

1. Write an expression that stores random integers from -3 to 3 inclusive into an int variable.

```
int x = (int)(Math.random() * 7) - 3;
```

2. When would short circuit evaluation occur for this statement?

```
if (x < y || z > 8)
```

if x is less than y Java does not check z because this is an or and it only needs one part to be true.

3. When would short circuit evaluation occur for this statement?

```
if (x < y && z > 8)
```

if x is not less than y then Java does not check z because an and requires both parts to be true.

4. What is output?

```
int x = 1;
if (x == 3)
    System.out.println("C");
    System.out.println("A");
System.out.println("T");
```

A
T

5. What is output?

```
System.out.println(Math.pow(5, 2));
```

25.0

6. Simplify:

```
!(x == 9 || x < y)
```

$x \neq 9 \ \&\& \ x > y$

7. What is output?

```
System.out.println(13%5);
```

3

8. Complete this truth table:

A	B	!A	!A B
T	T	F	T
T	F	F	F
F	T	T	T
F	F	T	T

9. Assume properly initialized variables. Circle the option that best describes the result:

```
(x > y) || !(x > y && y == 7)
```

$x > y \ || \ (x <= y \ || \ y != 7)$

Always false.

False when x is greater than y.

Always true.

False when y == 7.

10. Finish this code below to print "cold" if temp is less than 68, "just right" if temp is from 68 to 75 inclusive, and "hot" if temp is greater than 75.

```
int temp = /* initialized with valid data */;
```

```
if (temp < 68)
    System.out.println("cold");
else if (temp > 75)
    System.out.println("hot");
else
    System.out.println("just right");
```

There are many other ways to do this, obviously

11. Write code to compare two String variables, name1 and name2. Print "same" if they are equal.

```
if (name1.equals(name2))
    System.out.println("same");
```

12. What, if anything, is wrong with this if statement?

```
if. cost = 5;
{
    System.out.println("the cost is 5");
}
```

- ① no parens (cost == 5)
- ② cost == 5 need double = 5
- ③ don't want ; on if line

13. What is output by the following?

```
int a = 7;
int b = 10;
System.out.println(b==a);
```

false

14. What is output by the following?

```
String c = new String("tiger");
String d = new String("tiger");
System.out.print(c==d);
System.out.println(c.equals(d));
```

false true

15. The following code gets a String from the user and store it in **temp**. Write code to check if the String **temp** is in the variable **phrase**. If it is present, print "found", if not, print "not found."

```
String phrase = /*initialized with valid data */;
Scanner scan = new Scanner(System.in);
System.out.println("Enter a word: ");
String temp = scan.nextLine();
```

```
if (phrase.indexOf(temp) != -1)
    System.out.println("found");
else
    System.out.println("not found");
```

16. What is output?

```
int x = 31 % 8; // = 7
if (x > 10)
    System.out.println(1);
else if (x > 8)
    System.out.println(2);
else if (x > 6)
    System.out.println(3);
else if (x > 4)
    System.out.println(4);
else
    System.out.println(5);
```

3

17. Write the following method which accepts two integers as inputs and returns true if either of them is 13 or if their sum or difference is equal to 13 and returns false otherwise.

```
public boolean thirteenCheck(int a, int b) {
    if (a == 13 || b == 13)
        return true;
    if (a + b == 13)
        return true;
    if (Math.abs(a - b) == 13)
        return true;
    return false;
}
```

18. $!(x < y \ \&\& \ w == z)$ is the same as which boolean expression?

$x >= y \ || \ w != z$

- a. ~~$x <= y \ \&\& \ w == z$~~
- b. $x >= y \ || \ w != z$
- c. ~~$x < y \ || \ w != z$~~
- d. ~~$x <= y \ \&\& \ w != z$~~
- e. ~~$x < y \ \&\& \ w != z$~~

19. What is output by the following?

```
String temp = "I am the boss of 12345substrings!";
int x = temp.indexOf("ss");
String small = temp.substring(x+3, x+5);
System.out.println(small);
```

of

20. What is printed by the following?

```
String temp = "mars.lander";
System.out.println(temp.length());
```

11

21. What is output by the following?

```
String name = "Hays";
if(name.indexOf("Y") > -1) = -1
    System.out.print(1);
if(name.substring(1,2).equals("Ha")) a ≠
    System.out.print(2);
int x = name.length()-1;
if(name.substring(x).equals("s")) ✓
    System.out.print(3);
if(name.length()==3) > 4
    System.out.print(4);
else
    System.out.print(5); ✓
```

35

22. What is output by the following?

```
int a = 8;
String temp = "";
if(a<3)
    temp+="a";
if(a<7)
    temp+="b";
if(a<11) = c
    temp+="c";
if(a<15) = d
    temp+="d";
System.out.println(temp);
```

d

23. Write a single line of code to compare the given String variables and print "true" if they are equal and "false" if they are not equal.

Do this using a single line of code.

```
String x = /*initialized with valid data*/;
String y = /*initialized with valid data*/;
System.out.println(x.equals(y));
```

24. What is output by the following code?

```
int c = 7;
if(c<10) ✓
{
    System.out.println("A");
    if(c>8)
    {
        System.out.println("B");
    }
    else
        System.out.println("C");
}
```

A
C

The last question uses the following class:

```
public class Frog
{
    //attributes not shown

    public Frog() {
        //implementation not shown }

    public void hop(int n) {
        //moves Frog forward n spaces
        //implementation not shown }

    public int getLocation() {
        //returns Frog location
        //implementation not shown }
}
```

25. Consider the following code, which sets up a race between two Frogs, where each Frog hops forward by a random integer value from 1 to 10.

```
Frog a = new Frog();
Frog b = new Frog();
a.hop((int) (Math.random()*10)+1);
b.hop((int) (Math.random()*10)+1);
```

Write code to check and report which Frog wins the race. or if it is a tie.

```
if (a.getLocation() > b.getLocation())
    System.out.println("a wins");
else if (a.getLocation() <
         b.getLocation())
    System.out.println("b wins");
else
    System.out.println("tie");
```