

## **DBMS Interview Theory Questions**

### **Q1. 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 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 keys in a table.

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

### **Q2. 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 and RENAME come under this.

**DML** stands for Data Manipulation Language. SQL queries like SELECT, INSERT and UPDATE come under this.

**DCL** stands for Data Control Language. SQL queries like GRANT and REVOKE come under this.

### **Q3. What is a Trigger?**

**Ans:** A Trigger is a code that 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 database.

### **Q4. 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.

### **Q5. Explain the concept of ACID properties in DBMS?**

- **Atomicity:** This is based on the concept of “**either all or nothing**” which basically means that if any update occurs inside the database then that update should either be available to all the others beyond user and application program or it should not be available to anyone beyond the user and application program.
- **Consistency:** This ensures that the **consistency is maintained in the database** before or after any transaction that takes place inside the database.
- **Isolation:** As the name itself suggests, this property states that **each transaction that is occurring is in isolation with others** i.e. a transaction which has started but not yet completed should be in isolation with others so that the other transaction does not get impacted with this transaction.
- **Durability:** This property states that the **data should always be in a durable state** i.e. any data which is in the committed state should be available in the same state even if any failure or restart occurs in the system.

#### **Q6. What is Correlated Subquery in DBMS?**

**Ans:** A Subquery is also known as a nested query i.e. a query written inside some query. When a Subquery is executed for each of the rows of the outer query then it is termed as a Correlated Subquery.

#### **Example of Non-Correlated Subquery is:**

Select \* from EMP where 'RIYA' IN (Select Name from DEPT where EMP.EMPID=DEPT.EMPID)

Here, inner query is **not executed** for each of the rows of the outer query.

#### **Q7. Explain Entity, Entity Type, and Entity Set in DBMS?**

**Ans: Entity** is an object, place or thing which has its independent existence in the real world and about which data can be stored in a database. Eg: any person, book, etc.

**Entity Type** is a collection of the entities which have the same attributes. Eg: STUDENT table contains rows in which each row is an entity holding attributes like name, age, and id of the students; hence STUDENT is an Entity Type which holds the entities having same attributes.

**Entity Set** is a collection of the entities of the same type. Eg: A collection of the employees of a firm.

#### **Q8. What are the different levels of abstraction in the DBMS?**

**Ans:** There are 3 levels of data abstraction in the DBMS. They include:

- **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.

#### **Q9. What integrity rules exist in the DBMS?**

**Ans:** There are 2 major integrity rules that exist in the DBMS. They are:

- **Entity Integrity:** This states a very important rule that value of a Primary key can never have a NULL value.
- **Referential Integrity:** This rule is related to the Foreign Key which states that either the value of a Foreign Key is a NULL value or it should be the primary key of any other relation.

#### **Q10. What is E-R model in the DBMS?**

**Ans:** E-R model is known as an Entity-Relationship model in the DBMS which is based on the concept of the Entities and the relationship that exists among these entities.

#### **Q11. What are different types of joins in the SQL?**

**Ans:** There are 4 types of SQL Joins:

- **Inner Join:** This type of join is used to fetch the data among the tables which are common in both the tables.
- **Left Join:** This returns all the rows from the table which is on the left side of the join but only the matching rows from the table which is on the right side of the join.
- **Right Join:** This returns all the rows from the table which is on the right side of the join but only the matching rows from the table which is on the left side of the join.
- **Full Join:** This returns the rows from all the tables on which the join condition has put and the rows which do not match hold null values.

**Q12. What is VDL (View Definition Language)?**

**Ans:** It specifies user views and their mappings to the conceptual schema.

**Q13. What is SDL (Storage Definition Language)?**

**Ans:** This language is to specify the internal schema. This language may specify the mapping between two schemas.

**Q14. What is SQL Deadlock?**

**Ans:** Deadlock is a unique situation in a multi user system that causes two or more users to wait indefinitely for a locked resource.

**Q15. What is difference between DELETE & TRUNCATE commands?**

**Ans:** Delete command removes the rows from a table based on the condition that we provide with a WHERE clause. Truncate will actually remove all the rows from a table and there will be no data in the table after we run the truncate command.

**Q16. What is Hashing technique?**

**Ans:** This is a primary file organization technique that provides very fast access to records on certain search conditions.

**Q17. What is Enterprise Resource Planning (ERP), and what kind of a database is used in an ERP application?**

**Ans:** Enterprise Resource Planning (ERP) is an information system used in manufacturing companies and includes sales, inventory, production planning, purchasing and other business functions. An ERP system typically uses a multiuser database.

**Q18. What is transparent DBMS?**

**Ans:** It is one, which keeps its physical structure hidden from user.

**Q19. Explain the difference between attributes and identifiers.**

**Ans:** Entities have attributes. Attributes are properties that describe the entity's characteristics. Entity instances have identifiers. Identifiers are attributes that name, or identify, entity instances.

**Q20. What is schema?**

**Ans:** The description of a data base is called the database schema, which is specified during database design and is not expected to change frequently. A displayed schema is called schema diagram. We call each object in the schema as schema construct.

## **DBMS Technical Interview Questions**

### **Q1. Differentiate Nested Loop, Hash Join and Merge Join.**

Nested loop (loop over loop)

An outer loop within an inner loop is formed consisting of fewer entries and then for individual entry, inner loop is individually processed.

E.g.

- `Select col1.*, col2.* from coll, col2 where coll.col1=col2.col2;`

It's processing takes place in this way:

For i in (select \* from col1) loop  
For j in (select \* from col2 where col2=i.col1) loop  
Results are displayed;  
End of the loop;  
End of the loop;

The Steps of nested loop are:

- Identify outer (driving) table
- Assign inner (driven) table to outer table.
- For every row of outer table, access the rows of inner table.

Nested Loops is executed from the inner to the outer as:

- outer\_loop
- inner\_loop
- Hash join

While joining large tables, the use of Hash Join is preferred.

Algorithm of Hash Join is divided into:

- Build: It is a hash table having in-memory which is present on the smaller table.
- Probe: this hash value of the hash table is applicable for each second row element.
- Sort merge join

Two independent sources of data are joined in sort merge join. Their performance is better as compared to nested loop when the data volume is big enough but it is not good as hash joins generally. The full operation can be divided into parts of two:

Sort join operation :

Get first row R1 from input1

Get first row R2 from input2.

Merge join operation:

'while' is not present at either loop's end.

if R1 joins with R2

next row is got R2 from the input 2

return (R1, R2)

else if R1 < style=""> next row is got from R1 from input 1

else

next row is got from R2 from input 2

end of the loop

## Q2. How to create Table?

**Ans.** For creating a Table in database, we have to use 'CREATE TABLE' Statement.

For Example:

CREATE TABLE "SomeName"

("col1" "datatype",

("col2" "datatype");

## Q3. What is a Join?

**Ans:** An SQL Join is used to combine data from two or more tables, based on a common field between them. For example, consider the following two tables.

Student Table

ENROLLNO	STUDENTNAME	ADDRESS
1000	geek1	geeksquiz1
1001	geek2	geeksquiz2
1002	geek3	geeksquiz3

Student Course Table

COURSEID	ENROLLNO
1	1000
2	1000
3	1000
1	1002
2	1003

Following is join query that shows names of students enrolled in different courseIDs.

SELECT StudentCourse.CourseID, Student.StudentName

```
FROM StudentCourse
INNER JOIN Customers
ON StudentCourse.EnrollNo = Student.EnrollNo
ORDER BY StudentCourse.CourseID;
```

The above query would produce following result.

COURSEID	STUDENTNAME
1	geek1
1	geek2
2	geek1
2	geek3
3	geek1

#### **Q4. What is a view in SQL? How to create one**

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

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

#### **Q5. 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

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

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