CS 4760	**Operating Systems**	Test 3
Name:	Fall 2008	Max Pts: 62

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. [5 pt] When we discussed page table, we started with a simple address of frame as the only attribute for each page. Then, we started to add some bits to provide more information to improve the performance. Enumerate all of the bits we added to the page table and describe their purpose in one sentence for each bit.

2. [8 pt] Windows identifies file types by a three character extension. Unix treats each file as a stream of bytes but can tell the content-type by using the magic number. Give at least two advantages of each approach.

3. [15 pt] Consider the following page reference string:

1 8 0 7 0 2 5 9 7 1 8 1 9 6 1 8 9 6 2 1

The frames are initially empty. Give the number of page faults with the following page replacement algorithms, cinsidering five frames in the system:

(a) FIFO

(b) OPT

(c) LRU

(d) LFU

(e) Second chance

4. [10 pt] I have a 1TB disk with each block as 2KB. This disk uses UFS for file allocation. What is the maximum file size you can store on this device? Assume a 32-bit operating system.

5. [6 pt] What is the difference between block-oriented devices and stream-oriented devices? Give two examples of each.

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

   74 76 171 95 51 69 174 56 217 62 137

   The head is currently on cylinder 47, and is moving towards outer cylinder. The head requires a total of 128ms to move from innermost to outermost track. Give the time required to service 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