

These are *sample* questions for the midterm exam. They are not a list of the questions that will be on the exam. They are just to give you an idea of the difficulty and types of questions you will find on the exam. The exam may have True/False, multiple choice, short answer, and possibly code-writing questions. **Answers will not be provided.** They are in the book. Finding them is good preparation for the exam.

1. What is the difference between a trap and an interrupt?
2. What is multiprogramming?
3. How is the processor cache used to improve performance in a computer?
4. What is the difference between a system call and a system program?
5. What is the purpose of swapping?
6. What system calls have to be executed by a command interpreter or shell in order to start a new process on a UNIX system?
7. Name five criteria used for assessing the performance of a scheduling algorithm.
8. Draw a finite state diagram that illustrates the execution states of a process.
9. Provide two programming examples in which multithreading does not provide better performance than a single-threaded solution.
10. Using Amdahl's Law, calculate the speedup gain for an application that is 40 percent parallel with (a) eight processing cores and (b) sixteen processing cores.
11. Given the sequence of processes below, for each of FCFS, SJF, SRTF, RR with a quantum of 2, draw the Gantt chart and compute the average turnaround and waiting times.

Process ID	Arrival Time	Burst Time
P_0	0	8
P_1	2	5
P_2	3	3
P_3	7	4
P_4	7	4

12. What is one method of approximating the behavior of SJF?
13. Write the definition of the *test-and-set* instruction in software.
14. True or False: A nonpreemptive kernel is safe from race conditions on kernel data structures.
15. Give an example of a race condition.
16. What is a critical section?
17. What three conditions must a solution to the critical section problem satisfy?