Name (PRINTED): ____________________

Student ID #: ____________________

Section # (or TA's: name and time) ____________________

CMSC 250 Quiz #12 Wednesday, Apr. 21, 2004

Write all answers legibly in the space provided. The number of points possible for each question is indicated in square brackets – the total number of points on the quiz is 30, and you will have exactly 15 minutes to complete this quiz. You may not use calculators, textbooks or any other aids during this quiz.

Note: you only need to take the answer as far as a mathematical expression including addition, subtraction, multiplication, division, exponents and factorials.

1. [15 pnts.] Assume you have fruit to sell in your fruitstand. You have 7 apples, 4 oranges and 6 bananas. Fruit of the same type are indistinguishable from each other.

   You make a fruit basket to deliver to a friend at the hospital. It has 5 pieces of fruit in it. Answer the following questions about that fruit basket assuming you filled the fruit basket at random (not thinking about what the friend likes or what would look good in the basket). Assume the order you put the fruit into the basket does not make the basket different.

   a. How many different baskets can be created with the criteria above?

   b. What is the probability that all of the fruit in the basket are apples?

   c. Assuming you must have at least one of each type of fruit in the basket, how many different baskets could be formed?

   d. Assume your friend received 2 baskets where the first basket has has 3 apples and 2 oranges and the second basket has 2 apples and 3 bananas. Your friend lines up the fruit in a strait line to decide in what order to eat them. How many different linear arrangements can he make assuming the fruit of the same type is indistinguishable?

2. [15 pnts.] Assume you have 27 indistinguishable chocolate candy bars and 5 distinguishable friends. Your friends want you to share the candy bars with them. Each of the questions is separate from the others - any conditions mentioned in one question do not carry to any of the others.

   Note: you only need to take the answer as far as a mathematical expression including addition, subtraction, multiplication, division, exponents and factorials.

   a. How many ways can you distribute the candy bars among yourself and your 5 friends?

   b. You don't want any of your friends (or yourself) to be left out of the candy bar eating so you recalculate - how many ways are there to distribute the candy bars among yourself and your five friends assuming you want to be sure that each person gets at least two candy bars?

   c. You decide these candy bars are small so instead of each person receiving at least two as mentioned in the previous question, you want to be sure you and each of your friends each receive at least 5 candy bars. Now, how many ways to distribute the candy bars?

   d. Bill one of the friends is allergic to chocolate, so you need to make sure he does not receive any of the candy bars. Now how many ways are there to distribute them? (remember ignore restrictions in previous questions)

   e. Since Bill is allergic to chocolate and can't eat the candy bars, you will add 12 peppermint candycanes to the candy you are distributing. How many ways can you distribute the candy assuming Bill can not eat the chocolate candy bars, but he can eat the peppermint candycanes?