Name: _____

Final Exam

Wednesday 10 May 2000

1. Client / server communication can be implemented using message-passing, but there are disadvantages to this implementation. How can client / server communication be improved when the items below are introduced?

    a. Remote procedure calls (10 points)

    b. Remote procedure calls and threads (10 points)

2. Write pseudo-code to "define" the semaphore P and V operations. (Note that this is a general question, not a Nachos question.) (15 points)

3. Summarize Ricart and Agrawala's algorithm for mutual exclusion in a distributed environment. (20 points)

4. Describe the general tradeoffs between deadlock detection and recovery, and deadlock prevention, in a distributed system. (15 points)

5. Explain how the private workspace and writeahead log are used in implementing atomic transactions. (15 points)

6. Under what circumstances, and why, can receiver-initiated load distribution algorithms become unstable? Are sender-initiated load distribution algorithms unstable under these same circumstances? Explain. (15 points)

7. Describe write-through and write-back cache modification as they are used in distributed file systems, and the advantages and disadvantages of both approaches. (15 points)

8. Distinguish between symmetric and asymmetric cryptosystems. (15 points)

9. Explain how a cluster is better suited for use as a web server than either a parallel machine or a big personal computer fully loaded with a lot of memory and disk space. (20 points)