

**TOP 30**

# DBMS

**INTERVIEW QUESTION**



Created by- **TOPPERWORLD**

### Q 1. What is database normalization?

**Ans:** It is a process of analyzing the given relation schemas based on their functional dependencies and primary keys to achieve the following desirable properties:

1. Minimizing Redundancy
  2. Minimizing the Insertion, Deletion, And Update Anomalies
- Relation schemas that do not meet the properties are decomposed into smaller relation schemas that could meet desirable properties.

### Q 2. What is the difference between primary key and unique constraints?

**Ans:** The primary key cannot have NULL value, the unique constraints can have NULL values. There is only one primary key in a table, but there can be multiple unique constraints.

### Q 3. What are super, primary, candidate, and foreign keys?

**Ans:**

- A **super key** is a set of attributes of a relation schema upon which all attributes of the schema are functionally dependent. No two rows can have the same value of super key attributes.
- A **Candidate key** is a minimal superkey, i.e., no proper subset of Candidate key attributes can be a superkey.
- A **Primary Key** is one of the candidate keys. One of the candidate keys is selected as most important and becomes the primary key. There cannot be more than one primary key in a table..

- A **Foreign key** is a field (or collection of fields) in one table that uniquely identifies a row of another table.

#### Q 4. What are the advantages of DBMS over traditional file-based systems?

**Ans:** Database management systems were developed to handle the following difficulties of typical File-processing systems supported by conventional operating systems.

1. Data redundancy and inconsistency
2. Difficulty in accessing data
3. Data isolation – multiple files and formats
4. Integrity problems
5. Atomicity of updates
6. Concurrent access by multiple users
7. Security problems

#### Q 5. Why is the use of DBMS recommended? Explain by listing some of its major advantages?

**Ans :** Some of the major advantages of DBMS are as follows:

- **Controlled Redundancy:** DBMS supports a mechanism to control the redundancy of data inside the database by integrating all the data into a single database and as data is stored in only one place, the duplicity of data does not happen.
- **Data Sharing:** Sharing of data among multiple users simultaneously can also be done in DBMS as the same database will be shared among all the



users and by different application programs.

- **Backup and Recovery Facility:** DBMS minimizes the pain of creating the backup of data again and again by providing a feature of ‘backup and recovery’ which automatically creates the data backup and restores the data whenever required.
- **Enforcement of Integrity Constraints:** Integrity Constraints are very important to be enforced on the data so that the refined data after putting some constraints are stored in the database and this is followed by DBMS.
- **Independence of Data:** It simply means that you can change the structure of the data without affecting the structure of any of the application programs.

## Q 6. What are the differences between DDL, DML, and DCL in SQL?

**Ans:** Following are some details of three :

- **DDL** stands for Data Definition Language. SQL queries like CREATE, ALTER, DROP, TRUNCATE and RENAME come under this.
- **DML** stands for Data Manipulation Language. SQL queries like SELECT, INSERT, DELETE and UPDATE come under this.
- **DCL** stands for Data Control Language. SQL queries like GRANT and REVOKE come under this.

## Q 7. What is Identity?

**Ans:** Identity (or AutoNumber) is a column that automatically generates numeric values.

A start and increment value can be set, but most DBA leave these at 1.

A GUID column also generates numbers; the value of this cannot be controlled. Identity/GUID columns do not need to be indexed.

### Q 8. What is a Trigger?

**Ans :** A Trigger is a code associated with insert, update or delete operations. The code is executed automatically whenever the associated query is executed on a table. Triggers can be useful to maintain integrity in the database.



### Q 9. What is a transaction? What are ACID properties?

**Ans :** A Database Transaction is a set of database operations that must be treated as a whole, which means either all operations are executed or none of them. An example can be a bank transaction from one account to another account. Either both debit and credit operations must be executed or none of them. ACID (Atomicity, Consistency, Isolation, Durability) is a set of properties that guarantee that database transactions are processed reliably.

### Q 10. What are clustered and non-clustered Indexes?

**Ans:** Clustered indexes are the index according to which data is physically stored on a disk.

Therefore, only one clustered index can be created on a given database table.

Non-clustered indexes don't define the physical ordering of data, but logical ordering.

Typically, a tree is created whose leaf point to disk records. B-Tree or B+ tree are used for this purpose.

### Q 11. What is a Live Lock?

**Ans :** Livelock situation can be defined as when two or more processes continually repeat the same interaction in response to changes in the other processes without doing any useful work. These processes are not in the waiting state, and they are running concurrently. This is different from a deadlock because in a deadlock all processes are in the waiting state.

### Q 12. What is the purpose of normalization in DBMS?

**Ans :** Database normalization is the process of organizing the attributes of the database to reduce or eliminate data redundancy (having the same data but at different places).

**Purpose of normalization:**

- It is used to remove duplicate data and database anomalies from the relational table.
- Normalization helps to reduce redundancy and complexity by examining new data types used in the table.
- It is helpful to divide the large database table into smaller tables and link them using relationships.
- It avoids duplicate data or no repeating groups into a table.
- It reduces the chances for anomalies to occur in a database.



### Q 13. What is the main difference between UNION and UNION ALL?

**Ans:** UNION and UNION ALL are used to join the data from 2 or more tables but UNION removes duplicate rows and picks the rows which are distinct after combining the data from the tables whereas UNION ALL does not remove the duplicate rows, it just picks all the data from the tables.

### Q 14. What are the different levels of abstraction in the DBMS?

**Ans :**

- ◆ **Physical Level:** This is the lowest level of the data abstraction which states how the data is stored in the database.
- ◆ **Logical Level:** This is the next level of the data abstraction which states the type of the data and the relationship among the data that is stored in the database.
- ◆ **View Level:** This is the highest level in the data abstraction which shows/states only a part of the database.

### Q 15. What is a functional dependency in the DBMS?

**Ans:** This is basically a constraint that is useful in describing the relationship among the different attributes in a relation.

Example: If there is some relation 'R1' which has 2 attributes as Y and Z then the functional dependency among these 2 attributes can be shown as  $Y \rightarrow Z$  which states that Z is functionally dependent on Y.

### Q 16. What are the different types of relationships in the DBMS?

**Ans :** A Relationship in DBMS depicts an association between the tables.

Different types of relationships are:

**One-to-One:** This basically states that there should be a one-to-one relationship between the tables i.e. there should be one record in both the tables.

**One-to-Many:** This states that there can be many relationships for one i.e. a primary key table hold only one record which can have many, one, or none records in the related table.

**Many-to-Many:** This states that both the tables can be related to many other tables.

### Q 17. What is conceptual design in dbms?

**Ans :** Conceptual design is the first stage in the database design process. The goal at this stage is to design a database that is independent of database software and physical details.

The output of this process is a conceptual data model that describes the main data entities, attributes, relationships, and constraints of a given problem domain.

### Q 18. What is the main goal of RAID technology?

**Ans :** RAID stands for Redundant Array of Inexpensive (or sometimes “Independent”) Disks.

RAID is a method of combining several hard disk drives into one logical unit (two or more disks grouped together to appear as a single device to the host system).

RAID technology was developed to address the fault-tolerance and





performance limitations of conventional disk storage.

It can offer fault tolerance and higher throughput levels than a single hard drive or group of independent hard drives.

While arrays were once considered complex and relatively specialized storage solutions, today they are easy to use and essential for a broad spectrum of client/server applications.

### **Q 19. Difference between primary key and unique key and why one should use a unique key if it allows only one null ?**

**Ans :**

#### **Primary key:**

- Only one in a row(tuple).
- Never allows null value(only key field).
- Unique key identifier can not be null and must be unique.

#### **Unique Key:**

- Can be more than one unique key in one row.
- Unique key can have null values(only single null is allowed).
- It can be a candidate key.
- Unique key can be null and may not be unique.

### **Q 20.What is the difference between materialized and dynamic view?**

**Ans :**

#### **Materialized views**

- Disk-based and are updated periodically based upon the query definition.
- A materialized table is created or updated infrequently and it must be synchronized with its associated base tables.

## Dynamic views

- Virtual only and run the query definition each time they are accessed.
- A dynamic view may be created every time that a specific view is requested by the user.

## Q 21. What is embedded and dynamic SQL?

**Ans:**

### Static or Embedded SQL

SQL statements in an application that do not change at runtime and, therefore, can be hard-coded into the application.

### Dynamic SQL

SQL statements that are constructed at runtime; for example, the application may allow users to enter their own queries.

Dynamic SQL is a programming technique that enables you to build SQL statements dynamically at runtime.

You can create more general purpose, flexible applications by using dynamic SQL because the full text of a SQL statement may be unknown at compilation.

Static (embedded) SQL	Dynamic (interactive) SQL
In static SQL how database will be accessed is predetermined in the embedded SQL statement.	In dynamic SQL, how database will be accessed is determined at run time.
It is more swift and efficient.	It is less swift and efficient.

SQL statements are compiled at compile time.	SQL statements are compiled at run time.
Parsing, validation, optimization, and generation of application plan are done at compile time.	Parsing, validation, optimization, and generation of application plan are done at run time.
It is generally used for situations where data is distributed uniformly.	It is generally used for situations where data is distributed non-uniformly.
EXECUTE IMMEDIATE, EXECUTE and PREPARE statements are not used.	EXECUTE IMMEDIATE, EXECUTE and PREPARE statements are used.
It is less flexible.	It is more flexible.

## Q 22. What is the difference between CHAR and VARCHAR?

**Ans :**

- CHAR and VARCHAR differ in storage and retrieval.
- CHAR column length is fixed while VARCHAR length is variable.
- The maximum no. of characters CHAR data type can hold is 255 characters while VARCHAR can hold up to 4000 characters.
- CHAR is 50% faster than VARCHAR.
- CHAR uses static memory allocation while VARCHAR uses dynamic memory allocation.



**Q 23. There is a table where only one row is fully repeated. Write a Query to find the Repeated row**

Name	Section
abc	CS1
bcd	CS2
abc	CS1

**Ans :** In the above table, we can find duplicate row using below query.

```
SELECT name, section FROM tbl
GROUP BY name, section
HAVING COUNT(*) > 1
```

**Q 24. Write a trigger to update Emp table such that, If an updation is done in Dep table then salary of all employees of that department should be incremented by some amount (updation)**

**Ans :** Assuming Table name are Dept and Emp, trigger can be written as follows:

```
CREATE OR REPLACE TRIGGER update_trig
AFTER UPDATE ON Dept
FOR EACH ROW
DECLARE
CURSOR emp_cur IS SELECT * FROM Emp;
BEGIN
FOR i IN emp_cur LOOP
IF i.dept_no = :NEW.dept_no THEN
DBMS_OUTPUT.PUT_LINE(i.emp_no); -- for printing those
UPDATE Emp          -- emp number which are
SET sal = i.sal + 100    -- updated
WHERE emp_no = i.emp_no;
END IF;
END LOOP;
END;
```



**Q 25. There is a table which contains two columns Student and Marks, you need to find all the students, whose marks are greater than average marks i.e. list of above-average students.**

**Ans :**

```
SELECT student, marks
FROM table
WHERE marks > SELECT AVG(marks) from table;
```

**Q 26. Name the Employee who has the third-highest salary using sub queries.**

**Ans :**

```
SELECT Emp1.Name
FROM Employee Emp1
WHERE 2 = (SELECT COUNT(DISTINCT(Emp2.Salary))
          FROM Employee Emp2
          WHERE Emp2.Salary > Emp1.Salary
        )
```

**Q 27. What is a view in SQL? How to create a view?**

**Ans :** A view is a virtual table based on the result-set of an SQL statement. We can create it using create view syntax.

```
CREATE VIEW view_name AS
SELECT column_name(s)
FROM table_name
WHERE condition
```

### Q 28. What are the uses of view?

**Ans :**

- 1) Views can represent a subset of the data contained in a table; consequently, a view can limit the degree of exposure of the underlying tables to the outer world: a given user may have permission to query the view, while denied access to the rest of the base table.
- 2) Views can join and simplify multiple tables into a single virtual table.
- 3) Views can act as aggregated tables, where the database engine aggregates data (sum, average, etc.) and presents the calculated results as part of the data.
- 4) Views can hide the complexity of data.
- 5) Views take very little space to store; the database contains only the definition of a view, not a copy of all the data which it presents.
- 6) Depending on the SQL engine used, views can provide extra security.

### Q 29. What is a stored procedure?

**Ans :** A stored procedure is like a function that contains a set of operations compiled together. It contains a set of operations that are commonly used in an application to do some common database tasks.



### Q 30. What is the difference between Trigger and Stored Procedure?

**Ans :**

Sr. No.	Key	Triggers	Stored procedures
1	Basic	trigger is a stored procedure that runs automatically when various events happen (eg update, insert, delete)	Stored procedures are a pieces of the code in written in PL/SQL to do some specific task
2	Running Methodology	It can execute automatically based on the events	It can be invoked explicitly by the user
3	Parameter	It can not take input as parameter	It can take input as a parameter
4	Transaction statements	we can't use transaction statements inside a trigger	We can use transaction statements like begin transaction, commit transaction, and rollback inside a stored procedure
5	Return	Triggers can not return values	Stored procedures can return values



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