

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

Exam 2  
CS 5JA  
Spring 2009

Multiple Choice  
and True/False: \_\_\_\_\_ / 30

Truth Table: \_\_\_\_\_ / 10

Output: \_\_\_\_\_ / 20

Program Design: \_\_\_\_\_ / 20

Coding: \_\_\_\_\_ / 20

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

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

**Multiple Choice (3 points each)**

1. This is a `boolean` variable that signals when some condition exists in the program. ANSWER: C

- a. Sentinel
- b. Block
- c. Flag
- d. Case

2. This type of loop will always be executed at least once. ANSWER: B

- a. pre-test loop
- b. post-test loop
- c. sentinel loop
- d. `for` loop

3. If a loop does not contain within itself a way to terminate, it is called ANSWER: D

- a. a `while` loop
- b. a `do-while` loop
- c. a `for` loop
- d. an infinite loop

4. How many times will the following `do-while` loop be executed? ANSWER: B

```
int x = 11;
do
{
    x += 20;
} while (x < 10);
```

- a. 0
- b. 1
- c. 4
- d. 5

5. What is the total number of iterations of the nested loop below. ANSWER: C

```
for (int j = 1; j < X; j++)
{
    for (int k = 1; k < Y; k++)
    {
        System.out.println("I'm inside a loop.");
    }
}
```

- a.  $X \times Y$
- b.  $X + Y$
- c.  $(X - 1) \times (Y - 1)$
- d.  $(X + 1) \times (Y + 1)$

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

6. In the expression `--number`, the `--` operator is in what mode? ANSWER: C

- a. postfix
- b. posttest
- c. prefix
- d. pretest

7. What will be the value of `x` as a result of the following code? ANSWER: C

```
int x = 12, y = 5, z;  
z = y--;  
x += z;
```

- a. `x` is 12
- b. `x` is 16
- c. `x` is 17

8. What will be the value of `w` be as a result of the following code? ANSWER: A

```
int numbers = {2, 1, 4, 3};  
int w = numbers[1]/numbers[2];
```

- a. 0
- b. 1
- c. 2
- d. 0.25

**True or False (2 points each)**

1. (True or False) If `x` and `y` are both `ints`, the following expression correctly determines whether they are equal?

```
(x.equals(y))
```

ANSWER: FALSE

2. (True or False) When an array of primitives of type `int` is declared but not initialized, as in the following statement, the array values are set to `null`.

```
int[] numbers = new int[10];
```

ANSWER: FALSE

3. (True or False) If `a[]` and `b[]` are two integer arrays, the expression `a == b` compares the array contents.

ANSWER: FALSE

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

**Truth Table (10 points)**

Fill in the truth table below. You must show all of your steps to get full credit.

P	Q	$\neg P$	$P \vee Q$	$\neg P \wedge (P \vee Q)$
T	T	F	T	F
T	F	F	T	F
F	T	T	T	T
F	F	T	F	F

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

### Program Output (20 points)

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

#### Output Example 1

```
final double PRICE_OF_ITEM = 10.00;

int numberOfItems = 4;
double discount = 0, total = 0;

switch (numberOfItems)
{
    case 1:
    case 2:
        discount = 0;
        break;
    case 3:
    case 4:
        discount = 1;
        break;
    default:
        discount = 2;
}

total = (PRICE_OF_ITEM*numberOfItems) - discount;

System.out.printf("You have ordered %d items." +
    "\nYour discount is $%.2f.", numberOfItems, discount);

System.out.printf("\nYour total is $%.2f.\n", total);
```

#### Output is :

```
You have ordered 4 items.
Your discount is $1.00.
Your total is $39.00.
```

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

### Output Example 2

```
for (int a = 1; a < 3; a++)
{
    for (int b = 8; b > 6; b--)
    {
        System.out.println("a is " + a);
        System.out.println("b is " + b);
    }
}
```

### Output is :

```
a is 1
b is 8
a is 1
b is 7
a is 2
b is 8
a is 2
b is 7
```

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

### Program Design (20 points)

You are a programmer for a bank, and you are asked to write a program that handles deposits for a single user. Assume that the user starts with a balance of \$100 and that the user will enter 5 deposits. Your program must ask the user for each deposit amount. Your program should then print out the total amount of the the deposits and the new balance. Your program must use a loop.

Show your variable declarations and initializations, and show your pseudocode or Java code for this program. If you write Java code, you will not be penalized for minor code mistakes like missing punctuation. You do not need to worry about input validation – assume the user will only enter valid input.

```
import java.util.Scanner;

public class BankDeposits
{
    public static void main(String[] args)
    {
        Scanner keyboard = new Scanner(System.in);
        double balance = 100;
        double totalDeposit = 0;

        for (int i=1; i<=5; i++)
        {
            System.out.print("Enter deposit " + i + ": ");
            double deposit = keyboard.nextDouble();

            totalDeposit += deposit;
        }

        balance += totalDeposit;

        System.out.printf("Total deposit amount: $%.2f\n",
            totalDeposit);
        System.out.printf("New balance: $%.2f\n", balance);
    }
}
```

**Coding (20 points)**

1. Convert the following for loop to a while loop

```
int j;
for (j=2; j<=100; j*=2)
{
    System.out.println("loop di loo");
}
```

```
int j = 2;
while (j <= 100)
{
    System.out.println("loop di loo");
    j *= 2;
}
```

2. The following code is intended to provide input validation. The user must enter a number that is between 1 and 10 (1 and 10 are both valid entries). The loop should repeat until the user enters a valid number. Fill in the blanks below so that the code performs the correct input validation. You can write your answers in the code or use the lines beneath the code.

```
Scanner keyboard = new Scanner(System.in);
boolean keepLooping = true;
int x = 0;

while(keepLooping)
{
    System.out.print("Please enter a number: ");
    x = keyboard.nextInt();

    if ( x >= 1 && x <= 10 ) // fill in Blank 1
        keepLooping = false; // fill in Blank 2
    else
        System.out.println("Invalid number. Please try again.");
}

System.out.println("Your number is " + x + ".");
```

Blank 1: \_\_\_\_\_

Blank 2: \_\_\_\_\_