CSI 4337 **Exam #3 (final)** **Dec 12, 2005 Eight Pages**

Name_____

All questions are worth 10 points. Maximum score: 100.

1. Is the following system in a safe state? If so show the "safe sequence" otherwise, list the processes that cannot be added to the safe sequence. If P4 makes a request of (0,2,1,1) and we grant the request, will the system be in a safe state?

	Has				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P0	2	0	0	0	2	3	1	1	1	2	1	1
P1	0	0	0	1	1	2	2	1				
P2	1	0	1	1	1	2	2	2				
P3	0	1	1	1	3	1	1	1				
P4	0	3	2	0	0	3	2	3				

2. There are five conditions necessary for deadlocks to occur. List them and give a one or two-line explanation of each.

3. Explain the ext2 file system, and how it differs from the UNIX file system. In your discussion, explain the nature and purpose of an INODE.

4. Given the following five processes and associated burst times, give the GANTT chart for the scheduling algorithms First Come First Served (FCFS), Shortest Job First (SJF), and Round Robin with a quantum of 5. Give the average wait time for each algorithm

Process Number	Burst Time
0	12
1	3
2	7
3	8
4	1

5. In the NTFS file system, what structure replaces the INODE table in the ext2 file system? This structure differs from the INODE table in several ways. Give at least three important differences between the two.

6. Give an example of a file system that is organized as a) multiple contiguous blocks, b) linked list, c) indexed.

7. What is Belady's Anomaly? Explain thoroughly.

8. What property of stack algorithms guarantees that Belady's Anomaly will not occur?

9. Given the following reference string, show how many page faults would occur for the three algorithms FIFO, LRU, and OPT. Assume that you have three page frames.

   1,2,3,1,2,4,1,3,4,5,1,2,1,5,4

10. Explain how a network service such as HTTP or Secure Shell is implemented in an operating system such as LINUX.