What is your name?: __________________________(3 points for writing it on your answer sheet)

There are two sections:
  I. True/False. . . . . . . . . . . . . . . . . . . . . 70 points; (35 questions, 2 points each)
  II. Multiple Choice . . . . . . . . . . . . . . . 27 points; (9 questions, 3 points each)

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97 + 3 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. The name of a Java class should match the file name.
T  F  2. Java insists that your program have at least one comment line, otherwise you will get an error.
T  F  3. Java programs written in BlueJ can’t run as-is. They must first be translated into something the machine understands.
T  F  4. Any program that can be written using _for_ loops could be rewritten, substituting _do-while_ loops (and possibly a few other lines of code) in place of each _for_ loop.
T  F  5. Any program that can be written with _if-else_ statements could be re-written using only _if_ statements without the else parts.
T  F  6. Any _variable_ in Java declared as _final_ becomes a Java _reserved word_.
T  F  7. Every _if_ statement must use curly braces {} as part of the statement, otherwise it will not compile.
T  F  8. Every _if_ statement must use parenthesis ( ) in the decision part of the statement, otherwise it will not compile.
T  F  9. A sequence of _if-else_ statements to handle menu options should not be indented inside each other.
T  F  10. 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.
11. The output of the following lines of code is: No
    String w1 = "Yes";
    if (w1=="Yes")
        System.out.println("Yes");
    else
        System.out.println("No");

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

13. The output of the program segment below is the text: Two Done
    int x = 3;
    if (x < 3) {
        if (x <=5 )
            System.out.println("One");
        } else {
            System.out.println("Two");
        }
    System.out.println(" Done");

14. The output of the program segment below is: Absolutely whatever you say
    String will = "you ";
    String No = "Absolutely ";
    String I = "say";
    String way = "whatever ";
    System.out.println(No + way + will + I);

15. The following two statements give the same output:
    int quantity = 13;
    System.out.println("Price is: " + quantity + " dollars.");
    System.out.printf("Price is: %d dollars\n", quantity);

16. Using System.out.printf() is more convenient for formatting floating point numbers than is System.out.println().

17. The following two statements give the same output:
    System.out.println("Code number is: 67");
    System.out.println("Code number is: " + (int)'C');

18. The output of the following statement is the value: B
    char c='A';
    System.out.println( 1 + 'A' );
19. The output of the following statement is the value: 7
   System.out.println( Integer.parseInt("7") );

20. The output of the following statements is: 7
    String theWord = "program";
    System.out.println( theWord.charAt( 6) );

21. The output of the following statement is: 2.33333
    System.out.println( 7 / 3);

22. The output of the following statement is: 3
    System.out.println( 2 * 3.5 / 2);

23. The following statement would compile and run:
    for( int i=0, sum=0; sum<10; sum+=i, i++);

24. Consider the following statements of code using the BlueJ shapes example discussed in class:
    Square theSquare = new Square();
    System.out.println( theSquare);
    If this code prints out just a number, that means that most likely the toString() method has not been implemented in the Square class.

25. The output of the following statement is: 7
    System.out.println("Length of \"seven\" is: " + "seven".size() );

26. Inside a loop if a continue statement is followed by a break statement, then they cancel each other out and it is the same as if both of them were not there.

27. Inside a loop if a break statement is encountered, execution resumes at the next line immediately following the loop.

28. The following code is valid (compiles and runs) in Java:
    for( ; ; );

29. The output of the following code in Java is the sum of positive even integers less than 20:
    int x, answer;
    for(x=1, answer=0; x<20; x++)
      if( x%2 == 0) answer+=x;
    System.out.println( answer);

30. The output of the statement below is: -1
    System.out.println( -5 % 2);

31. The following would give a compiler error in Java:
    int x, y;
    x + y = 3;
32. The following code prints out: Result is: 10
   
   int x=2;for(int i=0; i<5; i++) {x+=i;}
   System.out.println("Result is: " + x);

33. The following code prints the words: Give me ambiguity or give me something else
   
   int value = 7;
   System.out.print("Give me ambiguity ");
   if (2 < value < 10)
      System.out.print("or give me ");
   else
      System.out.print("on second thought ");
   System.out.print(" something else");

34. The following code prints the words: 321Done
   
   int x=3;
   switch (x){
      case 3: System.out.print("3");
      case 2: System.out.print("2");
      case 1: System.out.print("1");
      break;
   }
   System.out.println("Done");

35. The equals() method should be implemented in every class you write that others may use someday.
II. Multiple Choice

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

```java
int answer = 0;
for (int i=0; i<5; i++) {
    answer = answer + i;
}
System.out.println(answer);
```

a) 0  
b) 4  
c) 10 
d) 20 
e) None of the above

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

```java
String x = "";
int y = 3;
int z = 5;
System.out.println(x + y + z + " is the answer");
```

a) 3 + 5 is the answer  
b) 8 is the answer  
c) 35 is the answer  
d) 3 5 is the answer  
e) None of the above

3. Consider the code given below. Its output is:

```java
int y = 2;
int x = 5;
int z = x+++y;
System.out.println("Value is: " + x + y + z);
```

a) Value is: 527  
b) Value is: 628  
c) Value is: 538  
d) Value is: 639  
e) None of the above
4. 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() && two() )
            x++;
        System.out.println(x);
    }
    boolean one() {
        x++; return false;
    }
    boolean two() {
        x++; return true;
    }
}
```

```java
for( int j=k; j<=n; j++) {
    for( int i=r; i<r+j; i++) {
        System.out.printf("%5d", i*j);
    }
    System.out.println();
}
```

a) 0  
b) 1  
c) 2  
d) 3  
e) None of the above

5. Consider the code given below. If its output is:

```
9   12   15
12   16   20   24
15   20   25   30   35
```

what are the values for variables `k`, `n`, and `r`?

```java
for( int j=k; j<=n; j++) {
    for( int i=r; i<r+j; i++) {
        System.out.printf("%5d",i*j);
    }
    System.out.println();
}
```

a) int k=4, n=3, r=5;  
b) int k=3, n=5, r=3;  
c) int k=3, n=4, r=5;  
d) int k=3, n=5, r=4;  
e) None of the above
6. What is the output of the code given in the two columns below when an instance of class `Confuse` is created and used to call method `startUp()`?

```java
class Confuse {
    int x=2;
    int y=5;

    private void first(int y, int x) {
        x += 2; y += 3;
    }

    private void second(int x, int s) {
        x += 5; y = 4;
    }

    private void third(int y) {
        setXY( y);
        x += 2; y += 3;
    }

    private void setXY( int y) {
        x = y;
        this.y = x+1;
        second(y, x);
    }

    private void display() {
        System.out.println(x + y);
    }

    public void startUp() {
        int x=3, y=2;
        first(x,y);
        second(x,y);
        third(4);
        display();
    }
}
```

a) 8  
b) 9  
c) 10  
d) 11  
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, 2, or 3
- b) 4 or 5
- c) 6 or 7
- d) 8 or 9
- e) None of the above

```java
class Problem {
    int counter = 5;
    int runIt() {
        runOnce();
        System.out.println("End");
    }
    void runOnce(int counter) {
        for (int i=0; i<=counter; i++) {
            System.out.println(i*2);
            System.out.println("eschew ");
            System.out.println("surplusage");
        }
    }
}
```

8. Consider methodA 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

```java
public int methodA(int x, int y) {
    int z=0;
    for (int i=0; i<y; i++) {
        z = z + x;
    }
    return z;
}
```

9. Consider methodB 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

```java
public int methodB(int x, int y) {
    int z=1;
    for (int i=0; i<y; i++) {
        z = methodA(z, x);
    }
    return z;
}
```