Practice (I) Programming Design (I)

Name: Student ID:

Please upload programs of your answer corresponding to questions below. Your programs are named J1.java, J2.java, …, J6.java and used to generate instances for main class.

Questions (10% for first 6 and 40% for the last one):

(1) Please give a declaration for 5 variables whose data types respectively are integer, character, boolean, double and Student where the last one contains member variables ID (String) and name (String). (10%)

(2) Please write a Java program to read inputs for the previous 5 variables from users' keyboard and design to print out their value.

(3) Based on the programming code

```
int[] numbers = {3, 9, 5, -5};
// for..each loop
for (int number: numbers) System.out.println(number);
```

Please write a Java program to assign values to students defined in (1)

```
Student s1, s3, s4;
Students[][] students = {{s1},{s3, s4}};
// print students' names by for..each loop
for(Student student: students) System.out.println(student.name+" ");
```

(4) Please write a Java program required with (A) studentsRef having address reference to students, print each student name by studentsRef (B) studentsCopied having all student instances copied from students, print each student name by studentsCopied.

(5) Please write a java program to print 2 D array by "Arrays.toString(`numbers`)" where `int[] numbers = {{3, 9},{5, -5}};`

(6) Please write a Java program for a calculator with arithmetic functions addition, subtraction, multiplication, and division. Design this calculator as a class taking two inputs from users, executing arithmetic operations, and reaching the

termination by ‘=’.

(7) Please write a Java program for a calculator with arithmetic functions addition, subtraction, multiplication, and division. Design this calculator as a class taking inputs **as many as users want**, executing arithmetic operations, and reaching the termination by '='. You should take the following method. (50%)

```
static double calculate(double result, double num, char operatorChar) {
    if (operatorChar == '\0') {
        result = num;
    } else {
        switch (operatorChar) {
            case '+', '=':
                result += num; break;
            case '-':
                result -= num; break;
            case '*':
                result *= num; break;
            case '/':
                if (num == 0) {
                    System.out.println("Error: Division by zero");
                    return 0;
                }
                result /= num;
                break;
            default:
                System.out.println("Invalid operator");
        }
    }
        return result;
}
```