DBMS

Contents	Lecture No.
Why database, characteristics of data in database, DBMS, advantages of DBMS, file-oriented approach versus Database-oriented approach to Data Management, disadvantages of file-oriented approach.	(1)
Database administrator roles, different kinds of DBMS users, ANSI/SPARC 3-level architecture; conceptual model, logical model, physical model, data independence.	(2-3)
Entity-relationship model as a tool for conceptual design-entities attributes and relationships: ER diagram strong and weak entities.	(4-6)
Generalization: Specialization, Categorization, converting an E-R model into relational schema.	(7)
A brief overview of relational model. Definition of relation, properties of relational model (codd's 12 rules or equivalent). Concept of keys: candidate key, primary key, alternate key, foreign key, fundamental integrity rules: entity integrity, referential integrity.	(8-9)
Normalization concepts in relational model, normal forms (1NF, 2NF, 3NF) BCNF, 4NF, 5NF, functional dependencies, case study.	(10-12)
Relational algebra: Select, Project, Cross product, different types of joins (theta Join, equi join, natural join, outer join), set operations: union, intersection, difference, Cartesian product, division.	(13-14)
Simple and complex queries using relational algebra.	(15)
Tuple relational calculus, domain relational calculus.	(16)
Types of SQL commands. SQL operators & their precedence.	(17-18)
History of SQL, characteristics & advantages of SQL. SQL in action SQL data types & stands SQL constructs: (select-from-where), SQL constructs: group by ---having----order by, Nested queries, join, interaction, union, minor.	(19-22)
Correlated nested queries, insert, delete, update.	(23-24)
Tables, views indexes.	(25-26)
Embedded SQL	(27-28)
Database backups why plan backups? H/W protection & redundancy. Importance of backups causes of failures, Data storage.	(29-30)
Introduction to concurrency database recovery: Recovery concepts and terminology. Recovery facilities. Recovery techniques, detached transaction action	(31-32)
Database security & Integrity: Types of integrity constraints. Restrictions on integrity constraints. Data security risks. Data security requirements dimension of security.	(33-34)

Complex user management requirements protecting data with in the database. Granting & regarding privileges and rates. System viability factors.	(35-36)
Authenticating uses to the database.	(37)
Designing development of database applications on commercial RDBMS platforms.	(38-39)
Review	(40)