Exception Handling

Q1. Electricity Bill Calculation with Exception Handling Design a Java program to calculate the electricity bill for a customer, including exception handling for invalid input values. Implement a class named ElectricityBill with the following specifications:

Code:-

```
import java.lang.*;
import java.util.*;
class ElectricityBill{
        String customerName;
        double unitsConsumed;
        double billAmount;


                void calculateBillAmount() {
    if (unitsConsumed <= 100) {
        billAmount = unitsConsumed * 5; // Rs. 5 per unit for first 100 units
    } else if (unitsConsumed <= 300) {
        billAmount = 100 * 5 + (unitsConsumed - 100) * 7; // Rs. 7 per unit for 101 to 300 units
    } else {
        billAmount = 100 * 5 + 200 * 7 + (unitsConsumed - 300) * 10; // Rs. 10 per unit above 300
units
    }

        }


        public  ElectricityBill(String customerName, double unitsConsumed ){


        if (unitsConsumed < 0) {
```

```
            throw new IllegalArgumentException("Units consumed cannot be negative.");
        }

            this.customerName=customerName;
this.unitsConsumed=unitsConsumed;
        calculateBillAmount(); // Automatically calculate bill after object creation
}


            void printBill(){
                    System.out.println("enter customer name : " +customerName);
                                    System.out.println("enter unitsConsumed : "+unitsConsumed);
                                                                    System.out.println("Bill amount is:
"+billAmount);

            }

            public static void main(String[] args){
                    Scanner sc= new Scanner(System.in);
                    try{
                    System.out.println("enter customer name : ");
                    String customerName=sc.nextLine();
                    System.out.println("enter unitsConsumed : ");
                    double unitsConsumed=sc.nextDouble();


              // Create ElectricityBill object
            ElectricityBill bill = new ElectricityBill(customerName, unitsConsumed);

            // Print the bill details
            bill.printBill();

        } catch (InputMismatchException e) {
```

```
            System.out.println("Error: Invalid input! Please enter a numeric value for units consumed.");
        } catch (IllegalArgumentException e) {
            System.out.println("Error: " + e.getMessage());
        } finally {
            sc.close(); // Close the scanner resource
        }
    }
}
```

Output:-

enter customer name :

sakshi

enter unitsConsumed :

54

enter customer name : sakshi

enter unitsConsumed : 54.0

Bill amount is: 270.0

Q2. Student Marks and Grade Calculation with Exception Handling

Codes:-

```
import java.util.*;
class Student{
            String name;
    int rollNo;
  double marks[]=new double[5];
  double average;
  char grade;
  //constructor
  public Student(String name,int rollNo,double marks[]){
```

```
                    for (double mark : marks) {
        if (mark < 0 || mark > 100) {
            throw new IllegalArgumentException("Mark should be between 0 and 100.");
        }
    }
        this.name=name;
        this.rollNo=rollNo;
        this.marks=marks;

}

public void calculateAverage(){
        double sum=0;



        for(int i=0;i<5;i++){
                sum+=marks[i];
        }
       average=sum / 5;
}



public void calculateGrade() {
    if (average >= 90) {
        grade = 'A';
    } else if (average >= 80) {
        grade = 'B';
    } else if (average >= 70) {
        grade = 'C';
    } else if (average >= 60) {
        grade = 'D';
    } else {
```

```
        grade = 'F';
    }
 }
public void displayStudentInfo(){
            System.out.println("Enter student name : "+name);
                    System.out.println("Enter student roll No : "+rollNo);


           System.out.print("Marks: ");
    for (double mark : marks) {
        System.out.print(mark + " ");
    }
    System.out.println();
            System.out.println(" average of marks : "+average);
                    System.out.println("Grade: "+grade);
}
public static void main(String[] args) {
    Scanner sc = new Scanner(System.in);

    try {
        //  user for student details
        System.out.print("Enter student's name: ");
        String name = sc.nextLine();

        System.out.print("Enter roll number: ");
        int rollNo = sc.nextInt();

        // Get marks for 5 subjects
        double[] marks = new double[5];
        System.out.println("Enter marks for 5 subjects (between 0 and 100):");
        for (int i = 0; i < 5; i++) {
            System.out.print("Mark for subject " + (i + 1) + ": ");
            marks[i] = sc.nextDouble();
```

```
            }

            // Create a Student object
            Student student = new Student(name, rollNo, marks);

            // Calculate average and grade
            student.calculateAverage();
            student.calculateGrade();

            // Display student information
            student.displayStudentInfo();

        } catch (InputMismatchException e) {
            System.out.println("Error: Invalid input! Please enter a numeric value.");
        } catch (IllegalArgumentException e) {
            System.out.println("Error: " + e.getMessage());
        } finally {
            sc.close(); // Close the scanner resource
        }
    }
}
```

Output:-

Enter student's name: sarika

Enter roll number: 120

Enter marks for 5 subjects (between 0 and 100):

Mark for subject 1: 45

Mark for subject 2: 75

Mark for subject 3: 76

Mark for subject 4: 44

Mark for subject 5: 88

Enter student name : sarika

Enter student roll No : 120

Marks: 45.0 75.0 76.0 44.0 88.0

average of marks : 65.6

Grade: D