SQL Questions and answers

**DDL (Data Definition language)**

1. What is DDL in SQL? Name all DDL commands.

Ans:- DDL(Data Definition language) in SQL is a subset of SQL commands used to define and modify the structure of database objects, such as tables, indexes, views and relationships.

* Name of all DDL commands

1. CREATE
2. ALTER
3. DROP
4. TRUNCATE
5. What is the difference between CREATE and ALTER?

Ans:- CREATE creates a new database object such as a table, index or schema while ALTER modifies the structure of an existing database object.

1. How do you delete a table structure but retain its data?

Ans:- You can not directly delete a table structure while retaining its data. However, you can achieve a similar result by using a combination of SQL commands.

For example, -- Create a new table with the same structure

CREATE TABLE new\_table AS SELECT \* FROM original\_table;

-- Drop the original table

DROP TABLE original\_table;

-- Rename the new table to the original table name

RENAME TABLE new\_table TO original\_table;

1. What is the use of TRUNCATE() vs DELETE().

Ans:- TRUNCATE() used to delete all rows from a table without deleting structure of table.

DELETE() used to remove rows from a table based on a specified condition.

1. Can we modify a column to change its datatype? How?

Ans:- Yes, you can modify a column’s datatype.

Syntax : ALTER TABLE table\_name ALTER COLUMN column\_name datatype;

1. How do you rename a table using a SQL?

Ans:- Syntax: RENAME TABLE old\_table\_name TO new\_table\_name;

1. What happens if you try to drop a table that is referenced by a foreign key?

Ans:- If you try to drop a table that is referenced by a foreign key, the DBMS will typically prevent the drop operation or require you to take specific actions to resolve the dependency.

1. Can you create a table from another existing table with structure only?

Ans:- Yes, you can create a table from another existing table with structure only, without copying the data. Syntax : CREATE TABLE new\_table LIKE existing\_table;

1. How do you add a default value to an existing column?

Ans:- You can add a default value to an existing column using the ALTER TABLE statement with the ALTER COLUMN clause.

Syntax : ALTER TABLE table\_name ALTER COLUMN column\_name SET DEFAULT default\_value;

**DML (Data Manipulation Language)**

1. What is DML? List all DML commands?

Ans:- DML used to manage and manipulate data in database. It can perform operations like inserting, updating and deleting data.

DML commands :

1. INSERT
2. UPDATE
3. DELETE
4. What is the difference between INSERT INTO and INSERT INTO ... SELECT?

Ans:- INSERT INTO inserts specific values into a table while INSERT INTO…SELECT inserts data from one or more tables into another table.

1. How do you update multiple rows at once using UPDATE?

Ans:- Syntax : UPDATE table\_name SET column1 = value1 ,column2 = value2 WHERE condition.

1. Explain how to delete duplicate rows from a table.

Ans:- Using GROUP BY and HAVING

1. Identify duplicates: Use GROUP BY and HAVING to identify the duplicate rows.

2. Delete duplicates: Use a subquery to delete the duplicate rows.

Example:

DELETE FROM table\_name a

WHERE EXISTS (

SELECT 1

FROM table\_name b

WHERE a.column1 = b.column1

AND a.column2 = b.column2

AND a.primary\_key > b.primary\_key

);

1. How can you insert data into selected columns of a table?

Ans:- Syntax : INSERT INTO table\_name (colum1,column2,column3) VALUES (value1,value2,value3);

1. How do you insert multiple rows in a single SQL query?

Ans:- Syntax : INSERT INTO table\_name (colum1,column2,column3) VALUES (value1,value2,value3),(value4,value5,value6);

1. What is MERGE in SQL? When should you use it?

Ans:- MERGE is a SQL statement that allows you to synchronize two tables by inserting, updating, or deleting rows in one table based on differences found in another table.

When to USE: Use MERGE when you need to synchronize data between two tables, such as when updating a target table based on changes in a source table.

**DCL (Data Control Language)**

1. What are DCL commands? Name them.

Ans:- DCL commands are used to control access to a database and its objects. They are used to grant or revoke privileges to users or roles.

DCL Commands:

1. GRANT:
2. REVOKE
3. What is the difference between GRANT and REVOKE?

Ans:- GRANT Grants privileges to a user or role while REVOKES revokes privileges from a user or role.

1. Can you restrict a user to only SELECT access on a particular table?

Ans:- Yes, you can restrict a user to only SELECT access on a particular data using GRANT command.

Syntax: GRANT SELECT ON table\_name TO user\_name;

1. How do you grant permission to a user on a specific column?

Ans:- Syntax: GRANT SELECT [you are giving SELECT permission to user] (column1,column2) ON table\_name TO user\_name;

1. What is the difference between roles and privileges?

Ans:- PRIVILEGES are specific rights or permissions granted to a user or role to perform certain actions on a database.

ROLES are collections of privileges that can be assigned to users or other roles.

1. What we GRANT permissions on a view instead of a table?

Ans:- Yes, you can grant permissions on a view instead of a table.

Syntax : GRANT SELECT ON view\_name TO user\_name;

**DTL / TCL (Transaction control language)**

1. What is the use of COMMIT, ROLLBACK and SAVEPOINT?

Ans:- COMMIT used to save changes made by a transaction.

ROLLBACK used to undo changes made by transaction.

SAVEPOINT used to create a temporary savepoint within a transaction.

1. What is the difference between ROLLBACK TO SAVEPOINT and ROLLBACK?

Ans:- ROLLBACK rolls back the entire transaction, undoing all changes made since the transaction begin while ROLLBACK TO SAVEPOINT rolls back transaction to a specific savepoint, undoing changes mage since the savepoint was created.

1. Explain a scenario where using SAVEPOINT is useful?

Ans:- Scenario: Using SAVEPOINT in a Complex Transaction

Suppose you're developing an e-commerce application, and you need to process a customer's order. The order processing involves multiple steps:

1. . Validate customer information
2. . Check inventory levels
3. . Create order
4. . Update inventory levels
5. . Charge customer's payment method

You want to ensure that if any step fails, the entire transaction is not rolled back. Instead, you want to roll back to a specific point in the transaction and retry or handle the error.

Using SAVEPOINT:

You can use SAVEPOINT to create a savepoint after each step, allowing you to roll back to a specific point if an error occurs.

BEGIN TRANSACTION;

-- Validate customer information

SAVEPOINT validate\_customer;

-- Check inventory levels

IF (inventory\_level < quantity) THEN

ROLLBACK TO SAVEPOINT validate\_customer;

-- Handle inventory error

ELSE

-- Create order

SAVEPOINT create\_order;

-- Update inventory levels

IF (update\_inventory\_error) THEN

ROLLBACK TO SAVEPOINT create\_order;

-- Handle inventory update error

ELSE

-- Charge customer's payment method

IF (payment\_error) THEN

ROLLBACK TO SAVEPOINT validate\_customer;

-- Handle payment error

ELSE

COMMIT;

END IF;

END IF;

END IF;

1. Is TRUNCATE a transactional command?

Ans:- TRUNCATE is a SQL command used to delete all rows from a table without logging individual row deletions.

Transactional Behaviour:

The transactional behaviour of TRUNCATE varies depending on the database management system being used.

1. What happens if an error occurs after a SAVEPOINT and before a COMMIT?

Ans:- If an error occurs after a SAVEPOINT and before a COMMIT, the transaction will not be automatically rolled back. However, you can use ROLLBACK TO SAVEPOINT to roll back to the savepoint and undo the changes made after the savepoint.

1. What is autocommit in SQL and how do you disable it?

Ans:- Autocommit is a feature in SQL that automatically commits each individual statement as it is executed, treating each statement as a separate transaction.

Disabling Autocommit:

The method to disable autocommit varies depending on the database management system being used.

Examples:

1. MySQL: SET autocommit = 0;
2. 2. PostgreSQL: Autocommit is not enabled by default. To start a transaction, use BEGIN;
3. 3. SQL Server: Autocommit is the default mode. To start a transaction, use BEGIN TRANSACTION;

**SQL CLAUSES**

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

Ans:- WHERE filters rows based on a condition applied to individual row while HAVING filters a group of rows based on conditions applied to grouped data.

1. Can we use GROUP BY without aggregate functions?

Ans:- Yes, you can use GROUP BY without aggregate functions.

Using GROUP BY without Aggregate Functions:

When you use GROUP BY without aggregate functions, the result set will contain distinct combinations of values for the columns specified in the GROUP BY clause.

1. What is the order of execution of SQL clauses in a query?

Ans:- The order of execution of SQL clauses in a query is as follows:

* 1. FROM: Specifies the tables to retrieve data from.
  2. JOIN: Combines rows from multiple tables based on join conditions.
  3. WHERE: Filters rows based on conditions.
  4. GROUP BY: Groups rows based on one or more columns.
  5. HAVING: Filters groups based on conditions.
  6. SELECT: Specifies the columns to include in the result set.
  7. DISTINCT: Removes duplicate rows from the result set.
  8. ORDER BY: Sorts the result set in ascending or descending order.
  9. LIMIT/OFFSET: Limits the number of rows returned or skips a specified number of rows.

1. Explain the use of DISTINCT with examples.

Ans:- DISTINCT used to remove duplicate rows from a result set.

For example, SELECT DISTINCT department FROM employees.

1. What is the purpose of LIMIT and how is it different from TOP?

Ans:- LIMIT restricts the number of row returned,making it useful for pagination, sampling or retriving a specific number of rows.

LIMIT vs TOP

LIMIT is used MySQL,postgresql and SQLite while TOP is used in SQL server and Microsoft access.

Both LIMIT and TOP limit the number of rows returned, but LIMIT provides more flexibility with the OFFSET clause.

1. How is the IN clause different from multiple OR conditions?

Ans:- IN Clause:

1. Concise syntax: IN clause provides a concise way to filter data based on a list of values.
2. Readability: IN clause improves readability, especially when dealing with a large list of values.

Multiple OR Conditions:

1. Verbose syntax: Multiple OR conditions require a more verbose syntax, which can be cumbersome for large lists of values.
2. Flexibility: Multiple OR conditions provide more flexibility, as you can use different operators and conditions.
3. What is the BETWEEN clause? Can it be exclusive?

Ans:- The BETWEEN clause is a SQL operator used to filter data within a specified range. It is inclusive, meaning it includes the start and end values in the range.

The BETWEEN clause is inclusive by default.

1. How do wildcards work with LIKE clause?

Ans: The LIKE clause is a SQL operator used to search for patterns in strings. Wildcards are special characters used to match unknown or variable characters in a string.

Common Wildcards:

1. .% (Percent Sign): Matches any number of characters (including zero characters).
2. \_ (Underscore): Matches exactly one character.

**Constraints**

1. What are constraints in SQL? Name the different types.

Ans:- Constraint are rules applied to columns or tables in a database to enforce data integrity and consistency. They help ensure that data is accurate, reliable and consistent.

Types of constraints:

* NOT NULL
* UNIQUE
* PRIMARY KEY
* FOREIGN KEY
* CHECKDEFAULT

1. Can a column have both UNIQUE and NOT NULL constraints?

Ans:- Yes, a column can have both UNIQUE and NOT NULL constraints.

Syntax : CREATE TABLE employees(id INT PRIMARY KEY, email VARCHAR(10)UNIQUE NOT NULL);

1. Can a table have multiple FOREIGN KEY constraints?

Ans:- Yes, table have multiple FOREIGN KEY constraints.

CREATE TABLE orders (

id INT PRIMARY KEY,

customer\_id INT,

product\_id INT,

salesperson\_id INT,

FOREIGN KEY (customer\_id) REFERENCES customers(id),

FOREIGN KEY (product\_id) REFERENCES products(id),

FOREIGN KEY (salesperson\_id) REFERENCES salespeople(id)

);

1. What is a composite primary key?

Ans:-

5. What happens if a foreign key constraint is violated? 6. What is the default behavior of ON DELETE and ON UPDATE in foreign key constraints? 7. Can we drop a NOT NULL constraint from a column?