

**INDEX****UNIT I**

**Syllabus :** Introduction to Database Management Systems, Purpose of Database Systems, Database-System Applications, View of Data, Database Languages, Database System Structure, Data Models, Database Design and ER Model: Entity, Attributes, Relationships, Constraints, Keys, Design Process, Entity Relationship Model, ER Diagram, Design Issues, Extended E-R Features, converting E-R & EER diagram into tables..

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## UNIT II

**Syllabus : SQL :** Characteristics and advantages, SQL Data Types and Literals, DDL, DML, DCL, TCL, SQL Operators, Tables: Creating, Modifying, Deleting, Views: Creating, Dropping, Updating using Views, Indexes, SQL DML Queries: SELECT Query and clauses, Set Operations, Predicates and Joins, Set membership, Tuple Variables, Set comparison, Ordering of Tuples, Aggregate Functions, Nested Queries, Database Modification using SQL Insert, Update and Delete Queries.

**PL/SQL:** Concept of Stored Procedures & Functions, Cursors, Triggers, Assertions, roles and privileges, Embedded SQL, Dynamic SQL.

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### **UNIT III**

**Syllabus** : Relational Model : Basic concepts, Attributes and Domains, 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, BCNF, Modeling Temporal Data.

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#### UNIT IV

**Syllabus** : Basic concept 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, Deadlocks, Time-stamping Methods, Recovery methods : Shadow-Paging and Log-Based Recovery, Checkpoints, Query Processing, Query Optimization, Performance Tuning.

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### UNIT V

**Syllabus** : Introduction to Distributed Database System, Advantages, Disadvantages, CAP Theorem.

**Types of Data** : Structured, Unstructured Data and Semi-Structured Data. **NoSQL Database** : Introduction, Need, Features. Types of NoSQL Databases: Key-value store, document store, graph, wide column stores, BASE Properties, Data Consistency model, ACID Vs BASE, Comparative study of RDBMS and NoSQL.

**MongoDB (with syntax and usage)** : CRUD Operations, Indexing, Aggregation, MapReduce, Replication, Sharding

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### UNIT VI

**Syllabus : Emerging Databases :** Active and Deductive Databases, Main Memory Databases, Semantic Databases.

**Complex Data Types :** Semi-Structured Data, Features of Semi-Structured Data Models. **Nested Data Types :** JSON, XML.

**Object Orientation :** Object-Relational Database System, Table Inheritance, Object-Relational Mapping. **Spatial Data :** Geographic Data, Geometric Data.

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