Unit 3: Database Management System using LibreOffice Base
Chapter 8: Introduction to Database Management System

1. Database

A **Database** is a systematic collection of data that allows easy access, management, and updating.

1.1 Advantages of a Database

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1	Reduces data redundancy
2	Ensures data consistency
3	Improves data sharing
4	Enhances data security
5	Enables backup and recovery
6	Facilitates better decision making

2. Database Management System (DBMS)

A **DBMS** is a software that helps in storing, modifying, and retrieving data from a database.

2.1 Database Server

- A **Database Server** is a server that provides database services to other computer programs or computers.
- It processes requests and sends back the required information to the clients.

3. Data Models

A **Data Model** defines how data is connected, stored, and processed within the system.

Types of Data Models:

Model	Description
3.1 Hierarchical	Organizes data in a tree-like structure. Each child has only one parent.
3.2 Network	Each record can have multiple parent and child records, forming a graph.
3.3 Relational	Organizes data into tables (rows and columns) and establishes relationships using keys.

4. Elements of a Database

Element	Description
Table	Collection of related data organized in rows and columns.
Field	A column in a table that defines the data type.
Record	A row in a table, representing a single data item.
Query	A request to retrieve data from the database.
Form	User-friendly interface to enter or view data.
Report	Printed output of data in a formatted way.

5. Relational Database Management System (RDBMS)

An **RDBMS** stores data in the form of related tables and uses SQL for data operations.

5.1 Basic Terminologies of RDBMS

Term	Description
Table	A set of data elements (values) using a model of vertical columns and horizontal rows.
Field	Column in a table representing a specific attribute.
Record	A single row in a table.
Relation	A table with columns and rows.
Attribute	A field in a table.
Tuple	A row in a table.

6. Key Field

Keys are attributes that help in identifying records uniquely and maintaining relationships between tables.

Types of Keys:

Key Type	Description
6.1 Primary Key	Uniquely identifies each record in a table. Cannot be null.
6.2 Candidate Key	A field or group of fields that can qualify as a primary key.
6.3 Alternate Key	Candidate keys that are not selected as the primary key.
6.4 Composite Key	A primary key made up of two or more columns.
6.5 Foreign Key	A field in one table that refers to the **primary key** in another table. Used to establish a relationship.

7. Database Objects

Database objects are components used to store or manipulate data.

Object	Description
Table	Stores data in rows and columns.
Query	Used to search, filter, and retrieve specific data.
Form	User interface for data input and modification.
Report	Presents data in a printable, readable format.
Macro	A set of instructions to automate tasks in a database.