Quiz 4
EECS 203
Spring 2015

Name (Print): _____

uniqname (Print): _____

Instructions. You have 25 minutes to complete this quiz. You may not use any sources of information, including electronic devices, textbooks, or notes. Leave at least one seat between yourself and other students. Please write clearly. If we cannot read your writing, it will not be graded.

Honor Code. This course operates under the rules of the College of Engineering Honor Code. Your signature endorses the pledge below. After you finish your exam, please sign on the line below:

I have neither given nor received aid on this examination, nor have I concealed any violations of the Honor Code.

_____

Page #	Points
1	/22
2	/8
Total	**/30**

1) Circle all of the following that are **TRUE**. **(4 points, -2 per wrong answer, minimum 0)**

- Perhaps the largest difference between a public and private key system is that a private key system relies upon having shared a "key" securely ahead of time, while a public key scheme does not.

- The RSA scheme covered in class makes it difficult to convert between the public key and the private key because to do so requires finding the prime factorization of the encryption exponent "e".

- In RSA, the public key, "n" is generally the product of two very large primes.

- It is very common to use private key encryption to exchange public keys.

2) How many bit strings of length 7 either start with "11" or end with "11" (or both)? **[4]**

3) How many bit strings of length 7 have a substring of "111" (so at least 3 ones in a row) in it? **[4]**

4) Use Fermat's Little Theorem to find 7^{123} mod 11. **[4]**

5) How many poker hands consist of 2 pairs? That is two of one rank of card, two of another rank of card, and one of a third rank of card? Recall that a poker hand consists of 5 cards and a deck of cards consists of 4 suits each with one card of the 13 ranks. You may leave your answer as an equation. **[6]**

6) Prove or disprove the following statement:

A computer network consists of five computers. Each computer is directly connected to at least one of the other computers. Show that there are at least two computers in the network that are directly connected to the same number of other computers. **[8 points]**