Mr. Narayana
(10+ Years Exp...)

Narayana Tech House

Contact: +91-9010607010, +91-8179817681
Mail: narayanatechhouse@gmail.com
Website: www.narayanatechhouse.com
Address: #303, Nagasai Nivas,
Aster Prime Hospital Lane,
Ameerpet, Hyderabad.

SQL Interview Questions

1. What is a Database?

1. A database is an organized collection of data that is structured into tables, rows, columns, and indexes.
2. It helps the user to find the relevant information frequently. It is an electronic system that makes data access, data manipulation, data retrieval, data storing, and data management very easy.
3. Almost every organization uses the database for storing the data due to its easily accessible and high operational ease.
4. The database provides perfect access to data and lets us perform required tasks.
5. The following are the common features of a database:

   - Manages large amounts of data
   - Accurate
   - Easy to update
   - Security
   - Data integrity
   - Easy to research data

2. What does a MySQL database contain?

A MySQL database contains one or more tables, each of which contains records or rows. Within these, rows are various columns or fields that contain the data itself

3. What are MySQL Database Queries?

1. A query is a specific request or a question.
2. One can query a database for specific information and have a record returned

4. What is SQL in MySQL stand for?

a. The SQL stands for Structured Query Language.
b. This language is also used in other databases such as Oracle and Microsoft SQL Server.
c. One can use commands such as the following to send requests from a database:

```
SELECT * FROM employee WHERE name = 'Mr. Narayana;
```

5. What are the usages of SQL?

SQL is responsible for maintaining the relational data and the data structures present in the database. Some of the common usages are given below:

- o To execute queries against a database
- o To retrieve data from a database
- o To inserts records in a database
- o To updates records in a database
- o To delete records from a database
- o To create new databases
- o To create new tables in a database
- o To create views in a database
- o To perform complex operations on the database.

6. What is the difference between SQL and MySQL?

SQL vs MySQL	
SQL	**MySQL**
SQL is a standard language which stands for Structured Query Language based on the English language	MySQL is a database management system.
SQL is the core of the relational database which is used for accessing and managing database	MySQL is an RDMS (Relational Database Management System) such as SQL Server, Informix etc.

7. What do you mean by DBMS? What are its different types?

a. A Database Management System (DBMS) is a software application that interacts with the user, applications, and the database itself to capture and analyze data.
b. A database is a structured collection of data.
c. A DBMS allows a user to interact with the database.
d. 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). Example – MySQL.
- **Non-Relational Database Management System:** There is no concept of relations, tuples and attributes. Example – MongoDB

8. How can you interact with MySQL?

There are three main ways you can interact with MySQL:

       a. using a command line
       b. via a web interface
       c. through a programming language

9. What is RDBMS? How is it different from DBMS?

a. RDBMS stands for Relational Database Management System.
b. The key difference compared to DBMS, is that RDBMS stores data in the form of a collection of tables, and relations can be defined between the common fields of these tables.
c. Most modern database management systems like MySQL, Microsoft SQL Server, Oracle, IBM DB2, and Amazon Redshift are based on RDBMS.

10.What is a constraint? Tell me about its various levels.

a. The constraint is used to specify the rule and regulations that allows or restricts what values/data will be stored in the table.
b. It ensures data accuracy and integrity inside the table.
c. It enforces us to store valid data and prevents us from storing irrelevant data.
d. If any interruption occurs between the constraint and data action, the action is failed.
e. Some of the most commonly used constraints are NOT NULL, PRIMARY KEY, FOREIGN KEY, AUTO_INCREMENT, UNIQUE KEY, etc.

SQL categories the constraints into two levels:

Column Level Constraints: These constraints are only applied to a single column and limit the type of data that can be stored in that column.

Table Level Constraints: These constraints are applied to the entire table and limit the type of data that can be entered.

11.What is a Self-Join?

a. A self-join is a type of join that can be used to connect two tables.
b. As a result, it is a unary relationship. Each row of the table is attached to itself and all other rows of the same table in a self-join.
c. So, a self-join is mostly used to combine and compare rows from the same database table.

12. What are some common clauses used with SELECT query in SQL?

The following are some frequent SQL clauses used in conjunction with a SELECT query:

WHERE clause: In SQL, the WHERE clause is used to filter records that are required depending on certain criteria.
ORDER BY clause: The ORDER BY clause in SQL is used to sort data in ascending (ASC) or descending (DESC) order depending on specified field(s) (DESC).
GROUP BY clause: GROUP BY clause in SQL is used to group entries with identical data and may be used with aggregation methods to obtain summarized database results.
HAVING clause in SQL is used to filter records in combination with the GROUP BY clause. It is different from WHERE, since the WHERE clause cannot filter aggregated records.

13. What is a View?

a. A view in SQL is a virtual table based on the result-set of an SQL statement.
b. A view contains rows and columns, just like a real table.
c. The fields in a view are fields from one or more real tables in the database.

14. What are UNION, MINUS and INTERSECT commands?

The **UNION** operator is used to combine the results of two tables while also removing duplicate entries.
The **MINUS** operator is used to return rows from the first query but not from the second query.
The **INTERSECT** operator is used to combine the results of both queries into a single row.

Before running either of the above SQL statements, certain requirements must be satisfied –
a. Within the clause, each SELECT query must have the same amount of columns.

b. The data types in the columns must also be comparable.

c. In each SELECT statement, the columns must be in the same order.

15. What are the types of relationships used in MySQL?

There are three categories of relationships in MySQL:

- **One-to-One**: Usually, when two items have a one-to-one relationship, you just include them as columns in the same table.
- **One-to-Many**: One-to-many (or many-to-one) relationships occur when one row in one table is linked to many rows in another table.
- **Many-to-Many**: In a many-to-many relationship, many rows in one table are linked to many rows in another table. To create this relationship, add a third table containing the same key column from each of the other tables

16. What are SQL comments?

➢ Comments are quite important in many programming languages.
➢ SQL Comments are used to prevent SQL statements from being executed. \

Types of Comments

- Single Line Comments: It starts with two consecutive hyphens (–).
- Multi-line Comments: It starts with /* and ends with */.

17. What are Tables and Fields?

a. A table is a collection of data components organized in rows and columns in a relational database.
b. A table can also be thought of as a useful representation of relationships.
c. The most basic form of data storage is the table.
d. An example of an Employee table is shown below.

ID	Name	Department	Salary
1	Rahul	Sales	24000
2	Rohini	Marketing	34000
3	Shylesh	Sales	24000
4	Tarun	Analytics	30000

e. A Record or Row is a single entry in a table. In a table, a record represents a collection of connected data. The Employee table, for example, has four records.

f. A table is made up of numerous records (rows), each of which can be split down into smaller units called Fields(columns). ID, Name, Department, and Salary are the four fields in the Employee table above

18. What is SQL example?

SQL is a database query language that allow

s you to edit, remove, and request data from databases. The following statements are a few examples of SQL statements:

- SELECT
- INSERT
- UPDATE
- DELETE
- CREATE DATABASE
- ALTER DATABASE

19. How to create a temp table in SQL Server?

A temporary table in MySQL has many features, which are given below:

o MySQL uses the CREATE TEMPORARY TABLE statement to create a temporary table.

o This statement can only be used when the MySQL server has the CREATE TEMPORARY TABLES privilege.

o It can be visible and accessible to the client who creates it, which means two different clients can use the temporary tables with the same name without conflicting with each other. It is because this table can only be seen by that client who creates it. Thus, the user cannot create two temporary tables with the same name in the same session.

o A temporary table in MySQL will be dropped automatically when the user closes the session or terminates the connection manually.

o A temporary table can be created by the user with the same name as a normal table in a database. For example, if the user creates a temporary table with the name student, then the existing student table cannot be accessible. So, the user performs any query against the student table, is now going to refer to the

temporary student table. When the user removes a temporary table, the permanent student table becomes accessible again

```
mysql> select * from student;
+------+-------- +----------+
| sid  | sname | loc      |
+------+-------- +--------- +
|   1 | Nani   | Hyd     |
|   2 | Rohit  | Bang    |
|   3 | Kohli  | Delhi   |
|   4 | Dhoni | Chennai |
|   5 | Sai    | Hyd     |
+------+-------+------------+


mysql> CREATE TEMPORARY TABLE student(id int, sname varchar(20));

mysql> select * from student;
Empty set (0.00 sec)

mysql> drop table student;
Query OK, 0 rows affected (0.11 sec)

mysql> select * from student;
+------+-------- +----------+
| sid  | sname | loc      |
+------+-------- +--------- +
|   1 | Nani   | Hyd     |
|   2 | Rohit  | Bang    |
|   3 | Kohli  | Delhi   |
|   4 | Dhoni | Chennai |
|   5 | Sai    | Hyd     |
+------+-------+------------+
```

20. How to create a stored procedure using SQL Server?

- ➢ A stored procedure is a piece of prepared SQL code that you can save and reuse again and over.
- ➢ So, if you have a SQL query that you create frequently, save it as a stored procedure and then call it to run it.
- ➢ You may also supply parameters to a stored procedure so that it can act based on the value(s) of the parameter(s) given.

21.What is the difference between DELETE and TRUNCATE statements?

No.	DELETE	TRUNCATE
1)	The delete statement removes single or multiple rows from an existing table depending on the specified condition.	The truncate command deletes the whole contents of an existing table without the table itself. It preserves the table structure or schema.
2)	DELETE is a **DML command.**	TRUNCATE is a **DML command.**
3)	We **can use the WHERE** clause in the DELETE command.	We **cannot use the WHERE** clause with TRUNCATE.
4)	DELETE statement is used **to delete a row** from a table.	TRUNCATE statement is used **to remove all the rows** from a table.
5)	DELETE is **slower** because it maintained the log.	TRUNCATE statement is **faster** than DELETE statement as it deletes entire data at a time without maintaining transaction logs.
6)	You **can roll back** data after using the DELETE statement.	It is **not possible to roll back** after using the TRUNCATE statement.
7)	DELETE query **takes more space.**	TRUNCATE query **occupies less space.**

22. Is a blank space or zero the same as a NULL value?

No. The NULL value is not the same as zero or a blank space. The following points explain their main differences:

- A NULL value is a value, which is 'unavailable, unassigned, unknown or not applicable.' It would be used in the absence of any value. We can perform arithmetic operations on it. On the other hand, zero is a number, and a blank space is treated as a character.
- The NULL value can be treated as an unknown and missing value, but zero and blank spaces differ from the NULL value.
- We can compare a blank space or a zero to another blank space or a zero. On the other hand, one NULL may not be the same as another NULL. NULL indicates that no data has been provided or that no data exists.

23. What are functions and their usage in SQL?

SQL functions are simple code snippets that are frequently used and re-used in database systems for data processing and manipulation. Functions are the measured values. It always performs a specific task. The following rules should be remembered while creating functions:

- A function should have a name, and the name cannot begin with a special character such as @, $, #, or other similar characters.
- Functions can only work with the SELECT statements.
- Every time a function is called, it compiles.
- Functions must return value or result.
- Functions are always used with input parameters.

SQL categories the functions into two types:

- **User-Defined Function:** Functions created by a user based on their needs are termed user-defined functions.

- o **System Defined Function:** Functions whose definition is defined by the system are termed system-defined functions. They are built-in database functions.

SQL functions are used for the following purposes:

- o To perform calculations on data
- o To modify individual data items
- o To manipulate the output
- o To format dates and numbers
- o To convert data types

24. What is the difference between the WHERE and HAVING clauses?

The main difference is that the WHERE clause is used to filter records before any groupings are established, whereas the HAVING clause is used to filter values from a group. The below comparison chart explains the most common differences:

WHERE	HAVING
This clause is implemented in row operations.	This clause is implemented in column operations.
It does not allow to work with aggregate functions.	It can work with aggregate functions.
This clause can be used with the SELECT, UPDATE, and DELETE statements.	This clause can only be used with the SELECT statement.

25. What are Constraints?

Constraints in SQL 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
- CHECK

- DEFAULT
- UNIQUE
- PRIMARY KEY
- FOREIGN KEY

26. What is the difference between DROP and TRUNCATE commands?

DROP command removes a table and it cannot be rolled back from the database whereas TRUNCATE command removes all the rows from the table.

27. What is the difference between DROP and TRUNCATE statements?

- If a table is dropped, all things associated with the tables are dropped as well.
- This includes - the relationships defined on the table with other tables, the integrity checks and constraints, access privileges and other grants that the table has.
- To create and use the table again in its original form, all these relations, checks, constraints, privileges and relationships need to be redefined.
- However, if a table is truncated, none of the above problems exist and the table retains its original structure

28. What is the difference between DELETE and TRUNCATE?

The **TRUNCATE** command is used to delete all the rows from the table and free the space containing the table.
The **DELETE** command deletes only the rows from the table based on the condition given in the where clause or deletes all the rows from the table if no condition is specified. But it does not free the space containing the table

29. What are the TRUNCATE, DELETE and DROP statements?

DELETE statement is used to delete rows from a table.

```
DELETE FROM Candidates
WHERE CandidateId > 1000;
```

TRUNCATE command is used to delete all the rows from the table and free the space containing the table.

```
TRUNCATE TABLE Candidates;
```

DROP command is used to remove an object from the database. If you drop a table, all the rows in the table are deleted and the table structure is removed from the database.

```
DROP TABLE Candidates;
```

30. How many Aggregate functions are available in SQL?

- SQL aggregate functions provide information about a database's data.
- AVG, for example, returns the average of a database column's values.

SQL provides seven (7) aggregate functions, which are given below:

- AVG(): returns the average value from specified columns.
- COUNT(): returns the number of table rows, including rows with null values.
- MAX(): returns the largest value among the group.
- MIN(): returns the smallest value among the group.
- SUM(): returns the total summed values(non-null) of the specified column.
- FIRST(): returns the first value of an expression.
- LAST(): returns the last value of an expression.

31. What is Pattern Matching in SQL?

- SQL pattern matching provides for pattern search in data
- This kind of SQL query uses wildcards to match a string pattern, rather than writing the exact word.
- The LIKE operator is used with **SQL Wildcards** to fetch the required information.

- **Using the % wildcard to perform a simple search**

The % wildcard matches zero or more characters of any type and can be used to define wildcards both before and after the pattern. Search a student in your database with first name beginning with the letter K:

```
SELECT *
FROM students
WHERE first_name LIKE 'K%'
```

- **Omitting the patterns using the NOT keyword**

  Use the NOT keyword to select records that don't match the pattern. This query returns all students whose first name does not begin with K.

  ```
  SELECT *
  FROM students
  WHERE first_name NOT LIKE 'K%'
  ```

- **Matching a pattern anywhere using the % wildcard twice**

  Search for a student in the database where he/she has a K in his/her first name.

  ```
  SELECT *
  FROM students
  WHERE first_name LIKE '%Q%'
  ```

- **Using the _ wildcard to match pattern at a specific position**

  The _ wildcard matches exactly one character of any type. It can be used in conjunction with % wildcard. This query fetches all students with letter K at the third position in their first name.

  ```
  SELECT *
  FROM students
  WHERE first_name LIKE '__K%'
  ```

- **Matching patterns for a specific length**

  The _ wildcard plays an important role as a limitation when it matches exactly one character. It limits the length and position of the matched results. For example -

  ```
  SELECT *    /* Matches first names with three or more letters */
  FROM students
  WHERE first_name LIKE '___%'

  SELECT *    /* Matches first names with exactly four characters */
  FROM students
  WHERE first_name LIKE '____'
  ```

32. What do you mean by "Trigger" in SQL?

Trigger are 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

33. 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.
- It can be nested inside a SELECT, UPDATE or any other query. A subquery can also use any comparison operators such as >,< or =.

34. What is the need for group functions in SQL?

- Group functions work on the set of rows and return one result per group.
- Some of the commonly used group functions are: AVG, COUNT, MAX, MIN, SUM, VARIANCE.

35. What is the difference between 'HAVING' CLAUSE and a 'WHERE' CLAUSE?

- HAVING clause can be used only with SELECT statement.
- It is usually used in a GROUP BY clause and whenever GROUP BY is not used, HAVING behaves like a WHERE clause.
- Having Clause is only used with the GROUP BY function in a query whereas WHERE Clause is applied to each row before they are a part of the GROUP BY function in a query.

36. What are the various levels of constraints?

Constraints are the representation of a column to enforce data entity and consistency. There are two levels of a constraint, namely:

- column level constraint
- table level constraint

37. What is an ALIAS command?

- ALIAS command in SQL is the name that 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.

38. 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. For example-max(),count() are calculated with respect to numeric.
- Scalar functions return a single value based on the input value. For example – UCASE(), NOW() are calculated with respect to string.

39. Name the operator which is used in the query for pattern matching?

LIKE operator is used for pattern matching, and it can be used as -.

1. **%** – It matches zero or more characters.

   For example- select * from students where studentname like 'a%'

2. **-(Underscore)** – it matches exactly one character.
   For example- select * from student where studentname like '_____'

40. What is a View?

- A view is a virtual table which consists of a subset of data contained in a table.
- Since views are not present, it takes less space to store.
- View can have data of one or more tables combined and it depends on the relationship.

41. What are Views used for?

A view refers to a logical snapshot based on a table or another view. It is used for the following reasons:

- Restricting access to data.
- Making complex queries simple.

- Ensuring data independence.
- Providing different views of same data.

42. List some advantages and disadvantages of Stored Procedure?

Advantages:
A Stored Procedure can be used as a modular programming which means create once, store and call for several times whenever it is required. This supports faster execution. It also reduces network traffic and provides better security to the data.

Disadvantage:
The only disadvantage of Stored Procedure is that it can be executed only in the database and utilizes more memory in the database server.

43. What are Local and Global variables?

Local variables:

These variables can be used or exist only inside the function. These variables are not used or referred by any other function.

Global variables:

These variables are the variables which can be accessed throughout the program. Global variables cannot be created whenever that function is called.

44. What is a Datawarehouse?

- Datawarehouse refers to a central repository of data where the data is assembled from multiple sources of information.
- Those data are consolidated, transformed and made available for the mining as well as online processing.
- Warehouse data also have a subset of data called Data Marts.

45. What are MySQL Triggers?

- A trigger is a task that executes in response to some predefined database event, such as after a new row is added to a particular table.

↓ Specifically, this event involves inserting, modifying, or deleting table data, and the task can occur either prior to or immediately following any such event. Triggers have many purposes, including:

- Audit Trails
- Validation
- Referential integrity enforcement

46. How many Triggers are possible in MySQL?

There are six Triggers allowed to use in the MySQL database:

1) Before Insert
2) After Insert
3) Before Update
4) After Update
5) Before Delete
6) After Delete

47. How many Aggregate functions are available in SQL?

↓ The aggregate function is used to determine and calculate several values in a table and return the result as a single number.
↓ For example, the average of all values, the sum of all values, and the maximum and minimum value among particular groupings of values.

The following syntax illustrates how to use aggregate functions:

function_name (DISTINCT | ALL expression)

SQL provides seven (7) aggregate functions, which are given below:

o AVG(): This function is used to returns the average value from specified columns.

o COUNT(): This function is used to returns the number of table rows, including rows with null values.

o MAX(): This function is used to returns the largest value among the group.

o MIN(): This function is used to returns the smallest value among the group.

o SUM(): This function is used to returns the total summed values(non-null) of the specified column.

- o FIRST(): This function is used to returns the first value of an expression.
- o LAST(): This function is used to returns the last value of an expression

48. What is the difference between SQL having vs where?

S. No	Where Clause	Having Clause
1	The WHERE clause specifies the criteria which individual records must meet to be selected by a query. It can be used without the GROUP by clause	The HAVING clause cannot be used without the GROUP BY clause
2	The WHERE clause selects rows before grouping	The HAVING clause selects rows after grouping
3	The WHERE clause cannot contain aggregate functions	The HAVING clause can contain aggregate functions
4	WHERE clause is used to impose a condition on SELECT statement as well as single row function and is used before GROUP BY clause	HAVING clause is used to impose a condition on GROUP Function and is used after GROUP BY clause in the query
5	SELECT Column,AVG(Column_nmae)FROM Table_name WHERE Column > value GROUP BY Column_nmae	SELECT Columnq, AVG(Coulmn_nmae)FROM Table_name WHERE Column > value GROUP BY Column_nmae Having column_name>or<value