Unit I

Introduction, Distributed DBMS Architecture, Data Fragmentation,
Replication and Allocation Techniques for Distributed Database Design.

Unit II

Distributed Transaction Management : Definition, properties, types, architecture

Distributed Query Processing : Characterization of Query Processors, Layers/ phases of query processing.

Distributed Concurrency Control : Taxonomy, Locking based, Basic TO algorithm,

Recovery in Distributed Databases : Failures in distributed database, 2PC and 3PC protocol.

Unit III

XML Databases: Document Type Definition, XML Schema, Querying and Transformation: XPath and XQuery.

Basic JSON syntax, (Java Script Object Notation),JSON data types, Stringifying and parsing the JSON for sending & receiving, JSON Object retrieval using key-value pair and JQuery, XML Vs JSON

Unit IV

NoSQL database concepts: NoSQL data modeling, Benefits of NoSQL, comparison between SQL and NoSQL database system.

Replication and sharding, Distribution Models Consistency in distributed data, CAP theorem, Notion of ACID Vs BASE, handling Transactions, consistency and eventual consistency

Types of NoSQL databases: Key-value data store, Document database and Column Family Data store, Comparison of NoSQL databases w.r.t CAP theorem and ACID properties.

Unit V

NoSQL using MongoDB: Introduction to MongoDB Shell, Running the MongoDB shell, MongoDB client, Basic operations with MongoDB shell, Basic Data Types, Arrays, Embedded Documents

Querying MongoDB using find() functions, advanced queries using logical operators and sorting, simple aggregate functions, saving and updating document.

MongoDB Distributed environment: Concepts of replication and horizonal scaling through sharding in MongoDB

Unit VI

Temporal database : Concepts, time representation, time dimension, incorporating time in relational databases.

Graph Database: Introduction, Features, Transactions, consistency, Availability, Querying, Case Study Neo4J

Spatial database: Introduction, data types, models, operators and queries

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