

CECS 326-01 Chapter Exam 5 Study Guide

Exam 5 is scheduled on 11/30/2021. Exam questions are mostly objective that include multiple choice, and true or false. The exam covers Lecture Notes 4 - Deadlocks. It is important to understand, for each of the following terms, what it is, what it is for, and all relevant concepts related to it in operating systems.

- Examples of deadlock in a system
- Deadlock characterization – 4 necessary conditions for deadlock to occur
- Representation of system state: resource allocation graph
- Approaches for handling of deadlock
 - Deadlock prevention – Design system to ensure at least one of the necessary conditions for deadlock will not exist. May choose to deny either hold and wait or circular wait, how and typical outcome? Why can't the other two conditions be used?
 - Deadlock avoidance – Use a priori information on maximum resource claims for safe state checking in every resource allocation decision.
 - Safe-state checking algorithms:
 - System with single instance of every resource type: Resource-allocation graph algorithm
 - System with multiple instances of resource types: Banker's algorithm
 - Deadlock detection/recovery – Allow system to enter deadlock state. Recover when deadlock is detected. Need scheme to check for existence of deadlock and to recover.
 - Detection algorithms:
 - System with single instance of every resource type: Search for a cycle in the wait-for graph. Time complexity?
 - System with multiple instances of resource types: Graph reduction algorithm. Time complexity?
 - Schemes for deadlock recovery:
 - Abort process(es)
 - Rollback, need check pointing