Unit3_final_review

1. Consider the following method that is intended to determine if the double values d1 and d2 are close enough to be considered equal. For example, given a tolerance of 0.001, the values 54.32271 and 54.32294 would be considered equal.

```
/** @return true if d1 and d2 are within the specified tolerance,
 *          false otherwise
 */
public boolean almostEqual(double d1, double d2, double tolerance)
{
  /* missing code */
}
```

Which of the following should replace / * missing code * / so that almostEqual will work as intended?

(A) return (d1 - d2) <= tolerance;

(B) return ((d1 + d2) / 2) <= tolerance;

(C) return (d1 - d2) >= tolerance;

(D) return ((d1 + d2) / 2) >= tolerance;

(E) return Math.abs(d1 - d2) <= tolerance;

2. Assume that a and b have been defined and initialized as int values. The expression

! (! (a != b) && (b > 7))

is equivalent to which of the following?

(A) `(a != b) || (b < 7)`

(B) `(a != b) || (b <= 7)`

(C) `(a == b) || (b <= 7)`

(D) `(a != b) && (b <= 7)`

(E) `(a == b) && (b > 7)`

3. Assume that the boolean variables a, b, c, and d have been declared and initialized. Consider the following expression.

!(!(a && b) || (c || !d))

Which of the following is equivalent to the expression?

Unit3_final_review

(A) (a && b) && (!c && d)
(B) (a || b) && (!c && d)
(C) (a && b) || (c || !d)
(D) (!a || !b) && (!c && d)
(E) !(a && b) && (c || !d)

4. Assume that x and y are boolean variables and have been properly initialized.

```
(x || y) && x
```

Which of the following always evaluates to the same value as the expression above?

(A) x
(B) y
(C) x && y
(D) x | | y
(E) x != y

5. Assume that x and y are boolean variables and have been properly initialized.

```
(x && y) && !(x || y)
```

Which of the following best describes the result of evaluating the expression above?

(A) true always
(B) false always
(C) true only when x is true and y is true
(D) true only when x and y have the same value
(E) true only when x and y have different values

6. Assume that x and y have been declared and initialized with int values. Consider the following Java expression.

```
(y > 10000) || (x > 1000 && x < 1500)
```

Which of the following is equivalent to the expression given above?

(A) (y > 10000 | | x > 1000) && (y > 10000 | | x < 1500)
(B) (y > 10000 | | x > 1000) | | (y > 10000 | | x < 1500)
(C) (y > 10000) && (x > 1000 | | x < 1500)
(D) (y > 10000 && x > 1000) | | (y > 10000 && x < 1500)
(E) (y > 10000 && x > 1000) && (y > 10000 && x < 1500)

Unit3_final_review

7. Consider the following method, biggest, which is intended to return the greatest of three integers. It does not always work as intended.

```
public static int biggest(int a, int b, int c)
{
  if ((a > b) && (a > c))
  {
    return a;
  }
  else if ((b > a) && (b > c))
  {
    return b;
  }
  else
  {
    return c;
  }
}
```

Which of the following best describes the error in the method?

(A) biggest always returns the value of a.

(B) biggest may not work correctly when c has the greatest value.

(C) biggest may not work correctly when a and b have equal values.

(D) biggest may not work correctly when a and c have equal values.

(E) biggest may not work correctly when b and c have equal values.

Unit3_final_review

8. A teacher put three bonus questions on a test and awarded 5 extra points to anyone who answered all three bonus questions correctly and no extra points otherwise. Assume that the `boolean` variables `bonusOne`, `bonusTwo`, and `bonusThree` indicate whether a student has answered the particular question correctly.
Each variable was assigned `true` if the answer was correct and `false` if the answer was incorrect.

Which of the following code segments will properly update the variable `grade` based on a student's performance on the bonus questions?

I.
```
if (bonusOne && bonusTwo && bonusThree)
   grade += 5;
```

II.
```
if (bonusOne || bonusTwo || bonusThree)
   grade += 5;
```

III.
```
if (bonusOne)
   grade += 5;
if (bonusTwo)
   grade += 5;
if (bonusThree)
   grade += 5;
```

(A) I only
(B) II only
(C) III only
(D) I and III
(E) II and III

Unit3_final_review

9. Consider the following incomplete method, which is intended to return `true` if the value of `y` is between the values of the other two parameters and `false` otherwise.

```
/** Precondition: x, y, and z have 3 different values. */
public static boolean compareThree(int x, int y, int z)
{
     return /* missing condition */ ;
}
```

The following table shows the results of several calls to `compareThree`.

Call	Result
`compareThree(4, 5, 6)`	`true`
`compareThree(6, 5, 4)`	`true`
`compareThree(5, 4, 6)`	`false`
`compareThree(3, 4, 4)`	violates precondition

Which of the following can be used to replace `/* missing condition */` so that `compareThree` will work as intended when called with parameters that satisfy its precondition?

(A) `(x > y) && (x > z)`

(B) `(x > y) && (y > z)`

(C) `(x > y) || (y > z)`

(D) `(x > y) == (y > z)`

(E) `(x > y) != (y > z)`

10. Assume obj1 and obj2 are object references. Which of the following best describes when the expression obj1 == obj2 is true?

(A) When obj1 and obj2 are defined within the same method

(B) When obj1 and obj2 are instances of the same class

(C) When obj1 and obj2 refer to objects that contain the same data

(D) When obj1 and obj2 refer to the same object

(E) When obj1 and obj2 are private class variables defined in the same class

11. Which of the following best describes the value of the Boolean expression shown below?

```
a && !(b || a)
```

Unit3_final_review

(A) The value is always `true`.

(B) The value is always `false`.

(C) The value is `true` when `a` has the value `false`, and is `false` otherwise.

(D) The value is `true` when `b` has the value `false`, and is `false` otherwise.

(E) The value is `true` when either `a` or `b` has the value `true`, and is `false` otherwise.

12. Consider the following method.

```
public void conditionalTest(int a, int b)
{
  if ((a > 0) && (b > 0))
  {
    if (a > b)
      System.out.println("A");
    else
      System.out.println("B");
  }
  else if ((b < 0) || (a < 0))
    System.out.println("C");
  else
    System.out.println("D");
}
```

What is printed as a result of the call conditionalTest(3, -2)?

(A) A

(B) B

(C) C

(D) D

(E) Nothing is printed.

Unit3_final_review

13. Consider the following code segment.

```
int x = 7;
int y = 3;

if ((x < 10) && (y < 0))
  System.out.println("Value is: " + x * y);
else
  System.out.println("Value is: " + x / y);
```

What is printed as a result of executing the code segment?

(A) Value is: 21

(B) Value is: 2.3333333

(C) Value is: 2

(D) Value is: 0

(E) Value is: 1

14. Consider the following method.

```
public void test(int x)
{
  int y;

  if (x % 2 == 0)
    y = 3;
  else if (x > 9)
    y = 5;
  else
    y = 1;

  System.out.println("y = " + y);
}
```

Which of the following test data sets would test each possible output for the method?

(A) 8, 9, 12

(B) 7, 9, 11

(C) 8, 9, 11

(D) 8, 11, 13

(E) 7, 9, 10

15. The price per box of ink pens advertised in an office supply catalog is based on the number of boxes ordered.The following table shows the pricing.

Number of Boxes	Price per Box
1 up to but not including 5	$5.00
5 up to but not including 10	$3.00
10 or more	$1.50

The following incomplete method is intended to return the total cost of an order based on the value of the parameter numBoxes.

```
/** Precondition: numBoxes > 0 */
public static double getCost(int numBoxes)
{
  double totalCost = 0.0;

  /* missing code */

  return totalCost;
}
```

Which of the following code segments can be used to replace /* *missing code* */ so that method getCost will work as intended?

I.
```
if (numBoxes >= 10)
{
  totalCost = numBoxes * 1.50;
}
if (numBoxes >= 5)
{
  totalCost = numBoxes * 3.00;
}
if (numBoxes > 0)
{
  totalCost = numBoxes * 5.00;
}
```

Unit3_final_review

II.
```
if (numBoxes >= 10)
{
  totalCost = numBoxes * 1.50;
}
else if (numBoxes >= 5)
{
  totalCost = numBoxes * 3.00;
}
else
{
  totalCost = numBoxes * 5.00;
}
```

III.
```
if (numBoxes > 0)
{
  totalCost = numBoxes * 5.00;
}
else if (numBoxes >= 5)
{
  totalCost = numBoxes * 3.00;
}
else if (numBoxes >= 10)
{
  totalCost = numBoxes * 1.50;
}
```

(A) I only
(B) II only
(C) III only
(D) I and II
(E) II and III