CSIEB0080-Quiz 4
Dec. 03, 2012 14:10 pm ~ 15:30 pm

Instructor: PaoLien Lai
Closed book

Student name:_____ Student number: _____

There are 8 questions and 100 marks total. Please write an answer and the detailed calculation to each of the following questions. **(Note, you can only write down the related formulas for the answers if the exact numbers are too big)**

1. (20 points) A coin is flipped ten times where each flip comes up either heads or tails. How many possible outcomes
   (a) 、 are there in total?
   (b) 、 contain exactly three heads?
   (c) 、 contain at least three heads?
   (d) 、 contain the same number of heads and tails?
2. (10 points) How many ways are there for 8 women and 5 men stand in a line so that no two men stand next to each other? (Hint: first position the women and then consider possible positions for the men)
3. (10 points) How many strings of 18-decimal digits are there that contain one 0, four 1s, there 2s, one 3, two 4s, three 6s, two 7s, and two 9s?
4. (10 points) How many ways are there to travel in xyz space from the origin (0,0,0) to the point (2,7,5) by taking steps one unit in the positive x, positive y, or positive z direction?
5. (15 points) How many positive integers between 4 and 32?
   (a) are divisible by 3? Which integers are these?
   (b) are divisible by 5? Which integers are these?
   (c) are divisible by 3 and by 5? Which integers are these?
6. (10 points) There are 39 different time periods during which classes at a university can be scheduled. If there are 677 different classes, how much minimum number of rooms will be needed?
7. (10 points) What is the coefficient of x^7 in $(1+x)^{12}$?
8. (15 points) How many solutions are there to the equation $x_1+x_2+x_3+x_4+x_5=20$, where x_i, i=1,2,3,4,5, is a nonnegative integer such that
   (a) $x_1 \geqq 1$?
   (b) $x_i \geqq 2$ for i=1,2,3,4,5?
   (c) $0 \leqq x_1 \leqq 8$?