Java
Unit 3 Practice Test

Name-

Period-

True/False

1. Dangling else errors have to do with short circuit evaluation.
2. Strings can be compared in an `if` statement with a == symbol.
3. DeMorgan's Law shows that !(!(A)) simplifies to A.
4. `"alpha".equals("Alpha")` evaluates to a boolean `true` value.
5. An `else` clause is not required in an `if` statement.
6. An `if` statement can have multiple `else if` clauses.
7. If the expression `num % 3` == 0 is `true` and `num` is a positive integer then the value stored in the variable `num` is evenly divisible by 3.
8. The && symbol is a logical operator in Java.
9. In Boolean algebra, A || A is equivalent to A.
10. If the variable `gameIsOver` is a `boolean` variable, then the control expression `(gameIsOver)` could be used in an `if` statement.
11. If the variable `menuChoice` is an `int`, then the control expression `(menuChoice = 3)` could be used with an `if` statement.
12. A <= operator has a higher precedence according to the Java order of operations than the `||` operator.
13. Short circuit evaluation is also known as lazy evaluation.
14. If `a=1`, `b=2`, & `c=3`, then the Boolean expression `(0 > b || b > 0 && b > 1)` evaluates to `false`.
15. A && (A || B) = A is a Boolean algebra identity that can be used to simplify complicated Boolean expressions.
16. The statement `letter = grade >= 90 ? 'A' : 'B';` shows how the selection operator can be used.
17. When comparing floating-point values it is wise to use the `equals` method rather than the == due to precision loss with the double data type.
18. A predicate method can have a `void` return type.
19. The || symbol is the Boolean OR operator in Java.
20. The primitive data type `Boolean` is used to store `true` and `false` values in Java.
21. A *side effect* is unintended consequence of a programmer's code that often leads to a compile error.

Write the Code – Use the back of the paper if necessary.

1. Write a single `if` statement that displays the message "You lost" if the variable score is less than 50 and "You won" otherwise.

2. Write a method named `computeGrade` that returns "C" if the value of the parameter `gpa` is less than 2.5. If the value of `gpa` is between 2.5 inclusive and 3.5 exclusive, the method returns "B". If `gpa` is greater than or equal to 3.5, "A" is returned.

```
// precondition: gpa is between 0.0 and 4.0 inclusive
// postcondition: "C" is returned if gpa is less than 2.5, "B" is returned if gpa is between 2.5 inclusive
// and 3.5 exclusive and "A" is returned if gpa is greater than or equal to 3.5
public String computeGrade(double gpa)
{








}
```

3. Write a method named `largestSecondLetter` that returns whichever `String` parameter has a second letter that is alphabetically less than the second letter of the other parameter. You can assume that all characters in each parameter are lowercase. For example, if `word1= "apple"` and `word2= "banana"` then `"banana"` is returned since 'a' is less than 'p'.

```
// precondition: word1 & word2 consist only of lowercase letters and each have at least one letter
// postcondition: word1 is returned if the second letter of word1 is alphabetically less than
// or equal to the secondLetter of word2. However, word2 is returned if its second letter
// is alphabetically less than the second letter of word1
public String largestSecondLetter(String word1, String word2)
{








}
```

4. Simplify the following Boolean expression. Show as many detailed steps as possible for full credit.

(A || B) && !(A || B)

5. Draw a complete truth table below. It must be created in the precise format that we reviewed.

6. Write the hello world program.