Q. What is SQL?

SQL (Structured Query Language) is a standard programming language used to manage and manipulate databases. It allows users to (CRUD) create, read, update, and delete data within a relational database.

Q. What are the different types of JOINs in SQL?

The main types of JOINs in SQL are:

- **INNER JOIN**: Returns records that have matching values in both tables.
- **LEFT JOIN** (or LEFT OUTER JOIN): Returns all records from the left table, and the matched records from the right table. The result is NULL from the right side if there is no match.
- **RIGHT JOIN** (or RIGHT OUTER JOIN): Returns all records from the right table, and the matched records from the left table. The result is NULL from the left side if there is no match.
- **FULL JOIN** (or FULL OUTER JOIN): Returns all records when there is a match in either left or right table.

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

- **DELETE**: Removes rows from a table based on a condition. It can be rolled back.
- **TRUNCATE**: Removes all rows from a table, resetting the table to its initial state. It cannot be rolled back.
- **DROP**: Deletes the entire table or database. It cannot be rolled back.

Q. What is a primary key?

A primary key is a column or a set of columns that uniquely identifies each row in a table. It ensures that no duplicate data exists and that each record can be uniquely identified.

Q. What is a foreign key?

A foreign key is a column or a set of columns in one table that uniquely identifies a row in another table. It creates a relationship between two tables and enforces referential integrity.

Q. What is normalization, and why is it important?

- The main goal is to eliminate duplicate data and ensure that data dependencies are logical. This helps in maintaining a clean and efficient database structure.

Q. How do you use the GROUP BY clause?

The GROUP BY clause groups rows that have the same values in specified columns into summary rows. The functions like COUNT, SUM, AVG, MAX, and MIN.

```
SELECT department, COUNT(*) AS num_employees
FROM employees
GROUP BY department;
```

Q. What is a subquery?

- A subquery is a query nested inside another query.
- It is used to perform operations that are required in a step-by-step manner, often within the SELECT, INSERT, UPDATE, or DELETE statements.

```
SELECT name
FROM employees
WHERE department_id = (SELECT department_id FROM departments WHERE name = 'Sales');
```

What is indexing, and why is it important?

- Indexing is a technique to optimize database performance by minimizing the number of disk accesses required when a query is processed.
- An index is a data structure that allows for quick retrieval of records.

What is the difference between HAVING and WHERE clauses?

- The WHERE clause is used to filter records before any groupings are made.
- The HAVING clause is used to filter records after groupings are made. The HAVING clause is often used with GROUP BY.