INTERVIEW QUESTION-ANSWERS OF SQL-STRUCTURED QUERY LANGUAGE

Here are some common **SQL interview questions** with their answers to help you prepare effectively:

1. **What is SQL?**
   Answer:
   SQL stands for **Structured Query Language**, and it is used to communicate with relational databases to perform tasks like retrieving, inserting, updating, and deleting data.

2. **What are the different types of SQL statements?**
   Answer:
   SQL statements are classified into:
   - **DDL (Data Definition Language):** CREATE, ALTER, DROP
   - **DML (Data Manipulation Language):** SELECT, INSERT, UPDATE, DELETE
   - **DCL (Data Control Language):** GRANT, REVOKE
   - **TCL (Transaction Control Language):** COMMIT, ROLLBACK, SAVEPOINT

3. **What is a primary key?**
   Answer:
   A **primary key** is a column or a combination of columns in a table that uniquely identifies each row. It cannot have duplicate or NULL values.

4. **What is a foreign key?**
   Answer:
   A **foreign key** is a column in a table that creates a relationship between two tables. It references the primary key of another table, ensuring referential integrity.

5. **What is the difference between SQL and MySQL?**
   Answer:
   - **SQL**: A language used to manage and manipulate databases.
   - **MySQL**: A database management system (DBMS) that uses SQL to interact with data.

6. **What are JOINS in SQL? Name the types.**
   Answer:
   JOINS are used to combine rows from two or more tables based on a related column. Types:
   - **INNER JOIN**: Matches rows with matching values in both tables.

- **LEFT JOIN (LEFT OUTER JOIN)**: Includes all rows from the left table and matching rows from the right table.
- **RIGHT JOIN (RIGHT OUTER JOIN)**: Includes all rows from the right table and matching rows from the left table.
- **FULL JOIN (FULL OUTER JOIN)**: Includes all rows from both tables, with NULLs where there is no match.
- **CROSS JOIN**: Produces a Cartesian product of both tables.

7. **What is a stored procedure?**
   Answer:
   A **stored procedure** is a precompiled collection of SQL statements stored in the database. It can be executed as needed to perform specific tasks, improving reusability and performance.

8. **What are indexes? Why are they used?**
   Answer:
   An **index** is a database object that improves the speed of data retrieval. It acts as a pointer to data in a table. However, indexes slow down write operations like INSERT, UPDATE, and DELETE.

9. **What is the difference between UNION and UNION ALL?**
   Answer:
   - **UNION**: Combines results from two queries and removes duplicates.
   - **UNION ALL**: Combines results and includes duplicates.

10. **What is a transaction in SQL?**
    Answer:
    A **transaction** is a sequence of operations performed as a single unit of work. Transactions ensure data integrity using properties called ACID (Atomicity, Consistency, Isolation, Durability).
    Example:

```
BEGIN TRANSACTION;
UPDATE accounts SET balance = balance - 100 WHERE account_id = 1;
UPDATE accounts SET balance = balance + 100 WHERE account_id = 2;
COMMIT;
```

11. **How do you optimize a slow query?**

Answer:

a. Use indexes on frequently queried columns.
b. Avoid SELECT *.
c. Use joins instead of subqueries where possible.
d. Analyze and optimize the query execution plan.
e. Use partitioning for large datasets.