Institute of Computer Technology

B. Tech. Computer Science and Engineering

Semester: III

Sub: Object-Oriented Programming

Course Code: 2CSE303

Practical Number:3

Objective:

To learn about condition (if, if-else, nested if-else, else-if ladder, switch case), class, object and constructor concept in java.

Q.1.Problem Definition:

Make a program to obtain length (L) and breadth (B) of a rectangle and check whether its area is greater, or perimeter is greater, or both are equal.

Code :

```java
import java.util.Scanner;

public class Rectangle {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);

        // Input the length and breadth
        int length = sc.nextInt();
        int breadth = sc.nextInt();

        // Calculate area and perimeter
        int area = length * breadth;
        int perimeter = 2 * (length + breadth);

        // Compare area and perimeter
        if (area > perimeter) {
            System.out.println("Area");
            System.out.println(area);
        } else if (perimeter > area) {
            System.out.println("Peri");
```

```
        System.out.println(perimeter);

    } else {

        System.out.println("Equal");

        System.out.println(area);

    }


    sc.close();

  }
}
```

Output :

7

2

Peri

18

Q.2. Problem definition:

Pooja would like to withdraw Rs. X from an ATM. The cash machine will only accept the transaction if X is a multiple of 5, and Pooja's account balance has enough cash to perform the withdrawal transaction (including bank charges). For each successful withdrawal the bank charges Rs. 5. Calculate Pooja's account balance after an attempted transaction.

Code :

```java
import java.util.Scanner;


public class ATMWithdrawal {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);


        System.out.print("Enter the withdrawal amount: ");
        int X = scanner.nextInt();
```

```java
        System.out.print("Enter your initial account balance: ");

        double Y = scanner.nextDouble();


        double remainingBalance = calculateBalance(X, Y);

        System.out.printf("Your remaining balance is: %.2f\n", remainingBalance);


        scanner.close();

    }


    public static double calculateBalance(int X, double Y) {

        if (X % 5 != 0) {

            return Y; // Invalid withdrawal amount

        }


        double requiredBalance = X + 5;

        if (Y < requiredBalance) {

            return Y; // Insufficient funds

        }


        return Y - requiredBalance;

    }

}
```

Output :

Enter the withdrawal amount: 2000

Enter your initial account balance: 5000

Your remaining balance is: 2995.00

Q.3. Make a program to obtain a number N and increment its value by 1 if the number is divisible by 4,6 and 10 otherwise decrement its value by 1.

Code :

```java
import java.util.Scanner;

public class NumberIncrementDecrement {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        System.out.print("Enter a number: ");
        int N = scanner.nextInt();

        if (N % 4 == 0 && N % 6 == 0 && N % 10 == 0) {
            N++; // Increment by 1
        } else {
            N--; // Decrement by 1
        }

        System.out.println("New value of N: " + N);

        scanner.close();
    }
}
```

Output :

Enter a number: 60

New value of N: 61

Q.4. Compute the real roots of the equation: ax2+bx+c=0.

Code :

```java
import java.util.Scanner;

public class SimpleQuadraticSolver {

    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        // Input coefficients a, b, and c
        System.out.print("Enter a: ");
        double a = scanner.nextDouble();
        System.out.print("Enter b: ");
        double b = scanner.nextDouble();
        System.out.print("Enter c: ");
        double c = scanner.nextDouble();

        // Calculate the discriminant
        double discriminant = b * b - 4 * a * c;

        // Determine the number of roots
        if (a == 0) {
            if (b == 0) {
                System.out.println("No solution.");
            } else {
                System.out.println("One root: " + (-c / b));
            }
        } else if (discriminant < 0) {
            System.out.println("No real roots.");
        } else if (discriminant == 0) {
```

```
        System.out.println("One root: " + (-b / (2 * a)));

    } else {

        double root1 = (-b + Math.sqrt(discriminant)) / (2 * a);

        double root2 = (-b - Math.sqrt(discriminant)) / (2 * a);

        System.out.println("Two roots: " + root1 + " and " + root2);

    }


    scanner.close();

  }

}
```

Output :

Enter a: -1

Enter b: 1

Enter c:

0

Two roots: -0.0 and 1.0

Q.5. Determines a student's grade, for that, you have to write an appropriate program, which will read five subject marks from the user, and then have to find total and average marks of given five subjects. On the basis of the average marks, you have to find grade as per the following condition:

-if the average score =90% =>grade=O

-if the average score >=70% and <90%=> grade=A

-if the average score>=50% and <70% =>grade=B

-if the average score>=40% and <50% =>grade=C

-if the average score<40% =>grade=Fail

Code :

import java.util.Scanner;

```java
public class GradeCalculator {

    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        // Array to store the marks of 5 subjects
        int[] marks = new int[5];
        int total = 0;

        // Input marks for 5 subjects
        System.out.println("Enter the marks for 5 subjects:");
        for (int i = 0; i < 5; i++) {
            System.out.print("Subject " + (i + 1) + ": ");
            marks[i] = scanner.nextInt();
            total += marks[i]; // Calculate total marks
        }

        // Calculate average marks
        double average = total / 5.0;

        // Determine the grade based on the average marks
        String grade;
        if (average >= 90) {
            grade = "O";
        } else if (average >= 70) {
            grade = "A";
        } else if (average >= 50) {
            grade = "B";
        } else if (average >= 40) {
            grade = "C";
        } else {
```

```
        grade = "Fail";

    }


    // Display the total, average, and grade

    System.out.println("Total Marks: " + total);

    System.out.println("Average Marks: " + average);

    System.out.println("Grade: " + grade);


    scanner.close();

  }

}
```

Output :

Enter the marks for 5 subjects:

Subject 1: 90

Subject 2: 92

Subject 3: 89

Subject 4: 87

Subject 5: 96

Total Marks: 454

Average Marks: 90.8

Grade: O