

1. Go through the steps that must take place in a context switch. Make sure that you give the conditions under which a context switch could actually occur. Give two scenarios, one that is the result of a program action, one that is not.
2. Define the term "System Call." Give a list of the various system calls that could be performed by a program.
3. Explain the concept of memory protection, and why it is needed.
4. What kinds of things get saved in a PCB? Why do I need a PCB in the first place?
5. Show how to protect a shared variable using the TestAndSet instruction.
6. Explain the concept of privileged instructions and explain why they are needed.
7. Show how to protect a shared variable using semaphores.
8. Explain the readers and writers problem, and the bounded buffer problem.
9. What are the three necessary conditions for a correct solution to the mutual exclusion problem?
10. How does a new process get created?
11. When your program is running, what is the OS doing?
12. Given the following processes and burst times, give a gantt chart for each, compute the average wait time, the average turn-around time, and the average response time for the three algorithms, shortest remaining time first, first come first served, and round robin with a quantum of 3.

Process	Burst Time	Arrival Time
P1	12	1
P2	2	2
P3	2	3
P4	7	7
P5	1	8

13. If the arrival times are all equal, which algorithm will minimize average wait time? Why?