COS 522 Complexity - Spring 2006 - Final Take Home Exam

- Read these instructions carefully *before* starting to work on the exam. If any of them are not clear, please email me before you start to work on the exam.

- **Schedule:** You can work on this exam in a period of 48 hours of your choice between May 1st to **May 15th 1:30pm**. The exam needs to be submitted to **Mitra Kelly (Room 323)** by May 15th 1:30 pm. *This is a strict deadline.* You may submit the exam earlier. If you typed up your exam, I would appreciate it if you also email me a copy of it at the same time. In any case, please email me when you have submitted the exam.

- **Restrictions , honor code:** You should work on the exam alone. You can use your notes from the class, the homework exercises and their solutions, the textbook and the handouts I gave in class. You can also use any personal summaries and notes of the material that you prepare before starting to work on the exam. *You should not use any other material while solving this exam.* You should write and sign the honor pledge on your submitted exam (the pledge is "I pledge my honor that I did not violate the honor code during this exam and followed all instructions").

- **Writing:** You should answer all questions *fully*, *clearly* and *precisely*. When describing an algorithm or protocol, state clearly what are the inputs, operation, outputs, and running time. When writing a proof, provide clear statements of the theorem you are proving and any intermediate lemmas or claims. I recommend that you first write a draft solution of all questions before writing (or preferably, typing) up your final submitted exam.

- **Partial solutions:** If there is a question you can not solve fully, but you can solve a partial/relaxed version or a special case, then please state clearly what is the special case that you can solve, and the solution for this case. You will be given partial credit for such solutions, as long as I feel that this special case captures a significant part of the question's spirit.

- **Quoting results:** You can quote without proof theorems that were proven in class. You can also use without proofs standard mathematical tools such as Chernoff bounds, and concepts from linear algebra (inner product, eigenvalues etc.). However, you should quote the results precisely, and give a reference to the date and number the result was proven, or to the place in the textbook where the result is stated. When solving a question, you can use the results of a previous question as given, even if you did not manage to solve it.

- **Points:** The exam has 6 questions, with each worth 20 points (total of 120 points).

- **Clarifications:** I have made an effort to make the questions as clear and unambiguous as possible. In case any clarifications are needed, I will try to be always available by email. You can also email me with your number and good times to call, and I will call you back. If you need me more urgently, you can call me at my cell phone 917-674-6110 between 11am and 10pm eastern time. If there are any unresolved doubts, please write your confusion as part of the answer and maybe you will get partial credit.