What is your name?: ___________________________(4 points for writing it on your answer sheet)

There are two sections:
  I. True/False. . . . . . . . . . . . . . . . . . . . . 66 points; ( 33 questions, 2 points each)
  II. Multiple Choice . . . . . . . . . . . . . . . 30 points; ( 10 questions, 3 points each)

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96 + 4 points for name = 100 points total

This test is worth 10% of your final grade. Please fill in your answers on the bubble form. After the test you may keep these pages, but you must turn in your bubble form. This test is open book and open notes. You have 50 minutes.

• For the multiple choice problems, select the best answer for each one and select the appropriate letter on your answer sheet.
• Be careful - more than one answer may seem to be correct. Many questions are tricky.
• Some problems ask you to determine whether something is valid. Something is valid if it would not generate a compiler error and would execute without the program crashing.

I. True/False: (2 points each)

T  F  1. In BlueJ, you don’t have to have a main( ) method, even though normally you do in a Java project.
T  F  2. If separate lines in a program accidentally get put onto the same line, even though the program will compile properly, it will not run properly.
T  F  3. There are three different looping structures in Java, however any program could be rewritten using only one of them.
T  F  4. The && boolean operator in Java is useful in combining two different conditions which must both be true before the code inside an if statement is executed. A logically equivalent program could be written without the use of &&, using an extra if statement instead.
T  F  5. One way to make a variable into a constant in Java is to use the const keyword.
T  F  6. Reserved words in Java can be used as variables if the capitalization of the first letter is changed.
T  F  7. Curly braces { } can be used interchangeably with parenthesis ( ) in Java to mark a block of code.
T  F  8. Indentation is only for humans to look at in a Java program. The compiler doesn’t care whether or not Java code is indented properly.
T  F  9. Code that loops a predetermined number of times is best represented using a counter variable with a while loop.
T  F  10. A for loop could be used with a boolean ending condition variable to determine whether or not a program is done.
11. A sequence of if-else statements to handle menu options should not be indented inside each other.

12. Consider a sequence of if-else statements that handle assigning a letter grade ('A'..'F') based on a numerical score (0..100). These if-else statements should not be indented inside each other.

13. The output of the following lines of code is: Yes
   ```java
   String w1 = "Yes";
   if (w1=="Yes")
       System.out.println("Yes");
   else
       System.out.println("No");
   ```

14. The output of the following lines of code is: Yes
   ```java
   String w1 = "Yes";
   String w2 = new String("Yes");
   if (w1==w2)
       System.out.println("Yes");
   else
       System.out.println("No");
   ```

15. The output of the following lines of code is: Yes
   ```java
   boolean False = false;
   if (False = true) {
       System.out.println("Yes");
   }
   else {
       System.out.println("No");
   }
   ```

16. The output of the program segment below is the text: Medium Large
   ```java
   int x = 2;
   if ( x > 5) if ( x < 3 )
       System.out.print("Small"); else
       System.out.print("Medium");
   System.out.println(" Large");
   ```

17. The output of the program segment below is: anarchy rules
   ```java
   String jumbo = "anarchy ";
   String shrimp = "rules ";
   System.out.println("jumbo" + "shrimp");
   ```

18. The easiest way to line up numbers of various sizes in a table is using `System.out.printf()`

19. The output of the following statement is the value: B
   ```java
   char B = 'A';
   System.out.println( B );
   ```
20. The output of the following statements is:

```
String theWord = "12345";
System.out.println("" + theWord.charAt(1) + " Done");
```

21. The output of the following statement is:

```
System.out.println(7 / 2);
```

22. The output of the following statement is:

```
System.out.println(2 * 3.5 / 2);
```

23. The output of the following statement is:

```
System.out.println(2 + 3 * 2);
```

24. Programs used to use *goto* statements, but now more commonly use constrained forms of *goto* by using the *continue* and *break* statements.

25. Any code that could be written using a *goto* statement can be written without a *goto* statement.

26. Several lines of code that include // style comments, can all be commented out as a chunk of code by using /* */ style comments.

27. The following code is valid (compiles and runs) in Java:

```
for( ; ; )
```

28. The output of the following code in Java is:

```
int x, answer;
for(x=1, answer=0; x<100; x++) {
    answer = answer + x;
    x++;
}
System.out.println(answer);
```

29. The output of the statement below is:

```
System.out.println(-7 % 3);
```

30. The following would give a compiler error in Java:

```
int x = 1, y = x + 2;
```

31. Constructors in a class must all have the same name.

32. Methods in a class must all have different names.

33. The following code prints the words: 

```
char c='c';
switch (c){
    case 'c': System.out.print("third");
    case 'b': System.out.print("second");
    case 'a': System.out.print("first");
    break;
}
System.out.println(" Done");
```
II. Multiple Choice

1. Consider the program segment given below. Its output is:

```java
int answer = 1;
for (int i=1; i<3; i++) {
    answer = answer * i;
}
System.out.println(answer);
```

a) 0  
b) 2  
c) 4  
d) 6  
e) None of the above

2. Consider the program segment given below. Its output is:

```java
int x = 2;
int y = 3;
String z = "";
System.out.println(x + y + z + " is the answer");
```

a) 2 + 3 is the answer  
b) 5 is the answer  
c) 23 is the answer  
d) 2 3 is the answer  
e) None of the above

3. Consider the program segment given below. Its output is:

```java
String x = "";
int y = 2;
int z = 3;
System.out.println(x + y + z + " is the answer");
```

a) 2 + 3 is the answer  
b) 5 is the answer  
c) 23 is the answer  
d) 2 3 is the answer  
e) None of the above
4. Consider the code given below. Its output is:

```java
int x = 3;
int y = 6;
int z = x++ + y;
System.out.println("Value is: "+x+y+z);
```

a) Value is: 369
b) Value is: 469
c) Value is: 4610
d) Value is: 3710
e) None of the above

5. What is the output of the program segment below when an instance of class Check is created and used to call method checkIt()?

```java
class Check
{
    int x = 0;

    void checkIt()
    {
        if( one())
            if( two())
                x++;
        System.out.println( x);
    }

    boolean one()
    {
        x++;
        return true;
    }

    boolean two()
    {
        x++;
        return false;
    }
}
//end class Check
```

a) 0
b) 1
c) 2
d) 3
e) None of the above
6. Consider the code given below. If its output is:

   9    12
   12   16
   15   20
   18   24

what are the values for variables start, end, first and last?

   a) int start=3, end=6, first=3, last=4;
   b) int start=1, end=4, first=9, last=12;
   c) int start=9, end=4, first=9, last=2;
   d) int start=2, end=4, first=4, last=2;
   e) None of the above

7. Assume the code shown below right is stored in a file named

   Problems.java

   Assume that if it ran correctly, the output would be:

   2 4 6 8 10
    eschew surplusage
     End

   How many errors can you find that would prevent this code from running correctly if it were invoked in
   BlueJ by calling method runIt()?

   a) 1 or 2
   b) 3 or 4
   c) 5 or 6
   d) 7 or 8
   e) None of the above
8. Consider method `first` shown at right. How would you best describe its return value?

   a) $x + y$
   b) $x \times x$
   c) $x \times y$
   d) $x^y$
   e) None of the above

9. Consider method `second` shown at right. How would you best describe its return value?

   a) $x + y$
   b) $x \times x$
   c) $x \times y$
   d) $x^y$
   e) None of the above

10. Consider the BlueJ Shapes example discussed in class that allows us to create Squares, Triangles, and Circles. Consider what the code might look like if we wanted to create a tic-tac-toe board that looks like what is shown below, where we need to be able to place an X or an O in each square.

![Tic-Tac-Toe Board](image)

Which approach shown below would be the best?

   a) Define a variable of type Square, then reuse it to create 9 squares.
   b) Define 9 different Square variables.
   c) Define 10 Square variables, one used for the outer edge
   d) Draw a square for the outline, then draw 4 lines inside it
   e) None of the above