CS 4760	**Operating Systems**	**Test 2**
Name:	Fall 2014	Max Pts: 45

Important: This is an open book test. You can use any books, notes, or paper but no electronic device. *Do not log into the computer during the test, or use any electronic or communications device. Your cell phones must be on silent mode*. Any other device with an ON-OFF switch should have its switch in the OFF position. Any calculations and rough work can be done on the back side of the test pages. You will lose five points for not writing your name.

1. [6 pt] The only way to communicate with peripheral devices is through the kernel. Why is it not advisable (or possible) to work with devices directly in the raw mode?

2. [6 pt] How do you synchronize the non-reentrant portions of the kernel in Linux? Will your solution be applicable in a uniprocessor system?

3. [6 pt] What is the purpose of `pidmap_array` in Linux? How many pages of memory are required to hold it?

4. [6 pt] One of the ways to prevent deadlocks was given as creating a total order on the resources and allocating resources in the order of enumeration. Show by an example why a partial order will not be sufficient to achieve the same.

5. [6 pt] What is the difference between static and dynamic linking? What is the advantage of each of them?

6. [15 pt] Assume you have the following jobs to execute with one processor:

Process	Burst time	Arrival time
p_0	3	0
p_1	3	5
p_2	9	7
p_3	3	10
p_4	8	10

Give the average wait time for this set of processes using the following algorithms. Specify the arbitration rule used for each algorithm, if needed.

(a) First in first out

(b) Shortest job next (non-preemptive)

(c) Shortest remaining time next (pre-emptive)

(d) Round robin, with a quantum of 8

(e) Round robin, with a quantum of 4 plus context switch time of 1