Midterm 1–February 24 Closed book section (64 points)

The exam is to be turned in at 2:50 pm. Work the closed book section first and turn it in before you consult your books and notes to work on the open book section. For the closed book section, write your answers on the exam itself. For the open book section, write your answers on separate pieces of paper.

University regulations require that you sign the following pledge on the first page of your turned-in exam.

I have neither received nor given any unauthorized aid on this exam.

Problem 1. (24 points–4 points each)

Give short definitions (one or two phrases or sentences) of the following terms.

critical region

delayed write

locking

path name

reference count

user mode

Problem 2. (16 points–4 points each)

Give a brief description of what the following UNIX system calls do at the user level. You don't need to describe the implementation!

```
chmod(filename, mode)
```

fork()

link(filename1, filename2)

pipe(fdptr) -don't worry about which end is which

Problem 3. (4 points)

What are the two different Unix operating systems often mentioned in class?

```
Problem 4. (4 points)
```

Suppose a C program starting with the following header:

main(argc, argv)
 int argc;
 char *argv[];

is compiled and the compiled code is stored in the file now. If the command:

```
% now is the time
is executed, what are the values of argc and the array elements of argv?
```

Problem 5. (4 points)

Suppose ${\tt P[0]}$ is a file descriptor that refers to the read end of a pipe. Under what circumstances will the system call

```
read(P[0], buff, buff_size)
```

return zero?

Problem 6. (4 points)

List the following six items in order of size (smallest to largest):

a. cylinder group	d. data block
b. track	e. cylinder
c. file system	f. disk

Problem 7. (4 points)

Pick a random *data* block of a file system. If the file system is *consistent*, what is the largest number of inodes that *could* point to that block?

Problem 8. (4 points)

Suppose the file /foo/onu has file access permissions 0666, *i.e.*, readable and writable to all users. Under what circumstances will the system call

open("/foo/onu", O_RDONLY)

return zero?