

CSE 4501 Operating Systems

Chapter 3: Processes

Practice Exercises *(Will help to understand questions those may come in the quiz, mid and final examinations)*

1. Palm OS provides no means of concurrent processing. Discuss three major complications that concurrent processing adds to an operating system.
2. The Sun UltraSPARC processor has multiple register sets. Describe what happens when a context switch occurs if the new context is already loaded into one of the register sets. What happens if the new context is in memory rather than in a register set and all the register sets are in use?
3. When a process creates a new process using the `fork()` operation, what are shared between the parent process and the child process?
4. Describe the differences among short-term, medium-term, and long-term scheduling.
5. What is context-switch? Describe the actions taken by a kernel to context-switch between processes.
6. What are the benefits and the disadvantages of each of the following? Consider both the system level and the programmer level.
 - a) Synchronous and asynchronous communication
 - b) Automatic and explicit buffering
 - c) Fixed-sized and variable-sized messages
7. Write details about followings
 - a. Shared Memory
 - b. Message passing
8. What are the benefits and disadvantages of shared memory and message passing?
9. Definitions:
 - a. Zombie process
 - b. Orphan process
 - c. Independent process
 - d. Cooperating process
 - e. Direct communication
 - f. Indirect communication
 - g. Blocking send
 - h. Blocking receive
 - i. Non-blocking send
 - j. Non-blocking receive
 - k. Zero capacity Buffering
 - l. Bounded capacity Buffering
 - m. unbounded capacity Buffering
10. How processes communicate with each other via direct communications and indirect communications?
11. What are the benefits and disadvantages of direct communication and indirect communication?
12. Write down the properties of direct communication link and indirect communication link.

13. Write down the advantages of process cooperation.
14. Describe about resource sharing between parent and child processes. Compare among them.
15. What is Process Control Block (PCB)? Write down the components of a PCB.
16. Write a short note on process state with state diagram.
17. How a process is stored in the main memory while being executed? Describe with different parts in the memory block.
18. Programming related questions like output after a specific line, number of child processes, PID values, etc. will come in the examination.