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3BCA3

DATABASE MANAGEMENT SYSTEM

Unit-I

DBMS Concepts and Architecture

- Operational data
- Purpose of database system
- Views of Data
- Data Models : Relational, Network, Hierarchical
- Instances & Schemes, Data Dictionary
- Types of Database languages : DDL, DML
- Structure of a DBMS
- Advantages & Disadvantages of a DBMS

Database Design

- 3-level Architecture Proposal : External, Conceptual & Internal Levels.
- Entity Relationship Model as a tool of conceptual design : Entities & Entity Set, Relationship & Relationship Set, Attributes, Mapping Constraints, Keys
- Entity-Relationship diagram (E-R diagram) : Strong & Weak entities, Generalisation, Specialisation, Aggregation, Reducing E-R diagram to tables.

Unit-II**Relational Data Model**

- Set theory concepts and fundamentals : Relations, Domain, Attributes, Tuple
- Concept of keys : Candidate key, Primary key, Alternate key, Super key, Foreign key
- Fundamental integrity rules : Entity integrity, Referential integrity, Extension & Intension
- Relational Algebra : Select, Project, Cross product, Different types of joins i.e. theta join , equi join, natural join, outer join, Set operations
- Structured Query Language (SQL)
- Codd's rules.

Unit-III**Relational Database Design**

- Functional Dependencies, Good & Bad Decomposition
- Anomalies in a database : A consequences of bad design, Universal Relation
- Normalisation : First, Second, Third & BCNF Normal Forms
- Multivalued Dependency, Join Dependency & Fourth and Fifth Normal Form

Unit-IV**Indexing & Hashing**

- Basic Concepts,
- Indexing : B+ -tree Index Files, B -tree Index Files
- Hashing : Static hash functions, Dynamic Hash Functions
- Index Definition in SQL : Multiple Key Access

Unit-V**Recovery System**

- Failure Classification
- The Storage Hierarchy
- Transaction Model
- Log Based Recovery
- Buffer Management
- Shadow Paging

Text & Reference Books

- **Database System Concepts** by Henry F. Korth & Abraham Silberschatz
- **An Introduction to Database System** by Bipin C. Desai
- **An Introduction to database System** by C. J. Date