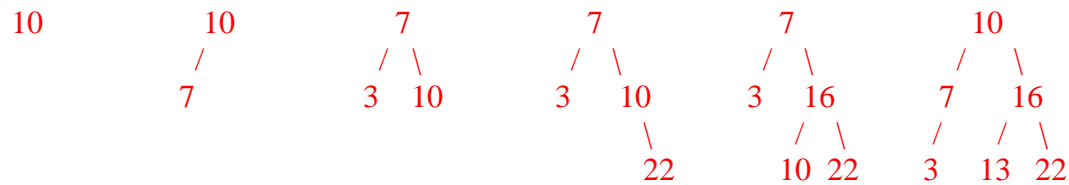**3)** (10 pts) ALG (AVL Trees)

Show the result of inserting the following values into an initially empty AVL tree:

10, 7, 3, 22, 16, 13, 5, 18, 20 and 19.
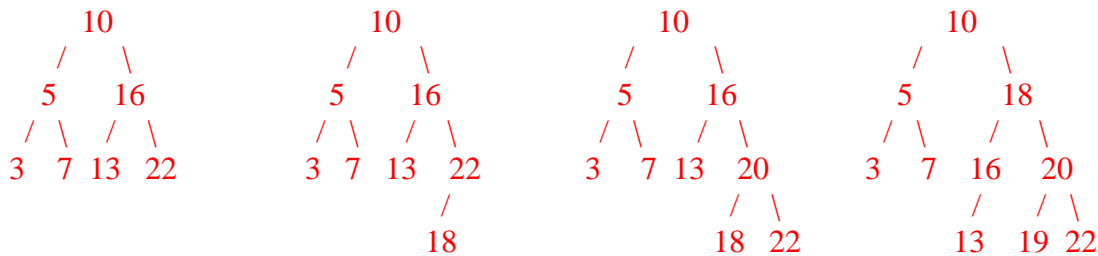
Draw a box around your result *after each insertion.*

The resulting trees are as follows:

```
Tree 1:      Tree 2:       Tree 3:      Tree 4:       Tree 5:        Tree 6:

10             10            7            7             7              10
              /            / \          / \           / \            /   \
             7            3   10        3   10        3   16         7    16
                                         \           / \           /   / \
                                          22        10  22        3   13  22
```

```
Tree 7:                Tree 8:                Tree 9:                   Tree 10:

    10                     10                     10                       10
   /   \                  /    \                 /    \                   /    \
  5    16                5     16               5     16                 5     18
 / \  / \              / \   / \              / \   / \               / \    / \
3  7 13  22           3  7  13   22          3   7 13   20            3  7  16   20
                              /                     / \                    /   / \
                            18                    18  22                 13  19  22
```

Grading: 1 pt per tree, try to judge each insertion based on their previous tree (so they can get a point even if their answer doesn't match as long as it is correct based on their previous tree.)

Computer Science Foundation Exam

January 13, 2018

Section II A

ALGORITHMS AND ANALYSIS TOOLS

SOLUTION

**NO books, notes, or calculators may be used,
and you must work entirely on your own.**

Question #	Max Pts	Category	Passing	Score
1	10	ANL	7	
2	5	ANL	3	
3	10	ANL	7	
TOTAL	25		17	

You must do all 3 problems in this section of the exam.

Problems will be graded based on the completeness of the solution steps and <u>not</u> graded based on the answer alone. Credit cannot be given unless all work is shown and is readable. Be complete, yet concise, and above all <u>be neat</u>. For each coding question, assume that all of the necessary includes (stdlib, stdio, math, string) for that particular question have been made.