

## CSCI 350 Fall 2016 Practice Exam II

**DO NOT OPEN EXAM PACKET UNTIL INSTRUCTED TO DO SO**

**YOU MAY FILL IN INFORMATION ON THE FRONT NOW**

**PLEASE TURN OFF ALL ELECTRONIC DEVICES**

ID#:	
Last (Family) Name:	
Rest of Name:	
Room of Exam:	

- The real exam is closed book. You are allowed one (1) 8.5" x 11" handwritten note sheet
- You will have fifty (50) minutes to complete the real exam.
- Answer the questions only in the spaces provided on the question sheets.
- If you give multiple solutions to a problem without indicating which one you want graded, the grader may select one to grade.
- Your answers do not need to be complete, grammatically correct sentences.

Problem	Your Points	Points Possible
1		4
2		3
3		3
4		2
5		1
6		3
7		4
Total		20

1. We described how the operating system kernel mediates access to I/O devices for safety. Some newer I/O devices are *virtualizable* -- they permit safe access from user-level programs, such as a guest operating system running in a virtual machine. Explain how you might design the hardware and software to get this to work. (Hint: The device needs much of the same hardware support as the operating system kernel.)

2. Suppose you build a system using a staged architecture with some fixed number of threads operating in each stage. Assuming each stage is individually deadlock free, describe two ways to guarantee that your system as a whole cannot deadlock. Each way should eliminate a different one of the four necessary conditions for deadlock.



6.

a. What is a process?

b. How is a process different from a thread?

7. In UNIX, can `fork` return an error? Why or why not?

Note: Obviously, since this is the practice test, you could solve this by looking at the manual page for `fork`. What I want you to do here, though, is this about what the `fork` system call *does*. If you were designing this call, would you need to allow `fork` to return an error?