MATH 579 Exam 3 Part II; 2/25/10

Please read the exam instructions.

No books or notes are permitted for this exam; calculators are permitted though. Please write your answers on separate paper, indicate what work goes with which problem, and put your name or initials on every sheet. Cross out work you do not wish graded; incorrect work can lower your grade, even compared with no work at all. Keep this sheet for your records. Show all necessary work in your solutions; if you are unsure, show it. Simplify all numerical answers to be integers, if possible. Please attach part I to your solutions. You have 35 minutes. If you wish, you may hand in solutions to all six problems (part I and II) on the next class day, March 2. For more details, see the syllabus.

PART II: Choose three problems only from these five.

1. (5-8 points) How many four-digit positive integers are there in which all the digits are different?
2. (5-10 points) You need to visit four cities, each of them three times. How many ways can you do this if you're not allowed to start and end in the same city?
3. (5-10 points) How many permutations of $[n]$ are there such that the sum of every two consecutive elements is odd?
4. (5-10 points) How many ways are there to place three red, two white, and one green rook on a chessboard so that none of them attack any other?
5. (5-12 points) How many solutions are there to $x_1 + x_2 + x_3 = 25$ such that $x_i \in \mathbb{N}_0$ and $x_1 \geq 4$?