



## DBMS Syllabus

- **Introductory concepts of DBMS**
  - Database
  - Database concept
  - Purpose of DBMS
  - Database components and Layer
  - Database Architecture
  - Database Model
  - E-R codd's Rule
  - Database users and DBA
  
- **RDBMS concept**
  - Relation
  - Keys
  - Relational Model
  - Structure of Relational Database
  - Relation Algebra syntax
  - Relational Algebra Queries
  
- **Entity-Relationship Model**
  - Basic concept
  - Design process
  - E-R diagram
  - different types of entities & relationships
  - weak entity set
  - Extended E-R features :
    - Generalization
    - Specialization
    - Aggregation
  - Constraints of IS-A relationship
  - Reduction of E-R database schema
  
- **Relational Database Design**
  - Function dependency
  - Dependency preservation
  - Lossless and lossy decomposition



- Multivalued dependency
- Normalization - 1NF, 2NF, 3NF, BCNF, 4NF, 5NF
  
- **SQL**
  - datatype
  - SQL Languages : DDL, DML, DCL, TCL, DQL
  - Create, Alter, Drop, Rename , Add column
  - Insert, Update, Delete Queries
  - distinct
  - order by
  - truncate and delete command difference
  - NULL value – IS NULL / IS NOT NULL
  - LIKE - LIKE with escape – NOT LIKE escape ""
  - alias name
  - and / or / not
  - not in / in operator
  - Arithmetic operator (+, -, \*, /, =, !=)
  - between operator
  - dual table
  - in-built function
    - String/Char Functions
    - Numeric/Math Functions
    - Date/Time Functions
    - Conversion Function
    - Analytic Function
    - Advanced Function
    - Grouping Function
  - Constraints with system table entry
  - group by
  - having by
  - Joins ( inner , left , right , full)
  - set operators (Union / union all / intersect / minus)
  - Any / all
  - case when
  - with clause
  - sub query / nested query and co-related sub-query
  - EXISTS / NOT EXISTS
  - View
  - Index
  - sequence
  - materialized view



- **Security**
  - DCL concept
  - Discretionary access control
  - Mandatory access control
  - Role-based access control
  - Grant / Revoke command
  - set role
  - create user
  
- **PL/SQL block**
  - PL/SQL block concept
  - PL/SQL conditional statements
    - Simple Loop with exit and continue
    - For loop
    - While loop
    - IF-ELSE condition
    - case-end case
    - Goto statement
  - Cursors
  - Procedure
  - Function
  - Package
  - Trigger
  - Exception handling
  - Array Type
  
- **Transaction Management**
  - TCL command
    - commit
    - savepoint
    - rollback
  - Transaction management
  - ACID property
  - Schedule
  - Serializability and testing of serializability
  - state of transactions
  - concurrent executions of transactions and related problems



- solution to concurrency related problems and concurrency control techniques
- Deadlock
- Deadlock detection
- Techniques to control deadlock
- Starvation
- Deadlock Recovery
- Database Recovery - Log based Recovery



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