CS22231: DATABASE MANAGEMENT SYSTEM

Unit.No	Unit Name	Resource		Topics
1	Introduction to Database Management Systems		1	Advantages of a DBMS over file-processing Systems, Database-System purpose and applications
			2	Levels of Database Systems, Database Languages
			3	Data Models, Components of a DBMS and overall structure of a DBMS
			4	, Database Design and ER Model: Entity, Attributes, Relationships, Constraints, types of Keys,
			5	Entity Relationship Model, ER Diagram, Design Issues, Extended E-R Features,
			6	EER diagram into tables.
2	**Relational Algebra, SQL and PL/SQL**		1	Introduction to Relational Algebra, SQL: Characteristics and advantages, SQL Data Types and Literals,
			2	DDL, DML, DCL, TCL, SQL Operators, Tables: Creating, Modifying, Deleting, Views: Creating, Dropping, Updating using Views, Indexes,
			3	SQL DML Queries: SELECT Query and clauses, Set Operations, Predicates and Joins, Set membership,
			4	Tuple Variables, Set comparison, Ordering of Tuples, Aggregate Functions, Nested Queries,
			5	Database Modification using SQL Insert, Update and Delete Queries.
			6	PL/SQL: Concept of Stored Procedures and Functions, cursors and triggers

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3	**Advances in Databases and Big Data**		1	Introduction to NoSQL, Structured verses Unstructured data
			2	Different NoSQL Data Models
			3	NoSQL using MongoDB
			4	CAP theorem
			5	BASE Properties
			6	Comparative study of SQL and NoSQL
4	**Relational Database Design**		1	Relational Model: Basic concepts, Attributes and Domains
			2	CODD's Rules, Functional Dependencies
			3	Basic concepts, closure of set of functional dependencies
			4	closure of attribute set, canonical cover, Decomposition: lossless join decomposition and dependency preservation,
			5	The Process of normalization, 1NF, 2NF
			6	3NF,BCNF, 4NF, 5NF.
5	**Database Transactions and Query Processing**		1	Basic concept of a Transaction, Transaction Management, Properties of Transactions
			2	Concept of Schedule, Serial Schedule, Serializability: Conflict and View, Testing conflict and view serializability
			3	Recoverable and Non-recoverable Schedules
			4	Concurrency Control: Need, Locking Methods, Deadlocks

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			5	Timestamping Methods, Different Crash Recovery methods such as ShadowPaging
			6	Log-Based Recovery: Deferred and Immediate, Checkpoints, Introduction to Query Processing and Query Optimization
6	**Database architecture**		1	Introduction to Database Architectures: Parallel Databases
			2	Speedup and Scale up, Architectures of Parallel Databases
			3	. Distributed Databases: Architecture of Distributed Databases, Distributed Database Design, Distributed Data Storage,
			4	Distributed Transaction: Basics, Failure modes
			5	Commit Protocols
			6	Concurrency Control in Distributed Database