**What is clause in SQL?**

SQL clause helps to limit the result set by providing a condition to the query. A clause helps to filter the rows from the entire set of records. (e.g. WHERE, HAVING clause)

**Difference between ‘HAVING’ CLAUSE and a ‘WHERE’ CLAUSE?**

• WHERE clause is used for filtering rows and it applies on every row, while HAVING clause is only used along with the GROUP BY function in a query and is used to filter groups.

• HAVING clause can be used only with SELECT statement; WHERE clause can be used with SELECT and other statements such as UPDATE, DELETE.

• WHERE clause cannot be used with Aggregate functions, but the HAVING clause can.

**What is the need for GROUP functions in SQL?**

Group functions work on groups of rows and return one value for the entire group. Some of the commonly used group functions are: AVG, COUNT, MAX, MIN, SUM.

**What is an ALIAS command?**

ALIAS name can be given to any table or a column. This alias name can be referred in WHERE clause to identify a particular table or a column.

**What are Aggregate and Scalar functions?**

•Aggregate functions are used to evaluate mathematical calculation and returns a single value. These calculations are done from the columns in a table.

• Scalar functions return a single value based on the input value. e.g. UCASE(), NOW(), ROUND(), MOD(x,y)

**Difference between DELETE, TRUNCATE and DROP statements?**

**DELETE:** delete rows from a table. It can be rolled back. It is a DML command.

**TRUNCATE:** delete all the rows from a table and free the space containing the table. Cannot be rolled back. It is a DDL command.

**DROP**: remove the complete data along with the table structure. It is a DDL command.

**What are JOINs in SQL?**

A JOIN clause is used to combine rows from two or more tables, based on a related column between them. It is used to merge two tables or retrieve data from there.

**Inner Join**: returns all the rows from multiple tables where the join condition is satisfied.

**Left Join:** returns all the rows from the left table but only the matching rows from the right table where the join condition is fulfilled.

**Right Join:** returns all the rows from the right table but only the matching rows from the left table where the join condition is fulfilled.

**Full Join:** returns all the records when there is a match in any of the tables. Therefore, it returns all the rows from the left-hand side table and all the rows from the right-hand side table.

**What is the difference between cross join and natural join?**

The cross join produces the cross product or Cartesian product of two tables whereas the natural join is based on all the columns having the same name and data types in both the tables.

**What do you mean by DBMS? What are its different types?**

A database is a structured collection of data. A Database Management System (DBMS) is a software application that interacts with the user, applications and the database itself to capture and analyze data. The data stored in the database can be modified, retrieved and deleted and can be of any type like strings, numbers, images etc.

There are two types of DBMS:

• Relational Database Management System: The data is stored in relations (tables).

• Non-Relational Database Management System: There is no concept of relations, tuples and attributes. Mongo

**What is SQL?**

SQL stands for Structured Query Language, and it is used to communicate with the Database. This is a standard language used for accessing and managing database.

**What do you mean by table and field in SQL?**

A table refers to a collection of data in an organized manner in form of rows and columns. A table has specified number of columns called fields but can have any number of rows which is called record.

**What is subquery in SQL?**

A subquery is a query inside another query where a query is defined to retrieve data or information back from the database. In a subquery, the outer query is called as the main query whereas the inner query is called subquery. Subqueries are always executed first and the result of the subquery is passed on to the main query.

**What are Constraints?**

Constraints are used to specify the limit on the data type of the table. It can be specified while creating or altering the table statement. The sample of constraints are:

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

**What is Auto Increment?**

Auto increment keyword allows the user to create a unique number to be generated when a new record is inserted into the table.

**What are the different operators available in SQL?**

Arithmetic Operators; Logical Operators; Comparison Operators

**What is the difference between CHAR and VARCHAR2 data type in SQL?**

• varchar2 is used for character strings of variable length

• char is used for strings of fixed length

**What is a Primary key, Unique key, Foreign key?**

•A **primary key** is a column (or collection of columns) that uniquely identifies each row in the table. Null values not allowed.

•A **unique key** uniquely identifies a single row in the table. Multiple values allowed per table. Null values allowed.

•A **foreign key** is a field in one table which can be related to the primary key of another table. Relationship needs to be created between two tables by referencing foreign key with the primary key of another table.

**What do you mean by “Trigger” in SQL?**

Trigger in SQL is are a special type of stored procedures that are defined to execute automatically in place or after data modifications. It allows you to execute a batch of code when an insert, update or any other query is executed against a specific table. Mainly, trigger helps to maintain the integrity of the database.

**What are local and global variables and their differences?**

**Local variables** are the variables which can be used or exist inside the function. They are not known to the other functions and those variables cannot be referred or used. Variables can be created whenever that function is called.

**Global variables** are the variables which can be used or exist throughout the program. Same variable declared in global cannot be used in functions. Global variables cannot be created whenever that function is called.

**What are the different subsets of SQL?**

DDL (Data Definition Language)-- It allows you to perform various operations on the database such as CREATE, ALTER and DELETE objects.

DML ( Data Manipulation Language)-- It allows you to access and manipulate data. It helps you to insert, update, delete and retrieve data from the database.

DCL ( Data Control Language) -- It allows you to control access to the database.

**What Is Relationship?**

The relationship can be defined as the connection between more than one tables in the database.(One to One, One to Many, Many to One, Many to Many Relationship)

**What is a View?**

A view is a virtual table which consists of a subset of data contained in a table. It can be used for retrieving data, as well as updating or deleting rows.

**What is the difference between clustered and non clustered index in SQL?**

• Clustered index is used for easy retrieval of data from the database and its faster whereas reading from non clustered index is relatively slower.

• Clustered index alters the way records are stored in a database as it sorts out rows by the column which is set to be clustered index whereas in a non clustered index, it does not alter the way it was stored but it creates a separate object within a table which points back to the original table rows after searching.

• One table can only have one clustered index whereas it can have many non clustered index.

**What is an Index?**

An index refers to a performance tuning method of allowing faster retrieval of records from the table. An index creates an entry for each value and hence it will be faster to retrieve data.

•**Unique Index**: This index does not allow the field to have duplicate values if the column is unique indexed. If a primary key is defined, a unique index can be applied automatically.

• **Clustered Index**: This index reorders the physical order of the table and searches based on the basis of key values. Each table can only have one clustered index.

• **Non-Clustered Index**: Non-Clustered Index does not alter the physical order of the table and maintains a logical order of the data. Each table can have many non-clustered indexes.

**What is Normalization and what are the advantages of it?**

Normalization is the process of organizing data to avoid duplication and redundancy. Normalization usually involves dividing a database into two or more tables and defining relationships between the tables. The objective is to isolate data so that additions, deletions, and modifications of a field can be made in just one table and then propagated through the rest of the database via the defined relationships.

*Advantages:* Better database organization; More tables with smaller rows; Efficient data access; Greater flexibility for queries; Quickly find the information; Easier to implement security; Allows easy modification; reduction of redundant and duplicate data; More compact database; Ensure consistent data after modification

**Explain different types of Normalization.**

There are many successive levels of normalization. These are called normal forms. Each consecutive normal form depends on the previous one.

• First Normal Form (1NF)-- No repeating groups within rows

• Second Normal Form (2NF)-- Every non-key (supporting) column value is dependent on the whole primary key.

• Third Normal Form (3NF)--Dependent solely on the primary key and no other non-key (supporting) column value.

**What do you mean by Denormalization?**

Denormalization is a database optimization technique in which we add redundant data to one or more tables. It helps to increase the performance of a database infrastructure as it introduces redundancy into a table. It adds the redundant data into a table by incorporating database queries that combine data from various tables into a single table.

**List all the types of user-defined functions?**

Scalar Functions;

Inline Table-valued functions;

Multi-statement valued functions

**What Are The Properties Of The Relational Tables?**

•Values are atomic.

•Column values are of the same kind.

•Each row is unique.

•The sequence of columns is insignificant.

•The sequence of rows is insignificant.

•Each column must have a unique name.

**LIKE operator is used for pattern matching.**

While there are multiple variations of SQL that vary slightly, such as PostgreSQL, Microsoft SQL Server, and MySQL, they are all very similar in their functionality.