

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. What are the three types of threading? How do they differ from one another.
6. When I use pthreads, what is the only way to switch from one thread to another?
7. In messaging, explain how a zero-capacity buffer system works. Contrast this with a buffered system.
8. Explain the difference between the fork and the clone system calls.
9. How does a new process get created?
10. When your program is running, what is the OS doing?
11. 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

12. Suppose the following two statements are executed simultaneously by two processes with no protection. The value of S is 10 before the statements are executed. What are the possible final values, and how can each occur?

shared int S = 10;

Process 1

...
S = S + 5;
...

Process 2

...
S = S + 10;
...