

[**May use one 8.5 × 11 inch sheet of paper for notes.**] 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) Draw what occurs in memory when the following line of code is run:

```
int i;
```

2. (5 points) Draw what occurs in memory when the following line of code is run:

```
int i = 5;
```

3. (5 points) Draw the symbol used to represent a decision in a flowchart.

4. (5 points) What is the difference between = and ==?

5. (10 points) Write the following mathematical expression as a legal Java expression (assume that x, y, and z are `doubles`):

$$z = \frac{2}{3} + \frac{1}{xy}$$

6. (15 points) Rewrite the following `for` loop as a `while` loop that has identical behavior to the code shown.

```
for(int i=0; i<10; i+=2) {  
    i = i - 1;  
    System.out.println(i);  
}
```

7. (15 points) Assume the following declarations:

```
int i;  
double d;  
float f;  
long l;
```

Identify which, if any, of the following statements would compile without error. Use typecasting to rewrite any remaining statements so that they no longer cause a compiler error.

1. `i = d;`
2. `l = f;`
3. `l = i;`
4. `d = i;`
5. `d = f;`

8. (20 points) Complete the program below. See the comments for what the program should do.

```
import javax.swing.JOptionPane;

/**
 * The following program asks the user to enter the price of a hamburger
 * and displays the number of pennies required to purchase the burger.
 *
 * Example program interaction:
 *
 *     Enter the price of a hamburger: $1.29
 *     It would take 129 pennies to purchase that burger.
 *
 * All input/output must be through pop-up dialog windows.
 */
public class Exam {
    public static void main(String [] args) {
```

```
    }
}
```

9. (20 points) Complete the following program. The program must ask the user to enter two strings and displays the two strings in the following form: **shorter + longer + shorter** where **shorter** is the shorter of the two strings. If the strings are the same length then either one can be considered to be **shorter**. Input and output must be through the console.

Sample program run:

```
Please enter a word: Yo
Please enter another word: Bob
Yo Bob Yo
```

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

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

```
    }
}
```



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



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