O.S. Ph.D. Candidate Exam.

1. Describe the differences among short-term, medium-term, and long-term scheduling. (10%)

2. What is the purpose of paging the page tables?(10%)

3. Deadlock questions:
(a) List four necessary conditions for the deadlock.(4%)
(b) Is it possible to have a deadlock involving only one single process? Why?(3%)
(c) Why recovery from deadlock is made difficult? (3%)

4. What is thrashing and the cause of it? (5%) How to prevent and if occurring, eliminate it? (5%)

5. How many page faults occur for LRU and optimal algorithms for the following reference string, with four page frames? (10%)
1, 2, 3, 4, 5, 3, 4, 1, 6, 7, 8, 7, 8, 9, 7, 8, 9, 5, 4, 5, 4, 2

6. Explain the difference between internal and external fragmentation. (10%)

7. What are the various kinds of performance overheads associated with servicing an interrupt? (10%)

8. What are the advantages and disadvantages of writing an operating system in a high-level language, such as C? (10%)

9. How does the NTFS directory structure differ from the directory structure used in Unix operating systems? (10%)

10. Assume we have a demand-paged memory. The page table is held in registers. It takes 8 milliseconds to service a page fault if an empty page is available or the replaced page is not modified and 20 milliseconds if the replaced page is modified. Memory access time is 100 nanoseconds. Assume that the page to be replaced is modified 70 percent of the time. What is the maximum acceptable page-fault rate for an effective access time of no more than 200 nanoseconds? (10%)