Slip 14

10 Marks:

```java
java
Copy code
import java.util.Scanner;

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

        do {
            System.out.println("1. Calculate the volume of a cylinder");
            System.out.println("2. Find the factorial of a given number");
            System.out.println("3. Check if the number is Armstrong or not");
            System.out.println("4. Exit");
            System.out.print("Enter your choice: ");
            choice = sc.nextInt();

            switch (choice) {
                case 1:
                    calculateVolumeOfCylinder();
                    break;
                case 2:
                    findFactorial();
                    break;
                case 3:
                    checkArmstrong();
                    break;
                case 4:
                    System.out.println("Exiting...");
                    break;
                default:
                    System.out.println("Invalid choice! Please enter
again.");
            }
        } while (choice != 4);
    }

    public static void calculateVolumeOfCylinder() {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter the radius of the cylinder: ");
        double radius = sc.nextDouble();
        System.out.print("Enter the height of the cylinder: ");
        double height = sc.nextDouble();

        double volume = 3.14 * radius * radius * height;
        System.out.println("The volume of the cylinder is: " + volume);
    }

    public static void findFactorial() {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter a number: ");
        int number = sc.nextInt();
```

```java
        long factorial = 1;
        for (int i = 1; i <= number; i++) {
            factorial *= i;
        }
        System.out.println("The factorial of " + number + " is: " +
factorial);
    }

    public static void checkArmstrong() {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter a number: ");
        int number = sc.nextInt();
        int originalNumber = number;
        int result = 0;

        while (number != 0) {
            int remainder = number % 10;
            result += Math.pow(remainder, 3);
            number /= 10;
        }

        if (result == originalNumber) {
            System.out.println(originalNumber + " is an Armstrong number.");
        } else {
            System.out.println(originalNumber + " is not an Armstrong
number.");
        }
    }
}
```

20 Marks:

```java
java
Copy code
interface Operation {
    double PI = 3.142;

    double area();
    double volume();
}

class Cylinder implements Operation {
    double radius, height;

    public Cylinder(double radius, double height) {
        this.radius = radius;
        this.height = height;
    }

    @Override
    public double area() {
        return 2 * PI * radius * (radius + height);
    }

    @Override
```

```java
    public double volume() {
        return PI * radius * radius * height;
    }
}

public class Main {
    public static void main(String[] args) {
        Cylinder cylinder = new Cylinder(5, 10);

        System.out.println("Area of Cylinder: " + cylinder.area());
        System.out.println("Volume of Cylinder: " + cylinder.volume());
    }
}
```