

Guidelines for 530 Questions in the CS MS Comprehensive Exam

1. Explain the basic elements and functions of computer systems, including interrupt handling, memory hierarchy, multiprocessor/multicore organizations
2. Describe key functions of an operating system and OS architecture comparison (e.g., UNIX, Windows)
3. Explain the process/thread states and solve the problem of state transitions
4. Explain and write pseudocode for mutual exclusion, semaphores, monitors, and message passing
5. Solve the problem of deadlock prevention, deadlock avoidance, and deadlock detection, with the concepts of resource allocation graph and banker's algorithm
6. Solve the problem of partitioning-based memory assignment and the placement algorithms (e.g., best-fit, first-fit, next-fit)
7. Solve the problem of virtual memory-to-physical memory address translation and virtual memory page replacement (e.g., optimal, LRU, FIFO, Clock)
8. Solve the problem of process scheduling (e.g., FCFS, RR, SPN, SRT) and performance analysis (e.g., TAT)