



# Database Management System

## Assignment - UNIT III

SEM – II

### 2 Marks Questions

#### 1. What is relation in DBMS? Explain with example.

**Ans** - A relation in a database management system (DBMS) refers to a table that organizes data into rows and columns. Each row represents a record, and each column represents an attribute or field.

**For example**, in a "Students" table, each row might represent a student, with columns like StudentID, Name, Age, and Grade.

#### 2. What are the properties of relation?

**Ans** - The properties of a relation in DBMS are:

- 1. Unique Column Names:** Each column in a relation must have a unique name.
- 2. Unique Column Values:** Each value in a column must be unique within that column.
- 3. Atomic Values:** Each cell in the table should hold a single, indivisible value.
- 4. Rows are Unique:** No two rows in a relation should be identical; each row must be unique.
- 5. Columns have a Defined Domain:** Each column should contain values from a specific data domain.

#### 3. What is domain in terms of DBMS?

**Ans** - A domain specifies the range of possible values for a column or attribute. It defines what kind of data can be stored in that column. For example, the domain of an "Age" column might be integers between 0 and 120.

#### 4. Explain degree of relation.

**Ans** - The degree of relation in DBMS just tells you how many columns a table has. If you have a table with columns for "ID", "Name", and "Age", the degree is 3 because there are three columns.

#### 5. Explain cardinality ratio in DBMS.

**Ans** - Cardinality ratio in DBMS tells us how many instances of one entity are related to another entity. For example, in a library database, it indicates how many books are written by one author.

## 10 Marks Questions

### 6. Explain following Term with suitable example

a. Primary Key b. Candidate Key c. Super Key

#### Ans - 1. Primary Key:

- Uniquely identifies each record in a table.
- **Example:** Employee ID in an Employee table.

#### 2. Candidate Key:

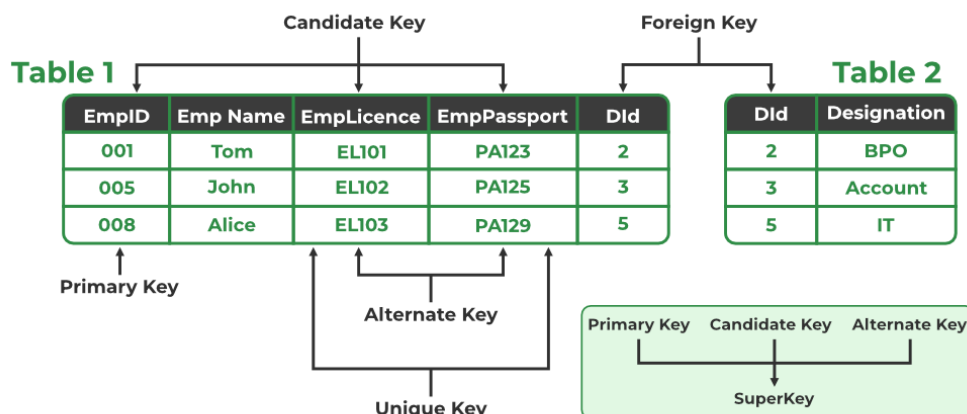
- Attributes that could potentially serve as a primary key.
- **Example:** Both Employee ID and Employee Passport could be candidate keys in an employee table.

#### 3. Super Key:

- A super key is a set of columns in a table that uniquely identifies each record.

**Example:** In an "Employee" table, the Employee ID alone can serve as a super key since it uniquely identifies each Employee.

#### DIAGRAM:



### 7. List and explain any five rules of mapping the ER and EER Model to the Relational

**Ans - 1. Entity to Table:** Entities become tables. Each entity's attributes become columns in its respective table.

**2. Attribute to Column:** Each attribute directly translates to a column in the corresponding table. Composite attributes are broken down into individual columns.

**3. Primary Key:** The primary key of an entity becomes the primary key of its corresponding table. It uniquely identifies each row in the table.

**4. Relationship to Foreign Key:** For relationships, the primary key of the related entity becomes a foreign key in the referring table. This maintains referential integrity.

**5. Many-to-Many:** Many-to-many relationships are handled by creating an associative table. This table contains foreign keys referencing the participating entities, resolving the many-to-many relationship into two one-to-many relationships.

### 8. List and explain unary and set operations.

**Ans - Unary Operations:**

- These operations work on a single relation.
- **Examples:**
  - **Selection:** Choosing specific rows based on a condition.
  - **Projection:** Selecting specific columns.
  - **Renaming:** Giving new names to attributes.
- They help in managing and refining data within a single table.

- **Set Operations:**

- These operations combine data from two relations.
- **Examples:**
  - **Union:** Combining all rows from both relations, removing duplicates.
  - **Intersection:** Selecting only rows common to both relations.
  - **Difference:** Selecting rows from one relation not found in the other.
- Set operations are useful for comparing and merging data between different tables.

### 9. Explain any five basic terms in relational model.

**Ans - 1. Table:**

- A table in the relational model represents a collection of related data organized into rows and columns.

**2. Row (Tuple or Record):**

- A row, also known as a tuple or record, represents a single instance of data in a table.

**3. Column (Attribute or Field):**

- A column, also known as an attribute or field, represents a specific type of data within a table.

#### 4. Primary Key:

- The primary key is a unique identifier for each row in a table, ensuring data integrity and uniqueness.

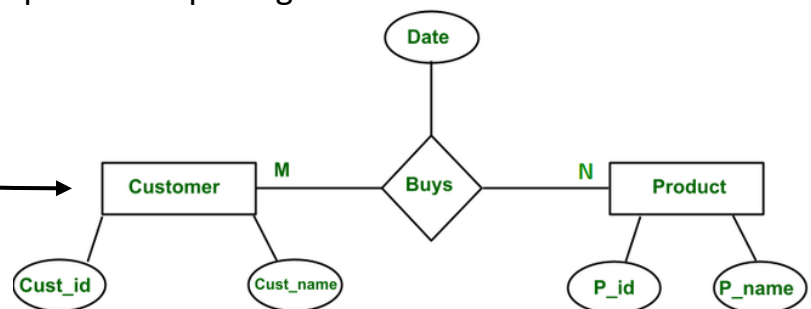
#### 5. Foreign Key:

- A foreign key is a column in one table that refers to the primary key in another table, establishing relationships between tables.

#### 10. Explain all cases for mapping of ER diagram to relation model for binary relationship with cardinality ratio m:m, 1:m, m:1, 1:1.

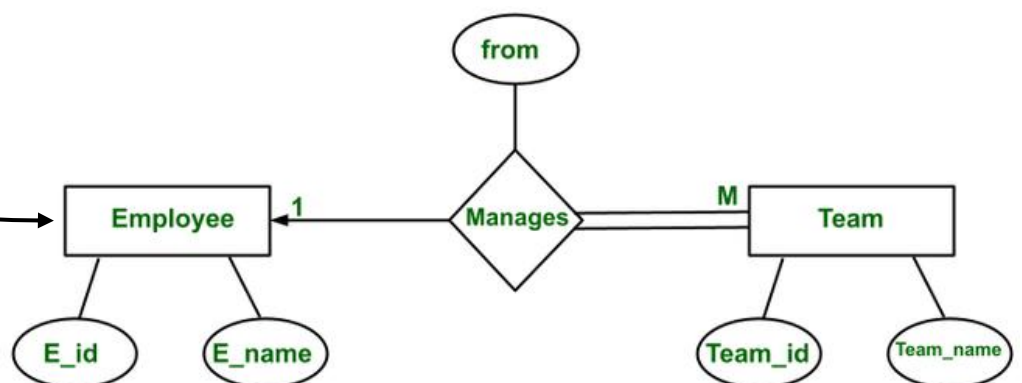
##### Ans - 1. Many-to-Many (m:m):

- Create a separate table for the relationship.
- Include foreign keys referencing the primary keys of both related entities.
- Each row in the new table represents a pairing between instances of the related entities.



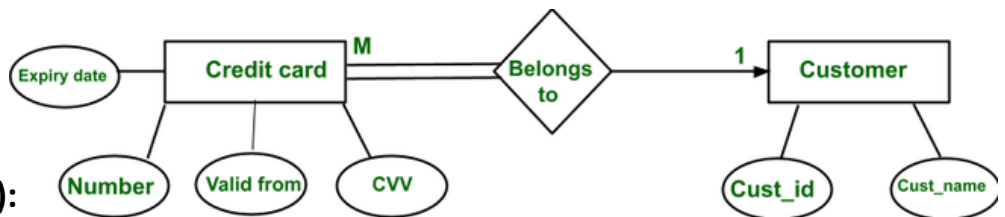
##### 2. One-to-Many (1:m):

- Add a foreign key column in the table representing the "many" side.
- The foreign key column references the primary key of the table representing the "one" side.
- Each row on the "many" side can be associated with only one row on the "one" side.



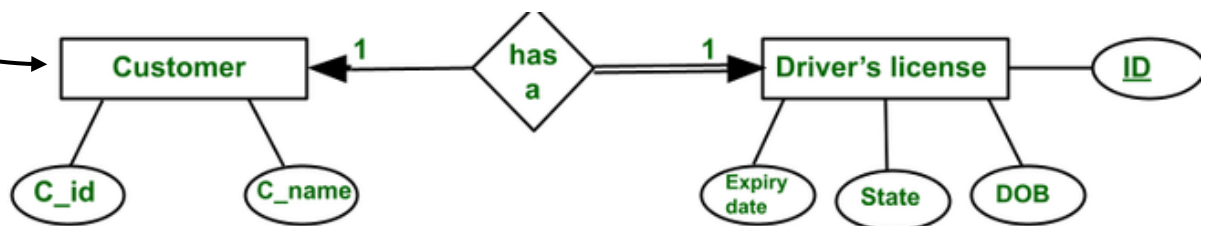
##### 3. Many-to-One (m:1):

- Similar to one-to-many but from the opposite perspective.
- Add a foreign key column in the table representing the "one" side.
- The foreign key column references the primary key of the table representing the "many" side.
- Each row on the "many" side can be associated with multiple rows on the "one" side.



#### 4. One-to-One (1:1):

- Include foreign key columns in either of the related tables.
- Each foreign key column references the primary key of the other table.
- Ensure each foreign key column is unique to enforce the one-to-one relationship.



**Disclaimer:** Answers are based on available data and calculations. We strive for accuracy but cannot guarantee it. Users should verify information independently. We are not responsible for any errors or outcomes.

**THANK YOU, CREATED BY SAURABH**

**ALL THE BEST**

"खुद पर भरोसा रखो, आगे बढ़ो ना डरो,  
सपनों को पाने का संकल्प करो, रास्ते में होगी मुश्किलें पर न थको।  
हारने की हो सोच, जीतने की हो आस,  
मन को हमेशा हो सकार, विश्वास रखो अपने पर और देखो अच्छे दिन का स्वागत कैसे करते हैं।"