SQL INTERVIEW QUESTIONS WITH ANSWERS

1. What is SQL?

SQL (Structured Query Language) is used to communicate with databases. It allows us to create, read, update, and delete (CRUD) data.

2. Types of SQL Commands:

- DDL (Data Definition Language): CREATE, ALTER, DROP
- DML (Data Manipulation Language): INSERT, UPDATE, DELETE
- DCL (Data Control Language): GRANT, REVOKE
- TCL (Transaction Control Language): COMMIT, ROLLBACK
- DQL (Data Query Language): SELECT

3. Difference between DELETE, TRUNCATE and DROP:

- DELETE: Removes specific rows, can be rolled back.
- TRUNCATE: Removes all rows, faster, cannot be rolled back.
- DROP: Deletes the entire table structure.

4. WHERE clause filters records based on conditions.

Example: SELECT * FROM Students WHERE Age > 18;

5. Joins combine rows from two or more tables.

- INNER JOIN: Returns matching records from both tables.
- LEFT JOIN: Returns all records from left table, matched from right.
- RIGHT JOIN: Returns all records from right table, matched from left.
- FULL JOIN: Returns all records when there is a match in either table.

6. WHERE vs HAVING:

- WHERE filters rows before grouping.

- HAVING filters groups after grouping.

7. Primary Key vs Foreign Key:

- Primary Key uniquely identifies each record.

- Foreign Key links two tables and refers to the primary key in another table.

8. Normalization:

Process of organizing data to reduce redundancy.

- 1NF: Atomic values

- 2NF: No partial dependency

- 3NF: No transitive dependency

9. Constraints:

Rules applied to table columns.

- NOT NULL, UNIQUE, PRIMARY KEY, FOREIGN KEY, CHECK, DEFAULT

10. Index:

Used to speed up the retrieval of rows. Like a book index.

11. UNION vs UNION ALL:

- UNION: Combines results and removes duplicates.

- UNION ALL: Combines results including duplicates.

12. SQL Injection:

A security attack where SQL code is inserted via input fields.

Prevent by using prepared statements or parameterized queries.

13. Subquery:

A query inside another query.

Example: SELECT Name FROM Students WHERE ID IN (SELECT StudentID FROM Marks);

14. Aggregate Functions:

Perform calculations on data.

- COUNT(), SUM(), AVG(), MAX(), MIN()

15. CHAR vs VARCHAR:

- CHAR: Fixed length, space-padded.

- VARCHAR: Variable length.

16. ACID Properties:

Ensure reliable database transactions.

- Atomicity, Consistency, Isolation, Durability

17. Views:

A virtual table based on SQL queries.

18. Can we update a view?

Yes, if the view is based on one table and no aggregations or joins.

19. Stored Procedure:

A set of SQL statements that perform a task, stored in the database.

20. Clustered vs Non-clustered Index:

- Clustered: Reorders the table data itself.

- Non-clustered: Has a separate structure from the table data.

Practice writing queries for each concept for better understanding.