

Show all of your work clearly in the space provided or on the additional page at the end of the exam. **Read each problem carefully.** Note that the exam is double sided.

1. (5 points) Describe the difference between compilation and execution errors. Give an example of each.

2. (5 points) Finish the following code snippet by using the `substring()` and `length()` methods from the `String` class to display the middle two characters in `word`. You may assume `word` is at least two characters long and has an even number of characters.

```
Scanner in = new Scanner(System.in);  
String word = in.next();
```

```
System.out.println(word
```

3. (10 points) Give an example of where typecasting is necessary.

4. (5 points) What does `Integer.parseInt(input);` do?

5. (5 points) Draw the different symbols used in flowcharts and explain what they represent.

6. (10 points) What will be displayed when the following code is run?

```
for(int i=0; i<6; i+=1) {  
    for(int j=i; j<4; j+=1) {  
        System.out.print("*");  
    }  
    System.out.println("*");  
}
```

7. (10 points) Suppose that the variables `a`, `b`, and `c` are `booleans` and that `i` is a `int`. List all the combinations of values that will cause the following expression to evaluate to `false`. For `i`, you can indicate the range of values in the form of something like: `i` must be less than `8`.

For example, will the expression evaluate to `false` if `a`, `b`, and `c` are all `false` and `i` is less than `8`? If so, that would be one of your answers to this problem.

```
((a || b) && (c || c) || i > 0)
```

8. (10 points) Rewrite the following switch statement using `if` and/or `if/else` statements.

```
int i = 0;
double x = 3.0;
boolean b = true;
int number = in.nextInt();
switch number {
    case 3:
        i += 3;
    case 5:
        x -= 13.2;
        break;
    case 7:
    case 1:
        b = false;
        break;
    default:
        x = i;
}
```

9. (20 points) [Console Program] Complete the following program that asks the user to enter a bunch of positive integers followed by a non-positive integer. The program should then display the number of odd values entered by the user. Sample output:

```
Enter a bunch of positive integers followed by a non-positive integer:  
1 2 3 4 5 6 7 8 9 10 11 18 0
```

```
You entered 6 odd integers.
```

```
import java.util.Scanner
```

```
public class Exam {
```

```
    public static void main(String[] args) {  
        System.out.println("Enter a bunch of positive integers followed by a"  
            + " non-positive integer:");
```

```
    }  
}
```

10. (20 points) [GUI Program] Complete the following program that uses pop-up windows to interact with the user. The program should ask the user to enter a sentence. If the user enters a set of characters that does not have any punctuation marks (comma, period, question mark, exclamation point), the program should display “That is not a sentence.” Otherwise, the program should display the number of punctuation marks found in the phrase entered.

Hints: `charAt()`, `showMessageDialog()`, `showInputDialog()`

```
import javax.swing.JOptionPane;  
  
public class Exam9 {  
    public static void main(String [] args) {
```

```
    }  
}
```



Additional space — indentify which problem your work is associated with.