Part A

1. **Program to assign two integer values to X and Y. Using the 'if' statement the output of the program should display a message whether X is greater than Y.**

```java
import java.util.Scanner;
public class GreaterNumber{
    public static void main(String args[]){
        Scanner sc = new Scanner(System.in);
        int x, y;
        System.out.println("Enter two numbers: ");
        x = sc.nextInt();
        y = sc.nextInt();
        if(x > y)
            System.out.println(x + " is greater than " + y);
        else
            System.out.println(x + " is lesser than " + y);
    }
}
```

Output -
Enter two numbers: 3 2
3 is greater than 2

2. **Program to list the factorial of the numbers 1 to 10. To calculate the factorial value, use while loop. (Hint Fact of 4 = 4*3*2*1)**

```java
public class Factorial{
    public static void main(String args[]){
        int i, n, fact;
        for(i = 1; i <=10; i++)
        {
            fact = 1;
            n = i;
            while(n > 1)
            {
                fact *= n;
                n--;
            }
            System.out.println("Factorial of " + i + " = " + fact);
        }
    }
}
```

Output -
Factorial of 1 = 1
Factorial of 2 = 2
Factorial of 3 = 6
Factorial of 4 = 24
Factorial of 5 = 120
Factorial of 6 = 720
Factorial of 7 = 5040
Factorial of 8 = 40320
Factorial of 9 = 362880
Factorial of 10 = 3628800

3. **Program to add two integers and two float numbers. When no arguments are supplied, give a default value to calculate the sum. Use function overloading.**

```java
public class Add{
    void sum(int x, int y)
    {
        int s = x + y;
        System.out.println("Sum = " + s);
    }
    void sum(float x, float y)
    {
        float s = x + y;
        System.out.println("Sum = " + s);
    }
    void sum()
    {
        int x = 5;
        int y = 10;
        int s = x + y;
        System.out.println("Sum = " + s);
    }
    public static void main(String args[])
    {
        Add a = new Add();
        a.sum(1, 2);
        a.sum(1.1f, 2.2f);
        a.sum();
    }
}
```

Output -
Sum = 3
Sum = 3.3000002
Sum = 15

4.Program to perform mathematical operations. Create a class called AddSub with methods to add and substract. Create another class called MulDiv that extends from AddSub class to use the member data of the Superclass. MulDiv should have methods to multiply and divide .A main function should access the methods and perform the mathematical operations.(File name: MulDiv.java)

```java
class AddSub    //Superclass
{
    int z;
            public void add(int x,int y)  // Addition method

        {
            z = x+y;
            System.out.println("The sum of the given numbers:"+z);
        }
        public void sub(int x,int y)   // Substraction method
        {

            z = x-y;
            System.out.println("The difference of the given numbers:"+z);

        }

}


        public class MulDiv extends AddSub // Muldiv subclass--Inheritance

    {

        public void multiply(int x,int y)// Multiplication method

        {
            z= x*y;

            System.out.println("The product  of the given numbers:"+z);

        }

        public void divide(int x,int y)// Division Method

        {
            z= x/y;
            System.out.println("The quotient for the given numbers:"+z);

        }
```

```java
    public static void main(String args[])
 {
        int a = 20,b=10;
    MulDiv md  = new MulDiv();
    md.add(a,b);
    md.sub(a,b);
    md.multiply(a,b);
    md.divide(a,b);
    }
    }
```

Output:

```
C:\JAVALAB>javac MulDiv.java

C:\JAVALAB>java MulDiv
The sum of the given numbers:30
The difference of the given numbers:10
The product  of the given numbers:200
The quotient for the given numbers:2
```

5. Program with class variable that is available for all instances of a class. Use static variable declaration. Observe the changes that occur in the object's member variable values.

```java
class Student{
      int roll;
      String name;
      static String college;

      Student(int r, String n, String c){
            roll = r;
            name = n;
            college = c;
      }
      void display()
      {
            System.out.println(roll + " " + name + " " + college);
      }
 }
class StaticExample{
      public static void main(String args[]){
            Student s1 = new Student(1, "s1", "sample1");
            s1.display();
            Student s2 = new Student(2, "s2", "sample2");
```

```
                s2.display();
                s1.display();
        }
}
```

Output-
1 s1 sample1
2 s2 sample2
1 s1 sample2

6. Program

    a) **To find the area and circumference of the circle by accepting the radius from the user.**

```java
import java.util.Scanner;
class A06aCircle{
    public static void main(String args[]){
            Scanner sc = new Scanner(System.in);
            System.out.print("Enter the radius: ");
            float r = sc.nextFloat();
            float a = 3.14f * r * r;
            float c = 2 * 3.14f * r;
            System.out.println("Area = " + a);
            System.out.println("Circumference = " + c);
    }
}
```

Output-
Enter the radius: 3
Area = 28.26
Circumference = 18.84

b) To accept a number and find whether the number is Prime or not.

```java
import java.util.Scanner;
class A06bPrime{
    public static void main(String[] args){
        Scanner sc = new Scanner(System.in);
        int i, c = 0;
        System.out.print("Enter the number: ");
        int n = sc.nextInt();
        if(n <= 1)
            System.out.println("It is not a prime number");
        else
        {
            for ( i = 2; i < n; i++)
            {
                if (n % i == 0)
                    c++;
            }
            if (c == 0)
            System.out.println("It is a prime number.");
            else
                System.out.println("It is not a prime
number.");
        }
    }
}
```

Output -
Enter the number: 3
It is a prime number.

Enter the number : 2
It is not a prime number.

7. Program to create a student class with following attributes; Enrollment No: Name, Mark of sub1, Mark of sub2, mark of sub3, Total Marks. Total of the three marks must be calculated only when the student passes in all three subjects. The pass mark for each subject is 50. If a candidate fails in any one of the subjects his total mark must be declared as zero. Using this condition, write a constructor for this class. Write separate functions for accepting and displaying student details. In the main method create an array of three student objects and display the details.

```java
import java.util.Scanner;
public class A07Constructor{
        public static void main(String args[]){
                StudentInfo stu[] = new StudentInfo[3];
                for(int i = 0; i < 3; i++)
                        stu[i] = new StudentInfo();
                System.out.println("\t\tStudent Details");
                System.out.println("Enrollment no.\t\tName\t\
tTotal");
                for(int i = 0; i < 3; i++)
                        stu[i].displayInfo();
        }
}
class StudentInfo{
        Scanner sc = new Scanner(System.in);
        String eid;
        String name;
        int s1, s2, s3, total;
        StudentInfo(){
                readStudentInfo();
        }
        public void readStudentInfo(){
            System.out.println("Enter student details");
            System.out.println("Enrollment no: ");
            eid = sc.next();
            System.out.println("Name: ");
            name = sc.next();
            System.out.println("Enter marks of 3 subjects: ");
            s1 = sc.nextInt();
            s2 = sc.nextInt();
            s3 = sc.nextInt();
            if(s1 >= 50 && s2 >= 50 && s3 >= 50)
                    total = s1 + s2 + s3;
            else
```

```
                total = 0;
        }

        public void displayInfo(){
                System.out.println(eid + "\t\t\t" + name + "\t\t\t"
+ total);
        }
}
```

Output -
Enter student details
 Enrollment no: 1
Name: Geetha
Enter marks of 3 subjects: 99 99 99
Enter student details
Enrollment no: 2
Name: Mohan
Enter marks of 3 subjects: 1 1 1
Enter student details
Enrollment no: 3
Name: Chaitra
Enter marks of 3 subjects: 12 5 1
                Student Details

Enrollment no.	Name	Total
1	Geeta	297
2	Mohan	0
3	Chaitra	0