

CSCI-GA.2250-001
Final Exam (December 20th, 2011)
Duration: 90 minutes

Last Name: _____ **First Name:** _____
ID#: _____

Notes:

- If you perceive any ambiguity in any of the questions, state your assumptions clearly
 - Questions vary in difficulty; it is strongly recommended that you do not spend too much time on any one question.
 - This exam is open book/notes.
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1. (5 points) Circle the correct answer among the choices given. If you circle more than one answer, you will lose the grade of the corresponding question.

- (A) For the following context switches, which one is the slowest?
1. user-level threads of the same process
 2. kernel-level threads of the same process
 3. context switch from a process to another process
 4. They all have the same speed.
- (B) In a computer system with a single CPU and we do not know the runtime of each process. Which scheduling algorithm will you use?
1. First-Come First-Served
 2. Shortest Job First
 3. Shortest Remaining Time Next
 3. They are all the same.
- (C) Suppose an instruction of 4 bytes length loads 4 consecutive bytes from memory and saves them in a register. What is the maximum number of page faults that this can cause?
- 2 3 4 5 6
- (D) If you want to use a non-preemptive algorithm that results in the shortest average waiting time, and you know that all processes are available simultaneously, which one will you use?
1. First-Come First-Served
 2. Shortest Job First
 3. Shortest Remaining Time Next
 4. Round-Robin
- (E) When a system contains a TLB, which of the following page table structure is better?
1. single-level
 2. two-level
 3. three-level
 4. Will not make a difference

2. [4 points] In just 1-2 sentences explain when using DMA is beneficial and when it is not.

3. [4 points] Suppose you can only use test and set lock (TSL) or enabling/disabling interrupts for dealing with mutual exclusion. In one sentence say why would you prefer TSL over enabling/disabling interrupts. In another sentence say why would you prefer enabling/disabling interrupts over TSL.

4. [3 points] Suppose a virtual address is broken into four fields, a, b, c, and d. The first three are used for a three level page table system. The fourth field, d, is the offset. Which field(s) determine the number of pages in the virtual address? Explain.

5. [4 points] List one advantage and one disadvantage of using a large block size for a file.