COSC 201 Review Questions
Midterm #2
Fall 2016

1.) List and describe the four problems that need to be solved for the RSA encryption scheme?

2.) List the four things that Weiss believes to be essential to recursive solutions.

3.) What is the issue with the following solution to the Fibonacci problem?

```
public int fib(int a){
        if (a == 0 | a == 1) return 1;
        return (fib(a-1) + fib(a-2));
}
```

What is the solution to the issue above?

4.) Give a recursive method to print all permutations of a String s.

5.) Create a PriorityQueue of Strings. Add the following Strings to the queue: "Alan", "COSC 201", "Computer", "Science", "Schaefer", "SMCM". If we printed out this queue in order, what would print?

6.) Create a TreeSet of Integers and add the following integers to that Set:

1, 4, 2, 9, 2, 13, 6, 10

7.) Declare and instantiate an Integer Queue in Java. Add the following numbers to the Queue: 1, 4, 22, -4, 3, 1. If we printed the Queue out in order, what would print?

8.) Give the postfix for the following infix notation equation and then evaluate (show all work):

1 + 2 * 3 / 5 ^ 3 ^ 2 + 4 – (6 + 7 * 8 ^ (7 + 8) * 9)

9.) Convert 234 from base 10 to base 13.

10.) What is required in order to have a class I've created (Student) be able to be added to a HashSet without fear of accidental duplicates or accidental deletions?

11.) What is the internal data representation for a TreeSet?

12.) Give the recursive solution for modular exponentiation we discussed in class and discuss why it works.

13.) Given the sequence [45, 33, 12, 2, 19, 10, 8, 1, 9] show me how an merge sort would sort this sequence. I must see all steps.