**UNIT-IV**: Replica Management, Consistency Protocols, Fault Tolerance – Component Faults, System Failures, Use of Redundancy, Active Replication, Use of Primary Backup, Process Resilience, Distributed Commit.

**UNIT-V**: Architecture – On-Chip Memory, Bus-Based Multiprocessors, Ring-Based Multiprocessors, Switched Multiprocessors, Directories, Caching, Protocols – Dash Protocols, NUMA Multiprocessors, NUMA Algorithms, Page-based Distributed Shared Memory.