Database Management System

Max Marks : 80 **Min Marks : 27**

Note : The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice. Only Simple calculators allowed not scientific calculator.

UNIT - I: Overview of Database Management
Data, Information and knowledge, Increasing use of data as a corporate resource, data processing verses data management, file oriented approach verses database oriented approach to data management; data independence, database administration roles, DBMS architecture, different kinds of DBMS users, importance of data dictionary, contents of data dictionary, types of database languages. Data models: network, hierarchical, relational.

UNIT - II: Relational Model & Relational Algebra
Entity-Relationship model as a tool for conceptual design-entities, attributes and relationships. ER diagrams; Concept of keys; Case studies of ER modeling Generalization; specialization and aggregation. Converting an ER model into relational schema. Extended ER features, Introduction to UML, Representation in UML diagram (Class Diagram etc.).

UNIT - III: Relational Database Design
Relational Algebra: select, project, cross product different types of joins (inner join, outer joins, self-join); set operations, Tuple relational calculus, Domain relational calculus, Simple and complex queries using relational algebra, stand alone and embedded query languages.

UNIT - IV: Structured Query Language (SQL)
Normalization concept in logical model; Pitfalls in database design, update anomalies: Functional dependencies, Join dependencies, Normal forms (1NF, 2NF, 3NF). Boyce Codd Normal form, Decomposition, Multi-Valued Dependencies, 4NF, 5NF. De-normalization.

UNIT - V: Query Processing and Security
Introduction to SQL constructs (SELECT…FROM, WHERE… GROUP BY… HAVING… ORDERBY….), INSERT, DELETE, UPDATE, DROP, VIEW definition and use, Temporary tables, Nested queries, and correlated nested queries, Integrity constraints: Not null, unique, check, primary key, foreign key, references, Inner and Outer Joins. **Query Processing:** Parsing, translation, optimization, evaluation and overview of Query Processing. **Protecting the Data Base:** Integrity, Security and Recovery. Domain Constraints, Referential Integrity, Assertion, Triggers, Security & Authorization in SQL.

BOOKS RECOMMENDED:

1. **Database System Concept**: *A. Silberschatz , H.F. Korth and S. Sudarshan*, TMH
2. **Fundamentals of Database Systems**: *Elmasri & Nawathe*, Pearson Education
3. **An Introduction to Database Systems**: *C. J. Date*, AWL Publishing Company
4. **SQL, PL/SQL**: *Ivan Bayross,* BPB Publication
5. **An Introduction to database systems**: *Bipin Desai*, Galgotia Publication.
6. **Database Management System**: *A. K. Majumdar & P. Bhattacharya*, TMH