1) What is DBMS?

DBMS (Database Management System) is a computer software application that allows users and other applications to view, monitor and analyze data. It is an application to handle data on various subjects.

2) Enlist various types of interactions created by DBMS ?

There are various kinds of interactions supported by DBMS like-

- Data definition
- Update
- Retrieval
- Administration

3) What are the features of Database language?

Database language is used to create and store data in computer system. DBMS itself is one of the features of database language which is a software application for management of data. Database language also facilitates modification and alteration of query results by averaging, counting, summing, etc. Database language enables user's interaction with other applications.

4) What are different relationships existing in database?

A relationship in database is established when one table has a foreign key that references the primary key of another table. There are three relationships existing between database-

- **One-to-one**– This simple relationship exists among two tables having same rows or columns.
- **One-to-many**– Two tables connected by a foreign key and a primary key enjoys one-to-many relationship.
- **Many-to-many** – It is a complex relationship in which many records in one table is connected to many records in another table.

5) State some commands of DDL in DBMS ?

DDL commands are used to modify and edit the structure of a database system. Some of the important commands are-

1. **CREATE table command-** It defines each column of the table in a unique and distinct manner like name, data type, size, etc.

   Syntax: CREATE TABLE [column name] ([column definitions]) [table parameters]

2. **ALTER table command-** ALTER is used to make changes and edit the existing table of database. Syntax: ALTER objecttype objectname parameters.
3. **DROP table command –** DROP is used for destroying a table and all the recorded data in it. It destroys an existing database. Syntax: DROP objecttype objectname parameters.

6) What are different cursor types in DBMS ?

A database cursor enables traversal over the records in database. The different cursor types are-

- Dynamic – it is highly subject to changes while scrolling the cursor in database.
- Static – it doesn't show any changes while scrolling. It also works on recording of snapshot.
- Keyset – it enables the user to modify the data without displaying the new data.

7) Enlist the types of cursor?

There are two types of Cursor in MSSQL-

- **Implicit cursor**– Implicit cursors are automatically created whenever an SQL statement is executed and this happens without the user's notice.
- **Explicit cursor**– Explicit cursors are created with the awareness of users. It handles the SQP/PL query in one row and exercises more control over the context area.

8) List few restrictions that are imposed while creating views?

There are certain restrictions that are applied while creating views in database-

- Only current database can have views. No other database is allowed to have views other than the current database.
- You cannot make any changes in the computed values of any view.
- You cannot apply full text index definitions.
- Temporary views cannot be created and temporary tables cannot have views.
- It is not associated with any default definitions.
- There are integrity constants that define the working of commands such as insert and delete.
- Triggers such as INSTEAD of is associated with views.

9) What is join? Mention its types.

Join depicts the relationship between two or more tables. It combines row of different tables and enables you to select data with reference to data of some other table. There are several joins in database like CROSS JOINs, NATURAL JOINs, EQUI-JOIN, etc. Two most important joins are –

- **INNER JOIN** – this join returns values that have matching record in both the tables. In this, blank rows are combined in middle.
- **OUTER JOIN**– it returns all the records of left table. It also returns the values that match with the right table. Blank rows are put in specified side by joining tables in other side.

10) How index hunting contributes in improving the query performance?

Index hunting is viewed as an important part of database management system. It enhances the speed and the query performance of the database. It is done in following ways-

- In order to coordinate the study of query with workload, query optimizer is used. It also suggests the best use of queries based on the optimizer.
- Performance of query distribution is checked and monitored to know there effects.
- Turning complex database into small chunks of queries is also suggested.

11) Mention some disadvantages of query?

There are few disadvantages of query –

- There are no indexes in query.
- Triggers and procedures are SET NOCOUNT ON.
- Sometimes joins that are complicated and complex are excessively complied.
- Cursors and tables that are temporary depicts a bad presentation.

12) List few ways to code transactions in an efficient manner?

It is imperative that transactions are kept as short as possible. It should be short in order to reduce contention for resources. The following are few guidelines for coding transactions efficiently –

- It doesn’t require input from users during transactions.
- Transactions must not be opened while browsing through data.
- Make use of lower transaction levels.
- While transacting, least information of data must be accessed.

13) Differentiate between Nested loop, Hash loop and Merge Join.

Nested loop- A nested loop is a loop within a loop. It is an inner loop within an outer body that allows fewer entries. Individual entries in nested loop is processed individually in the inner loop. Example-

```
.Select col.*, col2.* from coll, col2 where coll.coll=col2.col2;

The nested way works in following format-

For i in (select*from coll) loop

For j in (select*from col2 where col2 = i.coll) loop

Results are displayed

End of the loop;

End of the loop;
```

For nested loop, first outer (driving) table is identified. Then inner tavle is assigned to the outer table and every row in inner column is accessible from every row of outer table. Nested loop is executed from hash join, inner loop and then outer loop.

Hash join- it is divided into-

- Build- this hash table has in-memory which is present on the smaller table.
- Probe – it is the hash value present in each second row element.
- Sort merge element- it joins two independent sources of data.

It is considered a better option as compared with nested loop when data volume is big. The full operation of hash join can be classified as-

Sort join operation-

```
Get first row R1 from input1

Get first row R2 from input2

Merge join operation- 'while' command is not used at loop's end.

If R1 joins with R2

Next row is got R2 from the input2

Return  (R1,R2)
```

```
else if R1 ,style="". Next row is got from R1 from

input1

else

next row is got from R2 from input 2

end of the loop.
```

14) what are the importance of partitioning in DBMS ?

Database partitioning is the process of splitting large tables into smaller database entities. Following are the benefits of partitioning-

- When rows are in one partition, query performance in such situations is improved.
- It also helps to access large parts of single partition.
- Data which are rarely used can be stored in slower and cheaper storage medium.

15) Define Atomicity and Aggregation.

Atomicity: In database management, atomicity is a concept that assures the users of the incomplete transactions. It takes care of these transactions and the actions related to incomplete transactions are left undone in DBMS.

Aggregation: It aggregates the collected entities and their relationships. In this, information is gathered and expressed in summary form.

16) Enlist various transaction phases.

There are three main transaction phases in database which includes analysis phase, redo phase and undo phase.

17) Mention some advantages of using DBMS.

DBMS is a structure that manages and handles large volumes of data stored in database. it serves as an intermediate between users and the database. Following are few advantages of database management system-

- Data redundancy- this happens when multiple copies of data is stored. With DBMS, data is stored in one structure database and the data is inputted only once.
- No unauthorized access- it discourages unauthorized access and improves data access.
- Supports multiple user interfaces.
- Minimized data inconsistency- In DBMS, data inconsistency is reduced as different versions of same data doesn't appear in different places.

18) How many types of database language exist?

There are four types of Database language, i.e. DDL, DML, DCL, and TCL which are used for reading, updating data in Database.

- **DDL**– Data Definition Language which includes CREATE, ALTER, DROP.
- **DML**– Data Manipulation Language which includes SELECT, UPDATE, INSERT, etc.
- **DCL**– Data Control Language which consists of GRANT and REVOKE.
- **TCL**– Transaction Control Language such as COMMIT and ROLLBACK.

19) List few disadvantages of File processing system.

File processing system is inconsistent and insecure. There are also chances of data redundancy and duplication. Sometimes, it gets difficult to access data and concurrent access is also not supported. There is scope of data isolation and integrity.

20) What is data independence?

Data independence reflects data transparency and specifies that the application is independent of storage structure and access strategy of data. It modifies the schema definition in one level without changing the schema level in the next level. Physical data independence and logical data independence are two types of data independence.

21) What is database normalization? Explain types of it.

In SQL, normalization of data is a process through with data is organized in tables used for the reduction of redundancy and dependency of data. It divides large tables into smaller ones using some set of rules.

Types of normalization:

- **1NF:** The rules of 1NF are that each table must contain a single value and records are required to be unique.
- **2NF:** The rules of 2NF are that the table must be in 1NF and must possess a single-column primary key.
- **3NF:** The rules of 3NF are that the table must be in 2NF and must not have any transitive functional dependencies.
- **BCNF:** The rules of the Boyce Codd Normal form is that it must be in 3 NF and must not have more than one candidate key.

22) Define DML and DCL statements?

DML stands for **Data Manipulation Language**. It is the SQL commands that deal with the manipulation of data present in the database.

For instance, Some DML commands are as follows:

The **INSERT command** uses insert into keyword which is used to insert data into a table.

The **UPDATE command** uses an update keyword which is used to update existing data within a table.

DELETE command uses the delete keyword which is used to delete records from a database table.

DCL stands for **Data Control Language**. It is SQL commands that mainly deal with the rights, permissions, and other controls of the database system.

For instance, Some DCL commands are as follows:

The **GRANT command** gives the user's access privileges to the database.

The **REVOKE command** uses the revoke keyword which is used to withdraw the user's access privileges given by using the GRANT command.

23) Write down the differences between NoSQL and RDBMS?

Following is a list of the differences between NoSQL and RDBMS: –

- In terms of data format, NoSQL does not follow any order for its data format. Whereas, RDBMS is more organized and structured when it comes to the format of its data.
- When it comes to scalability, NoSQL is more very good and more scalable. Whereas, RDBMS is average and less scalable than NoSQL.
- For querying of data, NoSQL is limited in terms of querying because there is no join clause present in NoSQL. Whereas, querying can be used in RDBMS as it uses the structured query language.
- The difference in the storage mechanism of NoSQL and RDBMS is that, NoSQL uses key value pair, documents, column storage, etc. for storage. Whereas, RDBMS uses various tables for storing data and relationships.

24) What is checkpoint in DBMS?

In **DBMS**, the **checkpoint** is a type of mechanism where all the previous logs are removed from the system and permanently stored in the storage disk. When it reaches the checkpoint, then the transaction will be updated into the database, and to that point, the entire log file will be removed from the file.

25) What is a database index?

Many Information is stored in a database and locating and retrieving the information will be difficult without an index. A **database index** is, therefore, that which makes searching and retrieving specific data or information from a database easier and faster. A database index can be likened to an old recipe box that has dividers. Through the recipe box, you are directed to various categories such as cereals, legumes, salad, soups, and vegetables. Instead of searching through all the numerous categories, a database index takes you directly to what you are looking for. The science catalog in an online library is another example of a database index.

26) What is atomicity in dbms?

In database practices, atomicity is an ACID (Atomicity, Consistency, Isolation, Durability) transaction features. An atomic transaction is an indivisible and fundamental series of database transactions such that either all occur, or nothing happens and a guarantee of atomicity halts updates to the database occurring only partially, which can provoke greater problems than rejecting the entire series outright. As an outcome, the transaction cannot be recognized to be in progress by another database user.

The above questionnaire for DBMS interviews comprises some basics and advanced level questions from the technical aspect. In the basic category, questions are asked regarding the definition and properties of a database, its advantages over the obsolete file processing system and disadvantages, **E-R model**, **normalization**, **data definition language**, **data abstraction levels** and so on. Being thorough with the subject can easily fetch you good remarks from the interviewer and will give you an edge over the others. Technical aspects also have advanced questions like interactions catered by the DBMS, extension and intension, system – R, etc., and even these are easy to answer. One may also check on integrity rules and different languages available in DBMS.