**1> What do you understand By Database ?**

à Database is a collection of data in a format manner that can be easily accessed

à A database is a structured collection of data that is organized in a way that enables efficient storage, retrieval, and manipulation of that data.

à It is typically managed by a database management system (DBMS), which provides mechanisms for defining the structure of the data, querying the data, updating and modifying the data, and ensuring its security and integrity.

**2> What is Normalization ?**

à Normalization is a database design technique used to organize data.

à Primary goal of normalization is to reduce data duplication and minimize dependency among data elements.

à There are several forms ( 1NF , 2NF , 3NF , 4NF , 5NF ...)

**3> What is Difference between DBMS and RDBMS ?**

à DBMS (Database Management System) and RDBMS (Relational Database Management System) are both software systems designed to manage databases, but they have some key differences:

Feature DBMS RDBMS

Data Model Supports various models (e.g., hierarchical, network, relational) Strictly follows the relational model

Data

Integrity May not enforce strict data integrity constraints Enforces data integrity using constraints like primary keys and foreign keys

Query

Language May support simple query languages without full SQL support Typically supports SQL for querying and manipulation

Examples Microsoft Access, FoxPro, SQLite MySQL, PostgreSQL, Oracle Database

**4> What is 'MF Cod Rule' of RDBMS Systems?**

àEdgar F. Codd introduced twelve rules, known as Codd's Rules,

àThe twelve Codd's Rules are:

1. The Information Rule: All information in the database should be represented in one and only one way, namely as values in a table.

2. Guaranteed Access Rule: Each unique piece of data (atomic value) should be accessible by using a combination of table name, primary key value, and column name.

3. Systematic Treatment of Null Values: Null values should be supported and treated systematically, meaning they are distinct from zero or any other value.

4. Dynamic Online Catalog Based on the Relational Model: The database schema (structure) should be stored in the same relational database as regular data.

5. Comprehensive Data Sub-language Rule: The system must support a data manipulation language (DML) that is comprehensive in terms of data access, data definition, data manipulation, and transaction control.

6. View Updating Rule: All views that are theoretically updatable must be updatable by the system.

7. High-level Insert, Update, and Delete: The system must support high-level insert, update, and delete operations.

8. Physical Data Independence: Changes in the physical structure of the database (e.g., indexing methods) should not affect the logical structure (schema) and application programs.

9. Logical Data Independence: Changes in the logical structure of the database (e.g., adding new tables or columns) should not affect the existing application programs.

10. Integrity Independence: Integrity constraints (e.g., referential integrity) should be stored in the catalog, separately from application programs.

11. Distribution Independence: The distribution of portions of the database to various locations should not affect the application programs.

12. Non-subversion Rule: If a relational system has low-level (record-at-a-time) access, it must also support high-level (set-at-a-time) access.

**5> What do you understand By Data Redundancy?**

à data redundancy refers to the duplication of data within a data system.

àIt occurs when the same piece of data is stored in multiple times within the database.

àredundant data can lead to several issues : Increased storage requirements / Complexity in Maintenance

**6> What is DDL Interpreter?**

à DDL(Data Defination Language) is a component of DBMS responsible for processing and executing DDL statements.

à DDL statement used to define, modify and manage the structure and schema of database including table , inedexes ..

à ssome common DDL sataements supported by RDBMS:

à1. CREATE / 2. ALTER / 3. DROP / 4. TRUNCATE / 5. COMMENT

**7> What is DML complier in SQL ?**

à DML(Data Manipulation Language) compiler in SQL is a component of DBMS responsible for processing and executing DML statements.

à DML statements are used to quary / insert / update / delete

**8> What is SQL Key Constraints writing an Example of SQL Key Constraints.**

à In mysql, key constraints are used to enforce integrity rules on columns in table

à 1.) Primary Key :

primary key constraint uniquely each record in table and ensure that the key values are unique and not-null.

only one primary key constraint can be defined in table.

ex.

create table student(

student\_id int primary key ,

student\_name varchar(20),

age int );

à 2.) Unique key :

A unique key constraint ensures that the values in specified columns are unique across all rows in the table.

multiple unique key constraints can be defined per table.

ex.

create table products(

product\_id int ,

product\_name varchar(20),

unique(product\_id) )

à 3.) Foreign key :

A foreign key constraint create a relationship between two tables by enforcing referential integrity.

ex.

create table orders(

order\_id int primary key,

product\_id int,

foreign key (product\_id) references products(product\_id)

**9> What is save Point? How to create a save Point write a Query?**

àIn database systems, a savepoint is a point within a transaction that allows you to roll back part of the transaction

without rolling back the entire transaction.

à This can be useful when you want to make changes within a transaction but need the ability to revert some of those

changes while keeping others.

à Savepoints are especially useful in scenarios where you need to handle errors or unexpected situations

within a transaction without having to rollback the entire transaction.

**10> What is trigger and how to create a Trigger in SQL?**

à In SQL, a trigger is a special type of stored procedure that is automatically executed (or "triggered") in response to

certain events or actions occurring in a database. These events can include data manipulation operations

such as INSERT, UPDATE, DELETE, or even database schema changes.

à CREATE TRIGGER trigger\_name

{BEFORE | AFTER} {INSERT | UPDATE | DELETE}

ON table\_name

FOR EACH ROW

BEGIN

-- SQL statements to be executed

END;