1. What is SQL?

SQL (Structured Query Language) is a standard language used to communicate with relational databases. It is used for tasks like creating databases, inserting data, updating records, deleting records, and retrieving data.

2. What are the different types of SQL commands?

SQL commands are mainly divided into five categories:

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

3. What is the difference between WHERE and HAVING clause?

- WHERE is used to filter records before grouping (works on rows).
- HAVING is used to filter groups after the GROUP BY operation.

Example:

```
SELECT department, COUNT(*)
FROM employees
GROUP BY department
HAVING COUNT(*) > 5;
```

4. What is a Primary Key?

A Primary Key is a field (or combination of fields) that uniquely identifies each record in a table.

- It cannot have NULL values.
- Each value must be unique.

5. What is a Foreign Key?

A Foreign Key is a field (or collection of fields) in one table that refers to the Primary Key in another

table. It creates a relationship between two tables.

6. What is the difference between TRUNCATE, DELETE, and DROP?

- DELETE removes rows based on a condition (can be rolled back).

- TRUNCATE removes all rows quickly but cannot be rolled back.

- DROP deletes the entire table (structure + data).

7. What is a JOIN? Name types of JOINs.

A JOIN is used to combine rows from two or more tables based on a related column.

Types of JOINs:

- INNER JOIN - returns matching records.

- LEFT JOIN - returns all records from the left table and matching records from the right.

- RIGHT JOIN - returns all records from the right table and matching records from the left.

- FULL JOIN - returns all records when there is a match in either left or right table.

8. What is Normalization?

Normalization is the process of organizing data to minimize redundancy and improve data integrity. It involves dividing large tables into smaller tables and defining relationships between them.

9. What is a Subquery?

A Subquery is a query nested inside another query. It is used to perform operations that depend on the results of another query.

Example:

```
SELECT name
FROM students
WHERE marks > (SELECT AVG(marks) FROM students);
```

10. What are Constraints in SQL?

Constraints are rules enforced on data columns on a table.

Types of constraints:

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

11. What is a View in SQL?

A View is a virtual table based on the result-set of a SQL statement. It contains rows and columns just like a real table but does not store data itself.

Example:

```
CREATE VIEW view_high_salary AS
SELECT name, salary
FROM employees
WHERE salary > 50000;
```

12. What is the difference between UNION and UNION ALL?

- UNION combines results and removes duplicates.
- UNION ALL combines results and keeps duplicates.

13. What is an Index?

An Index is a database object that improves the speed of data retrieval operations on a table.

14. What are Aggregate Functions?

Aggregate functions perform a calculation on a set of values and return a single value.

Examples: SUM(), AVG(), MAX(), MIN(), COUNT()

15. Write a SQL query to fetch the second highest salary.

```
SELECT MAX(salary)
```

```
FROM employees

WHERE salary < (SELECT MAX(salary) FROM employees);
```