**1.What is data?**

Ans: Data is a single unit of information .

**2.What is database?**

Ans: A Database is a logical, consistent and organized collection of data that it can easily be accessed, managed and updated.

**3.What is DBMS and RDBMS?**

Ans: DBMS is a software application used to store,retrieve,and manage the data in database.

RDBMS is a type of DBMS that stores data in a table form.

**4.What is diff between SQL and MySQL?**

Ans: SQL is a query programming language that manages RDBMS.

MYSQL is a relational database management system that uses SQL.

**5.Key definition?**

Ans:

**Primary Key**: A primary key is the column or columns that contain values that uniquely identify each row in a table.

**Foreign Key:** Foreign Key is a column in a relational database table that provides a link between two table.]

**Candidate Key**: A candidate key is an attribute or set of attributes that can uniquely identify a tuple.

**Super key**: A super key is a superset of a candidate key.

**6.What is JOIN?**

Ans: JOIN clause is used to combined rows (record)from two or more tables, based on a related column between them.

**(Inner) Join**: Returns records that have matching values in both tables.

**Left (OUTER)** :JOIN : Returns all records from the left table, and the match records from the right table.

**Right(OUTER)** :JOIN: Returns all records from the right table, and the match records from the left table.

**Full (OUTER)** :JOIN: Returns all records when there is a match in either left or right table.

**7. What is checkpoint ?**

Ans: The **Checkpoint** is a type of mechanism where all the previous logs are removed from the system and permanently stored in the storage disk.

Checkpoints are used for the recovery of the database after the system crash. Checkpoints are used in the log-based recovery system. When due to a system crash we need to restart the system then at that point we use checkpoints. So that, we don't have to perform the transactions from the very starting.

A **savepoint** is a named entity that represents the state of data and schemas at a particular point within a unit of work. You can create savepoints within a transaction. If the transaction rolls back, changes are undone to the specified savepoint, rather than to the beginning of the transaction.

**8. What are the Advantage of DBMS?**

Ans:

**Advantages of DBMS:** Data Integrity, Data Independence,Accss

**9. What do you mean by transparent DBMS?**

Ans: The transparent DBMS is a type of DBMS which keeps its physical structure hidden from users.

**10. What are the unary operations in Relational Algebra?**

Ans: PROJECTION and SELECTION are the unary operations in relational algebra.

**11. How many types of database languages are?**

Ans:

There are four types of database languages:

**Data Definition Language (DDL):** DDL consist of Commands to commands like CREATE, ALTER, TRUNCATE and DROP. These commands are used to create or modify the tables in SQL.

**Data Manipulation Language (DML):** Represents a collection of programming languages explicitly used to make changes to the database, such as: CRUD operations to create, read, update and delete data. Using INSERT, SELECT, UPDATE, and DELETE commands.

**There is two type of DML:**

**Procedural DML or Low level DML:** It requires a user to specify what data are needed and how to get those data.

**Non-Procedural DML or High level DML:**It requires a user to specify what data are needed without specifying how to get those data.

**DATA Control Language (DCL):** DCL commands are used to control the access data stored in a database. Ex- Grant,Revoke

**Transaction Control Language (TCL)**: TCL is a set of commands used to manage transactions in a database management system (DBMS). Like Commit,Rollback,savepoint

**12. Grant and Revoke:**

Ans: SQL **Grant** command is specifically used to provide privileges to database objects for a user. This command also allows users to grant permissions to other users too.

**Revoke** command withdraw user privileges on database objects if any granted.

13.What is Commit,Rollback and savepoint?

Ans: The **COMMIT** command is used to permanently save the changes made during the current transaction to the database.

The **ROLLBACK** command is used to undo the changes made during the current transaction.

**SAVEPOINT** is used to set a point within a transaction to which you can later roll back.

**14. What do you understand by Data Model?**

Ans: The Data model is specified as a collection of conceptual tools for describing data, data relationships, data semantics and constraints.

**15. Define a Relation Schema and a Relation.**

Ans: A **Relation Schema** is specified as a set of attributes. It is also known as table schema. It defines what the name of the table is.

A **relation** is the set of related attributes with identifying key attributes

**16. What is the Relationship?**

The Relationship is defined as an association among two or more entities. There are three type of relationships in DBMS-

**One-To-One**: Here one record of any object can be related to one record of another object.

**One-To-Many :** Here one record of any object can be related to many records of other object and vice versa.

**Many-to-many**: Here more than one records of an object can be related to n number of records of another object.

**16. What is data abstraction in DBMS?**

Ans: Data abstraction in DBMS is a process of hiding irrelevant details from users. Because database systems are made of complex data structures so, it makes accessible the user interaction with the database.

**Following are three levels of data abstraction:**

**1.** **Physical level**: It is the lowest level of abstraction. It describes how data are stored.

**2.** **Logical level:** It is the next higher level of abstraction. It describes what data are stored in the database and what the relationship among those data is.

**3. View level:** It is the highest level of data abstraction. It describes only part of the entire database.

**17. What is ACID?**

Ans:

**1. Atomicity**: if any operation is performed on the data, either it should be performed or executed completely or should not be executed at all.

**2. Consistency**: Data is in a consistent state when a transaction starts and when it ends. If a transaction violates any rules, it's rolled back.

**3. Isolation (I):** Transaction that run concurrently appear to be serialized.

**4.Durability**: Once a transaction is committed, its changes are permanent and survive system failures. The data remains intact even if there's a power outage or a crash.

**18. What is stored procedure?**

Ans: A stored procedure is a group of SQL statements that have been created and stored in the database.

**19. What is the different between Delete , Truncate and Drop?**

Ans:

**Delete:**

i)Removes rows from a table

ii)DML

iii)can be rolled back

**Truncate:**

i)Removes all rows

ii)DDL

iii)Cannot be rolled back

**Drop:**

i)Remove a table from the database

ii)DDL

iii) cannot be rolled back

**20. What is 2-Tier architecture?**

Ans: The 2-Tier architecture is the same as basic client-server. In the two-tier architecture, applications on the client end can directly communicate with the database at the server side.

**21.What is 3- Tier architecture?**

Ans: The 3-Tier architecture contains another layer between the client and server. Introduction of 3-tier architecture is for the ease of the users as it provides the GUI, which, make the system secure and much more accessible.

**22. What is the difference between a shared lock and exclusive lock?**

Ans:

**Shared Lock**: When more than one transaction is allowed to read the data items then that is known as the shared lock.

**Exclusive lock**: When any transaction is about to perform the write operation, then the lock on the data item is an exclusive lock.

**23.Diff between group by & order by?**

Ans:

**Group by** clause is applicable when we want to use aggregate function to more than one set of rows.

**Order by** clause is applicable when we want to get the data obtained by a query in the sorting order.

**24. Nested subquery Vs Correlated subquery?**

In a **nested subquery**, the inner query is independent and doesn't rely on the outer query. The inner query is executed first, and its result is used by the outer query.(Bottom up approach).

SELECT \* from table where salary=(SELECT Max(salary) from table)

**Outer query** In a correlated subquery, the inner query depends on the outer query.

SELECT \* FROM employee WHERE EXISTS(SELECT emp\_id FROM project WHERE employee.emp\_id=project.emp\_id)

**25.Patternd Match**

Ans:

WHERE Name LIKE ‘a%’

WHERE Name LIKE ‘%a’

WHERE Name LIKE ‘%a%’

WHERE Name LIKE ‘\_a%’

WHERE Name LIKE ‘a\_%’

WHERE Name LIKE ‘a%y’

**26.Find 2nd Highest salary**

Ans:

**27. SQL and NoSQL?**

Ans:

**SQL** is the programming language used to interface with relational database.

**NoSQL** is a class of DBMS that are non-relational and generally do not use SQL

**28.Varchar VS Varchar2?**

Ans: VARCHAR is ANSI standard and VARCHAR2 is oracle standard.

**29.Triggers?**

Ans: A trigger is a special type of stored procedure that automatically runs when an event occurs in the database server.

**30.What is the sequence of execution SQL?**

Ans:

**Parsing**: Check syntax and structure.

**Compilation**: Convert query to internal representation.

**Optimization**: Choose the most efficient execution plan.

**Execution:** Access tables, apply conditions, and perform operations.

**Fetching**: Retrieve and return the result set (for SELECT queries).

**31.What are table and fields?**

Ans:

A **table** has records (rows) and fields (columns).

**Fields** have different types of data, such as text, numbers, dates, and hyperlinks.

**32.How to change a table name in SQL?**

Ans:

ALTER TABLE table\_name

RENAME COLUMN old\_name TO new\_name;

**33.How to change a Database name in SQL?**

Ans: **ALTER** **DATABASE** old\_database\_name **MODIFY** **NAME** = new\_database\_name;

**34. What is Normalization ?**

Ans:

Normalization is the process of organizing the data in the database.

Normalization divides the larger table into smaller and links them using relationships.

**35.What are the different type of SQL Operator?**

Ans.

An operator is a reserved word or a character that is used to query our database in a SQL expression.

<https://www.w3schools.com/sql/sql_operators.asp>

**36. What are Aggregate and Scaler Function?**

Ans:

A **scalar function** produces an output for each row of input, for example, taking the ABS of a column or expression.

An **aggregate function** accepts values from multiple rows and produces an output, for example, taking the maximum of a column or expression.

**37.What are Index?**

Ans: The Index in SQL is a special table used to speed up the searching of the data in the database tables.

**38.What are clustered and non-clustered index in SQL?**

Ans:

A **clustered** index is used to define the order or to sort the table or arrange the data by alphabetical order just like a dictionary.

A **non-clustered** index collects the data at one place and records at another place. It is faster than a non-clustered index.

**39. Define the "integrity rules"?**

Ans:

**Entity Integrity:** States that "Primary key cannot have NULL value”.

**Referential Integrity**: States that "Foreign Key can be either a NULL value or should be Primary Key value of other relation.

**40. What is extension and intension?**

Ans:

**Intension:** The intension of a database refers to the database schema or the structural definition. This is time dependent.

**Extension:** The extension of a database, on the other hand, refers to the actual data stored in the database at a specific moment.

**41. What are Constraints in SQL?**

Ans:

Constraints are used to specify the rules concerning data in the table. It can be

applied for single or multiple fields in an SQL table during the creation of the table or

after creating using the ALTER TABLE command. The constraints are:

**NOT NULL** - Restricts NULL value from being inserted into a column.

**CHECK** - Verifies that all values in a field satisfy a condition.

**DEFAULT** - Automatically assigns a default value if no value has been specified

for the field.

**UNIQUE** - Ensures unique values to be inserted into the field.

**INDEX** - Indexes a field providing faster retrieval of records.

**PRIMARY KEY** - Uniquely identifies each record in a table.

**FOREIGN KEY** - Ensures referential integrity for a record in another table.

**42.What is Self Join?**

Ans: A SELF JOIN is a join that is used to join a table with itself.

**43.What is Cross Join?**

Ans: A cross join returns the Cartesian product of rows from the rowsets in the join.

**44.What is Integrity?**

Ans: Integrity constraints in DBMS can be defined as a collection of rules used to ensure the quality of information.

**Data integrity** is a concept and process that ensures the accuracy, completeness, consistency, and validity of an organization's data.

**45.What is Query?**

Ans: A query in a database is a request for information from a database management system (DBMS), which is the software program that maintains data.

**46. What is a Subquery? What are its types?**

Ans:

A subquery is a query within another Query, also known as nested query or inner query.

**There are two types of subquery** - Correlated and Non-Correlated.

**A noncorrelated** (simple) subquery obtains its results independently of its containing (outer) statement.

**A correlated** subquery requires values from its outer query in order to execute.

**47. What are UNION, MINUS and INTERSECT commands?**

Ans:

**UNION**: The SQL Union operation is used to combine the result of two or more SQL SELECT queries.

**Union All** operation is equal to the Union operation. It returns the set without removing duplication and sorting the data.

**Intersect:** It is used to combine two SELECT statements. The Intersect operation returns the common rows from both the SELECT statements.

* In the Intersect operation, the number of datatype and columns must be the same.
* It has no duplicates and it arranges the data in ascending order by default.

**48.What is Cursor? And how to use ?**

Ans:

A cursor in SQL is a database object stored in temp memory and used to work with datasets. You can use cursors to manipulate data in a database, one row at a time. A cursor uses a SQL SELECT statement to fetch a rowset from a database and then can read and manipulate one row at a time.

**49. What are Entities and Relationships?**

Ans:

**Entities** are objects, concepts, or things in the real world that can be uniquely identified and have attributes representing their properties.

Example: In a university database, "Student" and "Course" are entities.

**Relationships** describe connections or associations between entities, indicating how they are related to each other.

Example: In the university database, a "Student" entity might have a "Takes" relationship with the "Course" entity, indicating enrollment.

**50.What is View?**

Ans: A view in SQL is a virtual table based on the result-set of an SQL statement. A view

contains rows and columns, just like a real table. The fields in a view are fields from

one or more real tables in the database.

**51.What is Normalization and types?**

Ans:

**52. How to create empty tables with the same structure as another table?**

Ans: using INTO operator

**SELECT** \* **INTO** Students\_copy

**FROM** Students **WHERE** 1 = 2;

**53. How will you change the datatype of a column?**

Ans: : ALTER TABLE tname

ALTER COLUMN col\_name [SET DATA] TYPE new\_data\_type;

**54. Differentiate between commit and checkpoint.**

Ans: The **commit** action ensures that the data consistency of the transaction is

maintained and it ends the current transaction in the section.

**Commit** adds a new record in the log that describes the COMMIT to the memory.

Whereas,

**a checkpoint** is used for writing all changes that were committed to disk up to SCN which would be

kept in datafile headers and control files.

**55. What is Denormalization?**

Ans: Denormalization is a database optimization technique in which we add redundant data to one or more tables.

**56. What is CLAUSE in SQL?**

Ans: A clause in SQL is a part of a query that lets you filter or customize how you want your data to be queried to you.

**57. What is the difference between a database schema and a database state?**

Ans: The collection of information stored in a database at a particular moment in time is called database state while the overall design of the database is called the database schema.

**58. Explain Entity, Entity Type, and Entity Set in DBMS?**

Ans:

**Entity**: A real-world object with a unique identity.

**Entity Type**: A category or class of entities sharing common attributes.

**Entity Set**: A collection of instances of a specific entity type at a particular time.

**59. 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.

**60. What are temporary tables? When are they useful?**

Ans: Temporary tables exist solely for a particular session, or whose data persists for the duration of the transaction. The temporary tables are generally used to support specialized rollups or specific application processing requirements. Unlike a permanent table, space is not allocated to a temporary table when it is created. Space will be dynamically allocated for the table as rows are inserted. The CREATE GLOBAL TEMPORARY TABLE command is used to create a temporary table in Oracle.

61. 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).

**62. How to Copy Table with data?**

Ans:

-- Copy all data from one table to another

INSERT INTO destination\_table (column1, column2, ...)

SELECT column1, column2, ...

FROM source\_table;

**63. Different BETWEEN & DISTINCT**

Ans:

The **BETWEEN** operator is used to filter the result set based on a range of values. It's often used in the WHERE clause of a SQL query.

SELECT \*

FROM employees

WHERE salary BETWEEN 50000 AND 80000;

The **DISTINCT** keyword is used to eliminate duplicate values from the result set. It is often used with the SELECT statement to retrieve unique values.

Syntax: SELECT DISTINCT column\_name FROM table\_name