CS 4760	**Operating Systems**	Test 3
Name:	Spring 2009	Max Pts: 54

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. Switch off your cell phones*. Any calculations and rough work can be done on the back side of the test pages. If there is a syntax error in any program segment, just write it down and you will get full credit for the problem. You will lose five points for not writing your name.

1. [8 pt] What are the elements typically found in a page table. Give a brief definition of each of those elements.

2. [6 pt] During the discussion of disk controller, we noted the fact that the controller can handle more than one drive at a time. Since the data is transmitted with exclusive control of bus, how does the controller handle more than one device at a time?

3. [10 pt] Consider a 16-bit machine with a frame size of 2KB. Current free frame list is: 0x37, 0x33, 0x9F, 0x1D, 0x4C, 0x54, 0x24, 0x4B, 0x20, 0x43, 0x1D, and 0x47. You schedule a process that requires 8 frames. Show the resulting page table. Show the translation of logical address 0x1648 and 0xA617 into physical addresses using your table.

4. [6 pt] Why is the average search time to find a record in a file less for an indexed sequential file than for a sequential file?

5. [6 pt] One of the techniques to protect a file from unauthorized access is *security by obscurity*. If a user cannot tell the name of a file exactly, he cannot access it. How do we achieve this in a Unix-based system?

6. [18 pt] Consider a disk with 256 cylinders, indexed from 0 to 255, with 0 being the innermost and 255 being the outermost cylinder. The system receives disk requests on the following tracks in the specified order

22 94 35 27 210 96 153 27 82 79 91

The head is currently on cylinder 72, and is moving towards outer cylinder. Give the total number of tracks traversed for the given requests using each of the following algorithms.

(a) FCFS scheduling

(b) SSTF scheduling

(c) SCAN scheduling

(d) C-SCAN scheduling, servicing requests as head moves outwards

(e) LOOK scheduling

(f) C-LOOK scheduling, servicing requests as head moves outwards