

Name: \_\_\_\_\_

Exam 1  
CS 5JA  
Spring 2009

Short Answer: \_\_\_\_\_ / 24

Output: \_\_\_\_\_ / 25

Program Design: \_\_\_\_\_ / 35

Coding: \_\_\_\_\_ / 16

Total: \_\_\_\_\_ / 100

**Multiple Choice and Short Answer (3 points each)**

1. Internally, the central processing unit (CPU) consists of two parts: **(a)**
  - a. The control unit and the arithmetic and logic unit (ALU)
  - b. The control unit and main memory
  - c. The arithmetic and logic unit (ALU) and main memory
  - d. The input and output devices
  
2. Which of the following is **not** a primitive data type? **(d)**
  - a. short
  - b. long
  - c. float
  - d. String
  
3. If `chr` is a character variable, which of the following `if` statements is written correctly? **(d)**
  - a. `if (chr = "a")`
  - b. `if (chr == "a")`
  - c. `if (chr = 'a')`
  - d. `if (chr == 'a')`
  
4. What command do you use to compile a class called `ReadIt`? **(c)**
  - a. `java ReadIt.java`
  - b. `javac ReadIt`
  - c. `javac ReadIt.java`
  - d. `java ReadIt`

5. RAM is a volatile type of memory. What is meant by the term **volatile**?

**Answer: from the book "Volatile memory is used only for temporary storage. When the computer is turned off, the contents of RAM are erased."**

6. Converting a `double` to an `int` is what kind of conversion?

**Answer: A narrowing conversion**

7. What is the result of the following expression?

$$10 + 5 * 3 - 20$$

**Answer: 5**

8. What value is assigned to `ch` by the following statements?

```
String city = "New York";  
char ch;  
ch = city.charAt(2);
```

**Answer: The value of `ch` is 'w'.**

Name: \_\_\_\_\_

### Program Output (25 points)

The examples below show only code snippets, not an entire program. For each example, show what is printed out.

#### Output Example 1

```
int x = 13, y = 3, z;  
String a = "alpha";  
String b = "bravo";  
  
z = x/y;  
  
if ( z <= 4)  
{  
    System.out.println(a);  
    z = z+1;  
}  
else  
{  
    System.out.println(b);  
    z = x + y;  
}  
System.out.println("z is \n" + z + ".");
```

**Output is :**

**alpha**  
**z is**  
**5.**

Name: \_\_\_\_\_

### Output Example 2

```
double w = 75.25;
int v = 2;

if (w < 10)
    v *= 20;
else if (w < 100)
    v *= 200;
else
{
    v *= 2000;
System.out.println("w is " + w + ".");
}
System.out.println("v is " + v + ".");
```

**Output is :**

**v is 400.**

Name: \_\_\_\_\_

### Program Design (35 points)

An airline offers a frequent-flyer program that awards points to passengers based on the number of miles they have flown. A passenger is awarded 10 points for each mile in a flight, up to a maximum of 20,000 points per flight. So if a flight is 700 miles, the award is 7,000 points. If a flight is 2,500 miles, the award is 20,000 points.

We want to write a program that asks the passenger how many miles was in his flight. The program then computes the number of points that should be awarded for that flight and displays the number of points as output.

- (1) Give your program design below. Include the variables you will use (names and types) and the pseudocode for your program.
- (2) Draw the flowchart for the decision structure in your program design.  
(Use the back of this page if you need more room.)

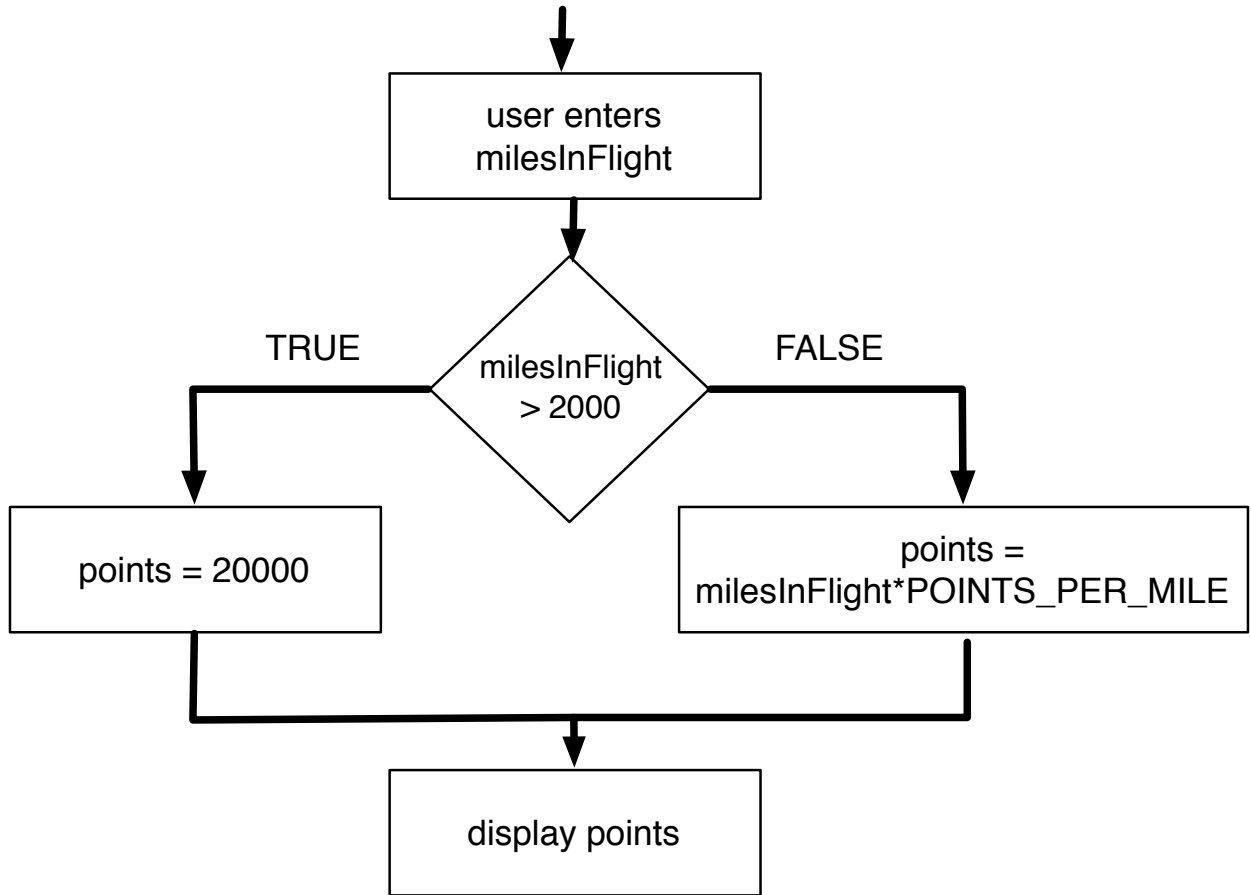
Variables:

```
int milesInFlight; // holds number of miles in user's flight
int points;        // holds number of points user will be awarded
final int POINTS_PER_MILE;
```

Algorithm:

1. Print message to screen "How many miles were in your flight?".
2. User enters number of miles, store in milesInFlight.
3. if (milesInFlight > 2000)
4. {
5. points = 20000;
6. }
7. else
8. {
9. points = milesInFlight\*POINTS\_PER\_MILE;
10. }
11. Print message to screen "Points awarded: " + points

**12. Extra Space for Program Design**



**Coding (16 points)**

Find **3** errors in the program below (there are more than 3). For each error, circle it in the program. Below the program, describe the error and state how to correct the error. Give the correct version of the Java statement where applicable.

```
1 import java.util.Scanner;
2
3 public class WhizBang
4 {
5     public static main(String[] args)
6     {
7         Scanner keyboard = new Scanner(System.out);
8         String name;
9
10        / read the name from the keyboard
11        System.out.print("What is your name? ");
12        name = keyboard.nextDouble();
13
14        if (name.equals("Stacy"))
15            System.out.println("Hi Stacy");
16        else
17            System.out.println("Hello " + Name);
18    }
19
20 }
```

Explain the errors and give corrections here.

1. In line 5, the method header should be `public static void main(String[] args)`
2. In line 7, statement should be `Scanner keyboard = new Scanner(System.in);`
3. In line 10, the comment should start with `//`, not `/`
4. In line 12, the statement should be `name = keyboard.nextLine();`
5. In line 17, the variable `Name` starts with a capital `N`, but the variable is declared with a lowercase `N`. A correct statement is `System.out.println("Hello " + name);`