Systems Qualifier Exam
Spring, 2005

Name :_____

SID: _____

Score : _____

1. Explain what are distributed operating systems (DOS), network operating systems, and middleware. And also discuss the main goal of each of them.

2. What is persistent and transient communication in distributed systems and what is synchronous and asynchronous communication in distributed systems. Then draw figures to describe the differences between persistent asynchronous communication and response-based transient synchronous communication.

3. Statically associating only a single thread with a lightweight process is not a good idea, why not? Having only a single lightweight process per process is also not a good idea, why not?

4. High-level name servers in DNS, that is, name servers implementing nodes in the DNS name space that are close to the root, generally do not support recursive name resolution. Can we expect much performance improvement if they did?

5. Explain how DNS can be used to implement a home-based approach to locating mobile hosts.

6. Many distributed algorithms require the use of a coordinating process. Discuss to what extent can such algorithms actually be considered distributed?

7. Explain two-phase locking in distributed transactions. Does two-phase locking guarantee deadlock free operation? Why or why not?

8. Describe a simple implementation of read-your-writes consistency for displaying Web pages that have just been updated.

9. For each of the following applications, do you think at-least-once semantics or at-most-once semantics is best? Explain. (a) reading and writing files from a file server; (b) compiling a program; (c) remote banking.

10. Does TMR generalize to five elements per group instead of three? If so, what properties does it have?

11. Name two advantages and two disadvantages of using centralized servers for key management.

12. In NFS, attributes are cached using a write-through cache coherence policy. Is it necessary to forward all attributes changes immediately?