

Vidyalankar

S.E. Sem. IV [CMPN]
Database Management System

SYLLABUS

Time : 3 Hrs.

Theory : 100 Marks
Term Work : 25 Marks
Practical & Oral : 25 Marks

1. Introduction Database Concepts :

Introduction to data processing. Overview of file systems. Drawbacks of file system, Concept of a database. Comparison of Database systems and file system. Data abstraction, 3-Layered Architecture and data independence. Data models, Database languages. Database users and administrators. Database system structure.

2. Entity-Relationship Model :

Basic concepts; Constrains; Design issues, Entity-Relationship diagram; Strong-weak entity sets; Extended ER features; Mapping an ER schema to tables.

3. Relation Model :

Concept of a relation; Notion of primary and secondary keys; Structure relation database; The relation algebra and extended algebra operations; Formation of queries, Modification of database, Views.

4. SQL :

Background Basic structure; Set operations, Aggregate function. Null values; Nested queries. Views, complex queries, Database modification; DDL, embedded SQL, Stored procedures and functions.

5. Integrity and Security :

Domain Constraints, Referential integrity; Assertions, Triggers; Security and Authorization Authorization in SQL.

6. Relational – Database Design :

First Normal form, Pitfalls in relational – database design; Function dependencies. Armstrong Axioms; 2nd, 3rd, BCNF, and 4th normal form; Decomposition. Desirable properties of decomposition; Overall database design process.

7. File structure, Indexing and Hashing :

File organization, Organization of records in files. Data Dictionary storage; Basic Indexing concepts, Ordered Indices, B+ Tree and B Tree Index Files; Static Hashing, Dynamic hashing; Index Definition in SQL Multiple key access.

8. Transactions :

Transaction concept, Transaction states; Implementation of atomicity and durability; Concurrent Executions, Serializability, Recoverability; Implementation of isolation, Transaction definition in SQL.

9. Concurrency Control :

Lock-based protocols; Timestamp-based protocols; Validation-based protocols; Deadlock handing.

10. Recovery System :

Failure Classification, Storage structure; Recovery and atomicity; Log based recovery, Shadow paging; Recovering with concurrent transactions; Buffer Management.

References :

1. “Database System Concepts” (*Korth, Slberchatz, Sudarshan*) 5th Edition, McGraw – Hill.
2. “Database Systems Design, Implementation and Management” (*Peter Rob and Carlos Coronel*) Thomson Learning, 5th Edition.
3. “Fundamentals of Database Systems” (*Elmasri and Navathe*) Fourth Edition, PEARSON Education.
4. “Introduction to Database Systems” (*C. J. Date, A. Kannan*) Eighth Edition, Addison Wesley.
5. “Introduction to Database Management” (*Mark L. Gillenson, Paulraj Ponniah*) Wiley
6. “Database Management Systems” (*Raghu Ramkrishnan and Johannes, Gehrke*) TMH.
7. SQL and PL/SQL for Oracle 10g. Black Book (*Dr. P. S. Deshpande*) Dreamtech Press.

