

**IIIT-Allahabad**  
**IMDM Assignment Questions**  
**Assignment 2: Concurrency Control Mechanisms**

1. The message and time complexity of Distributed Two Phase commit is better than Linear Two Phase Commit. Why?
2. Explain the ACID properties of a transaction and discuss which ACID property can be safely removed without affecting the consistency preserving property of the execution of concurrent transactions.
3. Prove that if two-phase policy is violated then it may not be possible to serialize the execution of concurrent transactions.
4. Consider developing your own concurrency control mechanism based on dynamic attributes of transactions. (Hint: Try to integrate multiple locking-based concurrency control mechanisms.)
5. Consider Bayou approach for database manipulation in weak connectivity environment, the system (see the diagram below) is built on peer to peer architecture with a number of replicated servers weakly connected to each other. This system provides dependency checks for automatic conflict detection & merges procedures for resolution. Write the pseudo code for Dependency check and Merge procedure (handling conflicts) in Bayou write operation. Consider the example to schedule a meeting (date, time, duration) after checking dependency and also handling conflicts.

