

1. What is deadlock? Describe and compare different deadlock prevention and detection techniques. Which one is commonly used and why?
 2. Compare between Immediate and Deferred database modification techniques in log based recovery.
 3. Discuss about two-phase commit protocol and different variants of it.
 4. Describe the three main architectures for parallel DBMSs. Explain why the shared-memory and shared-disk approaches suffer from interference. What can you say about the speed-up and scale-up of the shared-nothing architecture? Why is a shared-nothing architecture attractive for parallel database systems?
2. Describe the three main architectures for distributed DBMSs. In the Collaborating Servers architecture, when a transaction is submitted to the DBMS, briefly describe how its activities at various sites are coordinated.
3. What is a commit protocol and why is it required in a distributed database? Describe and compare Two-phase and Three-phase Commit. What is blocking and how does the Three-Phase protocol prevent it? Why is it none the less not used in practice?
4. Write notes on :
- a) Distributed Catalog Management
 - b) Phantom Deadlock
 - c) multiversion concurrency-control schemes
5. How to parallelize individual operations (Loading, Scanning, Sorting Joins) in a parallel database systems?
6. Discuss various lock management schemes in distributed databases.
7. Explain the concept of Distributed database deadlock. Discuss about the various distributed deadlock detection approaches.