

Answer Sheet

Name: _____

Language:

- ☐ Java
- ☐ Python
- ☐ JavaScript

SQL Answers:

Question 1:

-- Task A:

-- Task B:

-- Task C:

Question 2:

-- Task A:

-- Task B:

-- Task C:

Programming Answers:

Question 1:

```
public class ProgrammingSection {  
    // Basic Calculator methods  
  
    // 1. Add two numbers  
    public static double add(double a, double b) {  
        return a + b;  
    }  
  
    // 2. Subtract two numbers
```

```
public static double subtract(double a, double b) {  
    return a - b;  
}
```

// 3. Multiply two numbers

```
public static double multiply(double a, double b) {  
    return a * b;  
}
```

// 4. Divide two numbers (handle division by zero)

```
public static double divide(double a, double b) {  
    if (b == 0) {  
        throw new IllegalArgumentException("Division by zero is not allowed.");  
    }  
    return a / b;  
}
```

```
public static void main(String[] args) {
```

```
    // Test the calculator
```

```
    System.out.println("Addition: 5 + 3 = " + add(5, 3));
```

```
    System.out.println("Subtraction: 5 - 3 = " + subtract(5, 3));
```

```
    System.out.println("Multiplication: 5 * 3 = " + multiply(5, 3));
```

```
    System.out.println("Division: 6 / 2 = " + divide(6, 2));
```

```
    // Test division by zero
```

```
    try {
```

```
        System.out.println("Division: 5 / 0 = " + divide(5, 0));
```

```
    } catch (IllegalArgumentException e) {
```

```
        System.out.println("Error: " + e.getMessage());
```

```
    }
```

```
}
```

```
}
```

Question 2:

```
import java.util.Scanner;

public class ProgrammingSection {
    // Basic Calculator methods

    // 1. Add two numbers
    public static double add(double a, double b) {
        return a + b;
    }

    // 2. Subtract two numbers
    public static double subtract(double a, double b) {
        return a - b;
    }

    // 3. Multiply two numbers
    public static double multiply(double a, double b) {
        return a * b;
    }

    // 4. Divide two numbers (handle division by zero)
    public static double divide(double a, double b) {
        if (b == 0) {
            throw new IllegalArgumentException("Division by zero is not allowed.");
        }
        return a / b;
    }

    // Question 2: Student Grades
    public static void studentGrades() {
        Scanner scanner = new Scanner(System.in);

        System.out.print("Enter first exam score: ");
        double score1 = scanner.nextDouble();

        System.out.print("Enter second exam score: ");
        double score2 = scanner.nextDouble();

        System.out.print("Enter third exam score: ");
```

```

double score3 = scanner.nextDouble();

double average = (score1 + score2 + score3) / 3;

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

char grade;
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';
}

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

scanner.close();
}

public static void main(String[] args) {
    // Test the calculator
    System.out.println("Addition: 5 + 3 = " + add(5, 3));
    System.out.println("Subtraction: 5 - 3 = " + subtract(5, 3));
    System.out.println("Multiplication: 5 * 3 = " + multiply(5, 3));
    System.out.println("Division: 6 / 2 = " + divide(6, 2));

    // Test division by zero
    try {
        System.out.println("Division: 5 / 0 = " + divide(5, 0));
    } catch (IllegalArgumentException e) {
        System.out.println("Error: " + e.getMessage());
    }

    // Run student grades
    System.out.println("\n--- Student Grades ---");
    studentGrades();
}
}

```

Question 3:

```
import java.util.HashMap;
import java.util.Map;

public class ShoppingCart {
    private Map<String, Double> items;

    public ShoppingCart() {
        items = new HashMap<>();
    }

    // 1. Add item with price
    public void addItem(String name, double price) {
        items.put(name, price);
        System.out.println("Added: " + name + " - $" + price);
    }

    // 2. Remove item
    public void removeItem(String name) {
        if (items.containsKey(name)) {
            items.remove(name);
            System.out.println("Removed: " + name);
        } else {
            System.out.println("Item not found: " + name);
        }
    }

    // 3. Calculate total price
    public double getTotal() {
        double total = 0;
        for (double price : items.values()) {
            total += price;
        }
        // 4. Apply 10% discount if total > 100
        if (total > 100) {
            total *= 0.9;
            System.out.println("10% discount applied!");
        }
        return total;
    }

    // Display items
    public void displayItems() {
        if (items.isEmpty()) {
            System.out.println("Cart is empty.");
        }
    }
}
```

```

    } else {
        System.out.println("Items in cart:");
        for (Map.Entry<String, Double> entry : items.entrySet()) {
            System.out.println(entry.getKey() + " - $" + entry.getValue());
        }
    }
}

public static void main(String[] args) {
    ShoppingCart cart = new ShoppingCart();

    // Add items
    cart.addItem("Apple", 2.5);
    cart.addItem("Banana", 1.0);
    cart.addItem("Orange", 3.0);

    cart.displayItems();

    // Calculate total
    double total = cart.getTotal();
    System.out.println("Total: $" + total);

    // Add more to trigger discount
    cart.addItem("Laptop", 120.0);
    cart.displayItems();
    total = cart.getTotal();
    System.out.println("Total after discount: $" + total);

    // Remove item
    cart.removeItem("Banana");
    cart.displayItems();
    total = cart.getTotal();
    System.out.println("Total after removal: $" + total);
}
}

```

Question 4:

import java.util.Random;

```

import java.util.Scanner;

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

        // 1. Computer picks random number 1-10
        int numberToGuess = random.nextInt(10) + 1;
        int attempts = 3;

        System.out.println("Welcome to the Number Guessing Game!");
        System.out.println("I have picked a number between 1 and 10.");
        System.out.println("You have 3 attempts to guess it.");

        boolean won = false;

        // 2. User gets 3 tries
        for (int i = 1; i <= attempts; i++) {
            System.out.print("Attempt " + i + ": Enter your guess: ");
            int guess = scanner.nextInt();

            // 3. Tell if too high or too low
            if (guess == numberToGuess) {
                System.out.println("Congratulations! You guessed it right.");
                won = true;
                break;
            } else if (guess < numberToGuess) {
                System.out.println("Too low!");
            } else {
                System.out.println("Too high!");
            }
        }

        // 4. Show result
        if (!won) {
            System.out.println("Sorry, you lost. The number was " + numberToGuess +
".");
        }

        scanner.close();
    }
}

```