**MODULE: 5 (Database)**

*Basics of Database*

1.What do you understand By Database:

DataBase is used to store data , manage data , analyze data.

2. What is Normalization?

Normalization in databases is the process of organizing data to reduce redundancy and improve data integrity. It involves dividing a database into smaller, related tables and defining relationships between them to eliminate duplicate data and ensure consistency.

3. What is Difference between DBMS and RDBMS?

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| --- | --- |
| RDBMS | DBMS |
| The data stored is in table format. | The data stored is in the file format. |
| Data in the form of a table are linked together. | No connection between data. |
| Support distributed database. | No support for distributed databases. |
| Data is stored in a large amount. | The data stored is a small quantity. |
| RDBMS supports multiple users. | DBMS supports a single user. |
| The software and hardware requirements are higher. | The software and hardware requirements are low. |
| Example: Oracle, SQL Server. | Example: XML, Microsoft Access. |

4. What is MF Cod Rule of RDBMS Systems?

Dr. Edgar F. Codd, the father of Relational Database Management Systems (RDBMS), introduced 12 rules (also called Codd’s Rules) in 1985 to define what qualifies as a true RDBMS. These rules ensure that a database follows relational principles.

Codd’s 12 Rules:

1. Information Rule

All data is stored in tables (rows and columns).

1. Guaranteed Access Rule

Each data item is uniquely accessible using a combination of table name, primary key, and column name.

1. Systematic Treatment of NULL Values

The system must support NULL values to represent missing or unknown data.

1. Dynamic Online Catalog (Metadata Rule)

A database must have a catalog (data dictionary) that can be queried using SQL.

1. Comprehensive Data Sublanguage Rule

The system must support at least one language (like SQL) that allows data definition, manipulation, and control.

1. View Updating Rule

Views (virtual tables) should be updatable if logically possible.

1. High-Level Insert, Update, and Delete

The system should support bulk operations using set-based commands (INSERT, UPDATE, DELETE).

1. Physical Data Independence

Changes in storage methods should not affect how data is accessed.

1. Logical Data Independence

Changes in table structure should not affect applications using the database.

1. Integrity Independence

Constraints like primary keys, foreign keys, and validation rules should be defined within the database and not at the application level.

1. Distribution Independence

The database should work the same way whether distributed across multiple locations or stored in one place.

1. Nonsubversion Rule

If a low-level access method exists, it must not bypass security or integrity rules.

5. What do you understand By Data Redundancy?

Data redundancy in a database refers to the unnecessary duplication of data across multiple tables or records. It occurs when the same piece of information is stored in more than one place, leading to increased storage usage, data inconsistency, and integrity issues.

6. What is DDL Interpreter?

A DDL (Data Definition Language) Interpreter is a component of a Database Management System (DBMS) that processes and executes DDL commands to define, modify, or delete database structures like tables, schemas, indexes, and constraints.

7. What is DML Compiler in SQL?

A DML (Data Manipulation Language) Compiler is a component of a DBMS that translates DML statements (such as INSERT, UPDATE, DELETE, and SELECT) into low-level query execution plans. It optimizes queries to improve performance and ensures efficient data manipulation.

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

SQL Key Constraints are rules applied to table columns to ensure data integrity and uniqueness. They help maintain data consistency, prevent duplicates, and establish relationships between tables.

Example :

CREATE TABLE Employees (

EmployeeID INT PRIMARY KEY,

Name VARCHAR(50) NOT NULL,

Email VARCHAR(100) UNIQUE,

Age INT CHECK (Age >= 18),

DepartmentID INT,

FOREIGN KEY (DepartmentID) REFERENCES Departments(DepartmentID)

);

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

A SAVEPOINT in SQL is a feature used in transaction management that allows you to set a point within a transaction. If an error occurs, you can ROLLBACK to the savepoint instead of rolling back the entire transaction.

Example:

SAVEPOINT savepoint\_name;

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

A Trigger in SQL is a stored procedure that is automatically executed in response to specific events on a table, such as INSERT, UPDATE, or DELETE operations. Triggers help in automating tasks, enforcing business rules, and maintaining data integrity.

Example :

CREATE TRIGGER trigger\_name

AFTER | BEFORE INSERT | UPDATE | DELETE

ON table\_name

FOR EACH ROW

BEGIN

END;