# Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Control Structures

**Find the output for the following code segments:**

1. **int** a = 10;

**int** b = 47;

**int** c = 85;

**if**((a < 30) && (c >= 85))

System.out.println("Hello");

**else**

**if** ((b > 50) || (a > 25))

System.out.println("Goodbye");

**else**

System.out.println("I can't make up my mind!");

1. **boolean** one, two, three;

one = true;

two = false;

three = false;

**if** (!one || two)

System.out.println("Snow Boarding is great!");

**else**

**if** (one && !three)

System.out.println("I'd rather ski");

**else**

System.out.println("I prefer water sports");

1. **int** pocket = 5;

**int** bucksNeeded = 20;

**boolean** late = true;

**if** (!late && (pocket < bucksNeeded))

System.out.println("Let's go home");

**else**

System.out.println("Let’s have some fun!");

5. Given the following values for the Boolean variables x, y and z:

x = false

y = true

z = false

Evaluate the following expressions.

\_\_\_\_\_\_ a. x || y && z

\_\_\_\_\_\_ b. (x && !y) || (!x && y)

\_\_\_\_\_\_ c. x && y || z

\_\_\_\_\_\_ d. !(x || y) || z

\_\_\_\_\_\_ e. !y

6. Given these values for the int variables a, b, c, and d:

a = 1 b = 3 c = 4 d = 8

What is the output of the following code?

System.out.println(“Harry”);

if(a < b){

if(c == d)

System.out.println(“is”);

else

System.out.println(“always”);

}

System.out.println(“in”);

if(c >= d)

System.out.println(“double”);

else

System.out.println(“trouble”);

7. Given the int variables x, y and z where x is 5, y is 10 and z is 12, what is the output from each of the following code fragments?

* 1. if( x > 10)

System.out.print( x + y );

System.out.print( x \* 2 );

System.out.println(“ is the answer”);

* 1. if(x != 5)

System.out.println(“x = “ + x);

else

System.out.println( “ y = “ + y);

8.

a. Draw the truth table for the logical AND b. Draw the truth table for the logical OR

c. Draw the truth table for the logical XOR d. Draw the truth table for the logical NOT

9. What value is returned by the call to compute(15,3,7) for the method compute below?

public int compute(int one, int two, int three){

if(one == two + three)

return one - two;

else if(one – three == 8){

if(two > three)

return two;

else

return three;

}

return 0;

}

10. What value is returned by the code segment below?

int month = 8;

switch (month) {

case 1: System.out.println("January"); break;

case 2: System.out.println("February"); break;

case 3: System.out.println("March"); break;

case 4: System.out.println("April"); break;

case 5: System.out.println("May"); break;

case 6: System.out.println("June"); break;

case 7: System.out.println("July"); break;

case 8: System.out.println("August"); break;

case 9: System.out.println("September");

case 10: System.out.println("October");

case 11: System.out.println("November"); break;

case 12: System.out.println("December"); break;

default: System.out.println("Invalid month.");break;

**II. What is the output of the following printf statements? Remember to use b for spaces.**

1. System.out.printf("%f $%f #%d", 8.9, 102.56, 7)

2. System out.printf("%08d %s, 6591, "It is almost Friday!!!")

3. System out.printf("%.8s" "Computer Science Rocks!")

**String s = "Java"; int x = 39; int z = 62 double y = 12.89);**

4. System out.printf("\*%6.1f\*%5d”,y, x");

5. System out.printf("\*%o\*\*%92.1f\*%s\*\*",z,y,s")

1. System.*out*.printf("3$d\*\*%2$f\*\*%1$s", s, y, x);

7. System out.printf("x%x %.2s %4.1f", x, s, y)

8. System out.printf("%o\*\*%x\*\*%e\*\*%f %08d", x, x, y, y, z)

9. System out.printf("\*\*%2$05d %x %d", x, z )

10. System out.printf("\*%-8s\*\*%9s", s, s)

11. System out.printf("%s 105%6d99%d %.5f", s+2014, z, x, 2056.399)

12. System out.printf("%s %2$d %2$#o %d",s, z, 59, 28)

**BONUS QUESTIONS (3 points each)**

1. The island of Elbonia has a rather eccentric postal system. Postage for an item can be anything from 1 dinar to 15 dinari, and you must use exact postage. Frustratingly, there is only space on the envelopes in Elbonia to attach a maximum of three stamps. What is more, they only have three different denominations of stamps, can you work out what they are?
2. On my local railway track there is a tunnel which is 5 miles long. A train, which was 440 yards long, entered the tunnel at a speed of 50 miles per hour. How long did it take for the whole of the train to pass completely through the tunnel? [Note: there are 1760 yards in a mile].

**Answers to printf**

System.*out*.printf("%s %2$d %2$#o %d",s, z, 59, 28);

System.*out*.println();

System.*out*.printf("%.8s", "Computer Science is rocks!");

System.*out*.println();

System.*out*.printf("\*%6.1f\*%5d",y, x);

System.*out*.println();

System.*out*.printf("\*%o\*\*%5.1f\*%s\*\*",z,y,s);

System.*out*.println();

System.*out*.printf("3$d\*\*%2$f\*\*%1$s", s, y, x);

System.*out*.println();

System.*out*.printf("x%x %.2s %4.1f", x, s, y);

System.*out*.println();

System.*out*.printf("%o\*\*%x\*\*%e\*\*%f %08d", x, x, y, y, z);

System.*out*.println();

System.*out*.printf("\*\*%2$05d %x %d", x, z );

System.*out*.println();

System.*out*.printf("\*%-8s\*\*%9s", s, s);

System.*out*.println();

System.*out*.printf("%s 105%6d99%d %.5f", s+2010, z, x, 2056.399);

System.*out*.println();

System.*out*.printf("%s %2$d %2$#o %d",s, z, 59, 28);

}

123456789012345678901234567801234567890

8.900000 $102.560000 #7

00006591 It is almost Friday!!!

Computer

\* 12.9\* 39

\*76\*\* 12.9\*Java\*\*

3$d\*\*12.890000\*\*Java

x27 Ja 12.9

47\*\*27\*\*1.289000e+01\*\*12.890000 00000062

\*\*00062 27 62

\*Java \*\* Java

Java2014 105 629939 2056.39900

Java 62 076 62

**BONUS QUESTIONS: ANSWERS (3 points each)**

1. The island of Elbonia has a rather eccentric postal system. Postage for an item can be anything from 1 dinar to 15 dinari, and you must use exact postage. Frustratingly, there is only space on the envelopes in Elbonia to attach a maximum of three stamps. What is more, they only have three different denominations of stamps, can you work out what they are?

1 4 5

1. On my local railway track there is a tunnel which is 5 miles long. A train, which was 440 yards long, entered the tunnel at a speed of 50 miles per hour. How long did it take for the whole of the train to pass completely through the tunnel? [Note: there are 1760 yards in a mile].

The length of the train is 440 yards = 1320 feet = .25 miles + the length of the tunnel 5 miles / 50 miles per hour = .105 x 60 minutes = 6.3 minutes 30% of 1 minute = 18 seconds so the answer is 6 minutes and 18 seconds.

6 minutes and 18 seconds is correct

The train has to effectively travel 5.25 miles at 50 mph. Time = Dist ÷ Speed = 5.25 ÷ 50 = 0.105 hours = 6.3 minutes = 6 minutes 18 seconds.