# Homework #1

**Your Name:** _____

**Your Email:** _____

**Due Date:** Thursday, October 9, 2014, Beginning of class

> *Please write your answers directly on this sheet.*
> *Hand in the hardcopy.*
> *Staple all pages together.*

**Textbook Reading Assignment**

   Pages 1-119 by Tuesday, October 7, 2014 (Chapter 1, Beginning of chapter 2)
   Pages 119-163 by Tuesday, October 14, 2014 (Rest of chapter 2)

1. What is "multiprogramming"?

_____

_____

_____

2. What does the "system call" machine instruction do? (In class, I refer to this as the "syscall" instruction; it is also often called the "trap" instruction.)

_____

_____

_____

3. What does MMU stand for?  What does it do?

_____

_____

_____

4. What does DMA stand for?  Describe this.

_____

_____

_____

5. Imagine that an operating system starts an I/O operation.  Describe "busy-waiting".

_____

_____

_____

6. Imagine that an operating system starts an I/O operation.  Assume that an interrupt occurs on completion of the I/O.  Describe what happens when the interrupt occurs and is processed.

_____

_____

_____

7. Briefly describe the following Unix  system calls
      pid = fork ()

      _____

s = execve (filename, ...)

exit (status)

pid = waitpid (pid, &statusLoc, ...)

8.  In a UNIX file system, every file has a unique number that describes it.  What is this number called?

9.  Each directory in UNIX is a file; what is in that file?

10.  The IBM operating system called VM/370 provided a number of "virtual machines."  What does this mean?

11.  Name and briefly describes the 3 possible states a process can be in at any moment.  (At least as discussed in the textbook; other models may have more complexity.)

_____

_____

_____

12. What is a "Process Control Block" and what info would be kept in it.

_____

_____

_____

13. What is a "thread"?

_____

_____

_____

14. By default, how many threads does a process usually have?

_____

15. What is a critical region?

_____

_____

_____

16. Are critical sections and critical regions the same or different?

17. In any solution to the problem of critical regions, four conditions should hold. What are they?

18. A semaphore is like a counter and will be implemented using an integer variable. Why is it not okay for the user of a semaphore to access the semaphore's count?