Test 1.5

Name: _____

1. What are the two parts of an Object?

_____  &  _____

Questions:                                          Definitions:

2. What is an Object?                    A. A function with the same name as
                                                              it's containing class that creates and
                              _____              sets up Objects
3. What is a Class?
                                                     B. A code blueprint for creating
                              _____              Objects
4. What is a method?
                                                     C. Related variables and functions,
                              _____              encapsulated in a single data type

5. What is a field?                       D. A class variable

                              _____          E. A class function
6. What is a constructor?

                              _____

7. Given the following Class definition, supply the appropriate answers:

```
public class Bubble {
    int x, y, radius, col;
    Bubble(int startX, int startY, int rad, int c){
        x = startX;
        y = startY;
        radius = rad;
        col = c;
    }
    public void floatUp(){
        if(y < 0){
            y = height;
        }
        y--;
    }
    public void drawBubble(){
        noFill();
        stroke(col);
        ellipse(x, y, radius, radius);
    }
}
```

A.
    What are the fields?

    _____

B.
    What are the methods?

    _____

C.
    What parameters does the
    constructor take?

    _____

D.
    Circle and Label the 'two parts of
    an Object' defined by this Class

8. Draw a UML Class Diagram for the Class defined in the previous question (#7)

9. What does a Class definition look like for the following scenario:
   a. A Class named 'Tree' containing
      i. a field of type integer called 'leafCount'
      ii. a field representing an array of Leaf Classes called 'leafList'
      iii. a field of type double called 'treeHeight'
      iv. a constructor that takes no arguments and initializes 'leafCount' and 'treeHeight' to zero
      v. a method called 'grow' that returns nothing, takes no arguments, and increments 'leafCount' and 'treeHeight' by one

10. Draw a UML Class Diagram for the Class defined in the
    previous question (#9), as well as:
    a. A Leaf Class with:
        i. a field of type integer called 'color'
        ii. a constructor that takes no arguments
        iii. a method called 'changeColor' that returns an integer and takes no
             arguments
    b. A Plant Class with:
        i. a field of type boolean called 'needsSunlight'
        ii. a constructor that takes no arguments
        iii. a method called 'wilt' that returns a double and takes no arguments
    c. The Tree Class should inherit from Plant Class and the Leaf Class should
       belong to the Tree Class

11. Write a function called 'oddSum' that:
    a. returns an integer and takes no arguments
    b. sums up all odd numbers from 0 to 50 using a loop
    c. returns the value of the sum

12. Write a function called 'getMax'
    a. returns an integer and takes an array of integers as an argument
    b. loops through all the values in the array given and finds the maximum value
    c. returns the maximum value

13. Write a function called 'computeAverage' that:
    a. returns a double and takes an array of doubles as an argument
    b. computes the average of all the values of the array given as an argument
    c. returns the value of the average

14. Write a function called 'isEven' that:
    a. returns an integer and takes a single integer argument
    b. returns one if the argument is even, or zero if the argument is odd




15. Explain the purpose of using Objects and Classes:



16. Explain the purpose of writing functions:



17. Explain what the keyword 'static' means in the context of Java classes



18. Explain what a Java ArrayList is and what it can do



19. Explain what a Java HashMap is and what it can do



20. Explain what a Java Scanner is and what it can do