Q1) WAP in java which will accept the mark of a student from the keyboard. If the marks is less then 0 or greater than 100, than the program will throw an user defined exception and display the necessary message, otherwise the accepted marks will be displayed.   (3 marks)

```java
package ExceptionHandling;
import java.util.Scanner;
import java.util.InputMismatchException;
// create student class.
class StudentManagement extends Exception
{
    StudentManagement(String error)
    {
        super(error);
    }
}
public class MyException
{
    public static void main(String arg[])
    {
        try
        {
            // create object of scanner class.
            Scanner KB=new Scanner(System.in);
            // enter marks between 1-100.
            System.out.print("Enter marks here : ");
            int h=KB.nextInt();
            // condition for checking valid entry of marks.
            if(!(h>=0 && h<=100))
            {
                throw(new StudentManagement("Invalid marks:"+h));
            }
            System.out.print("Entered marks are : " + h
        }
        catch(InputMismatchException e)
        {
            System.out.println("Invalid Input..Pls Input Integer Only..");
        }
        catch(StudentManagement e)
        {
            System.out.println("Error:"+e);
        }
    }
}
```

Q2) Define an interface *"NumOperations"* with methods to check whether an integer number is even, odd or prime. Define a class *TestNumber* having one private int data member. Write a default constructor to initialize it to 0 and another constructor to initialize it to a given value. Implement the above interface. Create an object in main() and test all operations. (4 marks)

```java
import java.util.Scanner;

interface NumOperations {
    boolean isEven(int number);

    boolean isOdd(int number);

    boolean isPrime(int number);
}

class TestNumber {
    private int number;

    public TestNumber() {
        this.number = 0;
    }

    public TestNumber(int number) {
        this.number = number;
    }

    public boolean isEven(int number) {
        if (number % 2 == 0) {
            return true;
        }
        return false;
    }

    public boolean isOdd(int number) {
        if (number % 2 != 0) {
            return true;
        }
        return false;
    }

    public boolean isPrime(int number) {
        for (int i = 2; i < number; i++) {
```

```java
            if (number % i == 0) {
                return false;
            }
        }
        return true;
    }
}

class Demo {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter a number: ");
        int number = sc.nextInt();
        TestNumber tn = new TestNumber(number);
        System.out.println("Is " + number + " even? " +
tn.isEven(number));
        System.out.println("Is " + number + " odd? " +
tn.isOdd(number));
        System.out.println("Is " + number + " prime? " +
tn.isPrime(number));

    }
}
```

Q3) Implement a package SUMMATION having a class Number. The class has a data member value. Include appropriate constructors and a method is_Even() which returns true if value is even otherwise false. Write an application class Demo where the above package is imported. Demo class is used to calculate the square for the even and cube for the odd number.

```java
package SUMMATION;

public class Number {

    private int number;


    public Number() {

        this.number = 0;

    }


    public Number(int number) {

        this.number = number;

    }


    public boolean is_Even(int number) {

        if (number % 2 == 0) {

            return true;

        }

        return false;

    }
}


import java.util.Scanner;

import SUMMATION.Number;
```

```java
public class Demo {

    public static void main(String[] args) {

        Scanner sc = new Scanner(System.in);

        System.out.println("Enter the number");

        int number = sc.nextInt();

        Number num = new Number(number);

        if (num.is_Even(number)) {

            System.out.println("Square of the number is " +
number * number);

        } else {

            System.out.println("Cube of the number is " +
number * number * number);

        }

    }

}
```