

COSC 4330	FIRST MIDTERM	FEBRUARY 6, 2002
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This exam is **closed book**. You can have **one** page of notes.

1. Answer in **one sentence** to each of the following questions: (5×5 points)
 - (a) What is the purpose of **timer interrupts**?
 - (b) Why is **memory protection** never implemented in software?
 - (c) What is the difference between a **process** and a **program**?
 - (d) Give one example of a computer application with **hard deadlines**?
 - (e) What is the major disadvantage of **delaying disk writes**?
2. Running a rogue user program on a Unix system may erase some or all of the files of the user running the program but is not likely to ruin the whole file system. Would this be still true if the program was running on most versions of Windows? (5 points) Explain why. (5 points)
3. One can reasonably expect to have 4 GigaHertz CPUs two years from now. What will be the access time of the fastest registers on that CPU? (5 points)?

The access times for these registers will be _____ nanoseconds.

4. Contrast the respective advantages and disadvantages of **microkernels** and **monolithic kernels**. (20 points)
5. What is the difference between **client/server** and **peer-to-peer** architectures for distributed systems? (10 points)
6. Explain how multiprogramming can improve the performance of a **batch system**. (10 points)
7. A process waits for the CPU then runs for 100 ms before being interrupted by a timer interrupt. After waiting a while, it then regains the CPU and issues a system call. Enumerate the five states **visited or revisited** by that process in the order they are visited or revisited. (5×4points)

The five states visited or revisited by the process are

- (a) _____ state
- (b) _____ state
- (c) _____ state
- (d) _____ state
- (e) _____ state