

MCA 304 Database Management Systems

Module1 :(10Hours)

Introductory concepts of DBMS:

Introduction and applications of DBMS, Purpose of data base, Data, Independence, Database System architecture- levels, Mappings, Database, users and DBA

Relational Model:

Structure of relational databases, Domains, Relations, Relational algebra – fundamental operators and syntax, relational algebra queries, tuple relational calculus

Module2: (16 Hours)

Entity-Relationship model:

Basic concepts, Design process, constraints, Keys, Design issues, E-R diagrams, weak entity sets, extended E-R features – generalization, specialization, aggregation, reduction to E-R database schema.

Relational Database design:

Functional Dependency – definition, trivial and non-trivial FD, closure of FD set, closure of attributes, irreducible set of FD, Normalization – 1NF, 2NF, 3NF, Decomposition using FD- dependency preservation, BCNF, Multi- valued dependency, 4NF, Join dependency and 5NF.

Module3: (10 Hours)

Query Processing & Query Optimization:

Overview, measures of query cost, selection operation, sorting, join, evaluation of expressions, transformation of relational expressions, estimating statistics of expression results, evaluation plans, materialized views

Transaction Management:

Transaction concepts, properties of transactions, serializability of transactions, testing for serializability, System recovery, Two- Phase Commit protocol, Recovery and Atomicity, Log-based recovery, concurrent executions of transactions and related problems, Locking mechanism, solution to concurrency related problems, deadlock, , two-phase locking protocol, Isolation, Intent locking

Module 4 (10 Hours)

Security:

Introduction, Discretionary access control, Mandatory Access Control, Data Encryption

SQL Concepts:

Basics of SQL, DDL,DML,DCL, structure – creation, alteration, defining constraints – Primary key, foreign key, unique, not null, check, IN operator,Functions - aggregate functions, Built-in functions –numeric, date, string functions, set operations, sub-queries,

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correlated sub-queries, Use of group by, having, order by, join and its types, Exist, Any, All, view and its types. transaction control commands – Commit, Rollback, Savepoint
Distributed Data Base concepts.

PL/SQL Concepts:

Cursors, Stored Procedures, Stored Function, Database Triggers

Module 5 (6 Hours)

(As per choice of faculty)

(Portion covered can be tested through Internal evaluation only not to be included in University examination)

Text Books:

1. Abraham Silberschatz, Henry F. Korth and S. Sudarshan, "Database Systems Concepts", McGraw-Hill Education, New Delhi
2. RamezElmasri and Shamkant B. Navathe, "Fundamentals of Database Systems", Pearson Education Inc., New Delhi.

Reference Books:

1. Hector Garcia-Molina, Jeffret D. Ullman, JennifferWidom, "Database Systems: A Complete Book", Pearson Education Inc., New Delhi.
2. C. J. Date "An introduction to Database System", Pearson Education Inc., New Delhi.
3. Bipin Desai, "An introduction to Database System", Galgotia Publications.
4. Peter Rob & Carlos Coronel, "Database Systems: Design, Implementation, and Management", CENGAGE Learning India Pvt. Ltd., New Delhi.
5. Mark L. Gillenson, "Fundamentals of Database Management Systems", Wiley India Pvt. Ltd., New delhi.
6. Raghu Ramakrishnan, Johannes Gehrke, "Database Management Systems", McGraw-Hill Education (India), New Delhi.