Unit I

Introduction to Database Management Systems : Purpose of Database Systems, Database-System Applications, Data Abstraction and Database System Structure.

Relational Model : Structure of relational databases, Domains, Relations, Relational algebra – fundamental operators and syntax, relational algebra queries, tuple relational calculus.

Entity-Relationship model : Basic Concepts, Entity Set, Relationship Sets and Weak Entity Sets, Mapping Cardinalities, Keys, E-R diagrams, Design Issues, Extended E-R Features, Converting E-R & EER diagram into tables..

Unit II

Basic concepts, CODD's Rules,

Relational Integrity : Domain, Referential Integrities, Enterprise Constraints.

Database Design : Features of Good Relational Designs, Normalization, Atomic Domains and First Normal Form, Decomposition using Functional Dependencies, Algorithms for Decomposition, 2NF, 3NF, 4NF and BCNF..

Unit III

DDL, DML, DCL, Structure : Creation, Alteration, Defining constraints – Primary key, Foreign key, Unique key, Not null, Check, IN operator.

Functions : Aggregate Functions, Built-in Functions – Numeric, Date, String Functions. Set operations, sub-queries, correlated subqueries, Use of group by, having, order by, join and its types, Exist, Any, All, view and its types.

Transaction control commands : Commit, Rollback, Save-point PL/SQL Concepts: Cursors, Stored Procedures, Stored Function, Database Triggers.

Unit IV

Basic concepts of a Transaction, Transaction Management, Properties of Transactions, Concept of Schedule, Serial Schedule, Serializability : Conflict and View, Cascaded Aborts, Recoverable and Non-recoverable Schedules, **Concurrency Control :** Need, Locking Methods, Deadlock handling and Time-stamp based Protocols.

Unit VI

Distributed Databases : Distributed Database Management System, Factors Encouraging DDBMS, Advantages of Distributed Databases, Types of Distributed Databases, Architecture of Distributed Databases, Distributed Database Design, Distributed Data Storage, and Distributed Transaction: Basics, Failure modes, Commit Protocols, Concurrency Control in Distributed Database.

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