100 with 102 or enter any other number to discontinue
1
Enter 1 to add 202 with 106 or enter any other number to discontinue
5
The sum of the numbers is 202.
```

3. For each of the following, indicate which a definite loop is, and which an indefinite loop, Explain your reasoning.

(a)

```
public class Main {
public static void main(String[] args) {
int num;
String a = System.console().readLine("Enter a non-zero
value:"); num = Integer.parseInt(a);
while (num == 0) {
a = System.console().readLine("Enter a non-zero value:");
num = Integer.parseInt(a);
}
}
}
```

=This is an indefinite loop because the loop will continue until 0 is given by the user.

(b)

```
public class Main {
public static void main(String[] args) {
int n = 0;
while (n < 10){
System.out.printf("%f\n", Math.pow(2,
n));
n = n + 1;
 }
 }
 }
```

=This is a definite loop because it will stop when the value of one gets to ten.

Group D

1. Write a program to compute the cosine of x. The user should supply x and a positive integer n. We compute the cosine of x using the series and the computation should use all terms in the series up through the term involving x^n cos x = 1 - x^2/2! + x^4/4! - x^6/6! ..... [HomeTask]s

```java
import java.lang.Math.*;

class cos
{
    static final double PI = 3.142;

    static double cosXSeriesSum(double x,
                                int n)
    {
        // here x is in degree.
        // we have to convert it to radian
        // for using it with series formula,
        // as in series expansion angle is in radian

        x = x * (PI / 180.0);

        double res = 1;
        double sign = 1, fact = 1,
                         pow = 1;
        for (int i = 1; i < 5; i++)
        {
            sign = sign * -1;
            fact = fact * (2 * i - 1) *
                                (2 * i);
            pow = pow * x * x;
            res = res + sign * pow / fact;
        }
```

```
            res = res + sign * pow / fact;
        }

        return res;
    }

    // Driver Code
    public static void main(String[] args)
    {
        float x = 50;
        int n = 5;
        System.out.println((float)(
            cosXSeriesSum(x, 5) * 1000000) /
                                  1000000.00);
    }
}
```

Options

```
0.642701
```