Chapter – 10 DBMS Concepts

Database

- A database may be defined as a collection of interrelated data stored together to serve multiple applications.

DBMS

- A DBMS (Database Management System) refers to a software that is responsible for storing, maintaining and utilizing databases. A database along with a DBMS is referred to as database system.

RELATIONAL DATABASE MODEL

- In this model, the data is organised into tables (i.e. rows and columns). These tables are called relations. A row in a table represents a relationship among a set of values.
- **Examples of common relational Database Management Systems** include Oracle database, Microsoft SQL Server etc.

RELATIONAL MODEL TERMINOLOGY

DOMAIN
- A domain is a pool of values from which the actual values appearing in a given column are drawn.

TUPLE
- The rows of tables are generally referred to as Tuples.

ATTRIBUTES
- The columns of tables (relations) are referred to as attributes.

DEGREE
- The number of attributes in a relation determines the degree of a relation.

CARDINALITY
- The number of tuples (rows) in a relation is called the cardinality of the relation.

VIEWS

- A view is a kind of table whose contents are taken from other tables depending upon a condition. View does not contain data of their own. The content of a view are derived from a table and that table is called BASE TABLE. These are the tables that actually contain data.

e.g.

Table : STUDENT

ROLL_NO	NAME	MARKS
2	A	45
3	B	54
4	C	56
6	D	78
8	E	99
9	F	82

To create a view from table STUDENT , the command is :

```
CREATE VIEW S1 AS          (name of the view)
SELECT * FROM STUDENT      (name of the base table)
WHERE ROLL_NO > 4;         (the condition)
```

This command create a view as follows:

ROLL_NO	NAME	MARKS
6	D	78
8	E	99
9	F	82

- Views greatly extend the control you have over your data. They are an excellent way to give people access to some but not all of the information in a table.

PRIMARY KEY

- It is a set of one or more attributes that can uniquely identify tuples within the relation. Every relation does have a primary key. In STUDENT table given above ROLL_NO is a primary key as it contains unique value for each row.
- The primary key is non redundant i.e. it does not have duplicate values in the same relation.

CANDIDATE KEY

- All attribute combinations inside a relation that can serve as primary key are Candidate Keys as they are candidates for the primary key position. In table STUDENT, ROLL_NO, NAME and MARKS are candidate keys.

ALTERNATE KEY

- A candidate key that is not the primary key is called an Alternate Key. In table STUDENT, NAME and MARKS are Alternate key.

FOREIGN KEY

- A foreign key is used to represent relationships between two tables. It is a non-key attribute, whose values are derived from the primary key of some other table.
- The table in which this non-key attribute i.e. foreign-key attribute exists, is called **a Foreign table or Detail table**, and the table that defines the Primary-key, which the foreign-key or detail-table refers to, is called Primary table or Master Table.

REFERENTIAL INTEGRITY

- It is s system of rules that a DBMS uses to ensure that relationships between records in related tables are valid, and users don't accidentally delete or change related data.
- Referential integrity in DBMS is ensured with the help of foreign key.

ADVANTAGES OF DATABASE SYSTEM

1. Reduced data redundancy (Duplication of data is known as Data Redundancy).
2. Controlled Data inconsistency.
3. Shared Data.
4. Secured Data
5. Integrated Data.