Database Management System CAT -202

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UNIT-I

- **Introduction:** Overview of Database Management System: Various views of data Models, Schemes and Introduction to database Languages & Environments, Advantages of DBMS over file processing systems, Responsibility of Database Administrator. Three level architecture of Database Systems: Introduction to client/Server architecture.

UNIT-II

- **Data Models:** E-R Diagram (Entity Relationship), mapping Constraints, keys, Reduction of E-R diagram into tables. Network & Hierarchical Models,

- **File Organization:** Sequential File, index sequential files, direct files, Hashing, B-trees Index files, Inverted Lists., Relational Model.

- **Relational Algebra:** Meaning & various operations (set operations, select, project, join, division), Order

- **Relational calculus:** Domain, Tuple, Well Formed Formula, specification, quantifiers, Introduction to Query Language, QBE.

UNIT-III

• Integrity constrains, functional dependencies & Normalization, 1st, 2nd, 3rd and BCNF.

• Introduction to Distributed Data processing, Concurrency control: Transactions, Time stamping, Lock-based Protocols.

- Fundamentals of Database Systems by R.Elmasri and S.B.Navathe, 3rd Edition, Pearson Education, New Delhi.
- An Introduction to Database Systems by C.J. Date, 7th Edition, Pearson Education, New Delhi.
- A Guide to the SQL Standard, Data, C. and Darwen, H.3rd Edition, Reading, Addison-Wesley Publications, New Delhi.
- Introduction to Database Management system by Bipin Desai, Galgotia Pub, New Delhi.
- Database System Concepts by A. Silberschatz, H.F.Korth and S.Sudarshan, 3rd Edition, McGraw-Hill, International Edition.
- SQL / PL/SQL, by Ivan Bayross, BPB Publications.

•Introduction to Database approach

•Basic Terminology

•Characteristics of DBMS

•Historical Evolution

•Advantages of DBMS

•Additional Implications of DBMS approach

•Various Categories of DBMS Users

•Responsibilities of Database Administrators (DBA)

- Database is defined as a collection of related data.
- Where Data means Known facts that can be recorded and have an implicit   meaning.

- **Data**: Known facts that can be recorded and have an implicit meaning.

- **Database**: A collection of related data.

- **Database Management System (DBMS)**: A software package/ system to facilitate the creation and maintenance of a computerized database.

- **Database System**: The DBMS software together with the data itself. Sometimes, the applications are also included.

- **Mini-world**: Some part of the real world about which data is stored in a database. For example, student grades and transcripts at a university.

- Engineering
- Banking
- Business
- Commerce
- Electronics
- Medicine
- Library Science
- Education

- Example of a Database (The University Database)**Mini-world for the example**: Part of a UNIVERSITY environment.
- **Some mini-world *entities*:**
  - STUDENTs
  - COURSEs
  - SECTIONs (of COURSEs)
  - (academic) DEPARTMENTs
  - INSTRUCTORs

- **Some mini-world *relationships*:**
  - SECTIONs *are of* specific COURSEs
  - STUDENTs *take* SECTIONs
  - INSTRUCTORs *teach* SECTIONs
  - COURSEs *are offered by* DEPARTMENTs

- Controlling redundancy in data storage and in development and maintenance efforts.

- Sharing of data among multiple users.

- Restricting unauthorized access to data.

- Providing persistent storage for program Objects

- Providing Storage Structures for efficient Query Processing

- Providing backup and recovery services.
- Providing multiple interfaces to different classes of users.
- Representing complex relationships among data.
- Enforcing integrity constraints on the database.
- Drawing Inferences and Actions using rules

- Numeric and Textual Databases

- Multimedia Databases

- Geographic Information Systems (GIS)

- Data Warehouses

- Real-time and Active Databases

Thank You