

Interview Questions and answers on SQL Server

1. What is DBMS ?

The database management system is a collection of programs that enables user to store, retrieve, update and delete information from a database.

2. What is RDBMS ?

Relational Database Management system (RDBMS) is a database management system (DBMS) that is based on the relational model. Data from relational database can be accessed or reassembled in many different ways without having to reorganize the database tables. Data from relational database can be accessed using an API , Structured Query Language (SQL).

3. What is SQL ?

Structured Query Language(SQL) is a language designed specifically for communicating with databases. SQL is an ANSI (American National Standards Institute) standard.

4. What are the different type of SQL's statements ?

This is one of the frequently asked SQL Interview Questions to freshers. SQL statements are broadly classified into three. They are

1. DDL – Data Definition Language

DDL is used to define the structure that holds the data. For example, Create, Alter, Drop and Truncate table.

2. DML– Data Manipulation Language

DML is used for manipulation of the data itself. Typical operations are Insert, Delete, Update and retrieving the data from the table. Select statement is considered as a limited version of DML, since it can't change data in the database. But it can perform operations on data retrieved from DBMS, before the results are returned to the calling function.

3. DCL– Data Control Language

DCL is used to control the visibility of data like granting database access and set privileges to create tables etc. Example - Grant, Revoke access permission to the user to access data in database.

5. what is a field in a database ?

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A field is an area within a record reserved for a specific piece of data.

Examples: Employee Name, Employee ID etc

6. What is a Table in a database ?

A table is a collection of records of a specific type. For example, employee table, salary table etc.

7. What are the purpose of Normalisation?

Ans:

Minimize redundancy in data.

Remove insert, delete and update anomaly during the database activities.

Reduce the need to reorganize data it is modified or enhanced.

Normalisation reduces a complex user view to a set of small and stable subgroups of fields or relations.

8. You want to implement the following relationships while designing tables. How would you do it?

a.) One-to-one

b.) One-to-many

c.) Many-to-many

a.) One-to-One relationship - can be implemented as a single table and rarely as two tables with primary and foreign key relationships.

b.) One-to-Many relationships - by splitting the data into two tables with primary key and foreign key relationships.

c.) Many-to-Many - by using a junction table with the keys from both the tables forming the composite primary key of the junction table.

9. What is the difference between a local and a global variable?

A local temporary table exists only for the duration of a connection or, if defined inside a compound statement, for the duration of the compound statement.

A global temporary table remains in the database permanently, but the rows exist only within a given connection. When connection is closed, the data in the global temporary table disappears. However, the table definition remains with the database for access when database is opened next time.

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10. What is SQL Server Agent?

SQL Server agent plays an important role in the day-to-day tasks of a database administrator (DBA). It is often overlooked as one of the main tools for SQL Server management. Its purpose is to ease the implementation of tasks for the DBA, with its full- function scheduling engine, which allows you to schedule your own jobs and scripts.

11.How to change Database name in SQL Server?

Use following code

Supported in SQL Server 2000 and 2005
`exec sp_renamedb "test", "test1"`

12.What command do we use to rename a db?

`sp_renamedb 'oldname' , 'newname'`

13.What is a tuple?

A tuple is an instance of data within a relational database.

14.Difference between varchar and char:

varchar are variable length strings with a maximum length specified. If a string is less than the maximum length, then it is stored verbatim without any extra characters.

char are fixed length strings with a set length specified. If a string is less than the set length, then it is padded with extra characters so that it's length is the set length.

Use **varchar** when your strings do not have a fixed length (e.g. names, cities, etc.)

Use **char** when your strings are always going to be the same length (e.g. phone numbers, zip codes, etc).

15.What is the use of bit data type and what kind of data is stored into it?

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Bit datatype is used to store boolean information like 1 or 0 where 1 is considered as true and 0 is considered as false.

While querying the database we need to use 1 or 0 in the select statement to filter out the data instead of true and false.

16.Query to display List of All Databases in SQL Server 2005/2008?

```
SELECT * FROM Sys.Databases
```

17. What are wild cards used in database for Pattern Matching ?

SQL Like operator is used for pattern matching. SQL 'Like' command takes more time to process. So before using "like" operator, consider suggestions given below on when and where to use wild card search.

- 1) Don't overuse wild cards. If another search operator will do, use it instead.
- 2) When you do use wild cards, try not to use them at the beginning of the search pattern, unless absolutely necessary. Search patterns that begin with wild cards are the slowest to process.
- 3) Pay careful attention to the placement of the wild card symbols. If they are misplaced, you might not return the data you intended.

18.What is Union and Union All operator?

Union is used to combine distinct records from two tables. Union all combines all records from two tables.....

19. What is an ALIAS command?

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

20. How to select unique records from a table?

Select unique records from a table by using DISTINCT keyword.

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21. What database does SQL Server use for temporary tables?

Ans:

TempDB

22. Query To Get The Column Name, Data Type, And Length of columns in a Tables?

```
select column_name, data_type, character_maximum_length from information_schema.columns  
where table_name = { Table Name }
```

23. How to get values of identity column when you are not sure about the column name which is identity column?

```
SELECT IDENTITYCOL FROM TableName
```

24. What are constraints?

SQL Server uses constraints to enforce limitations on the data that can be entered into a particular column in a table. There are following types of constraints.

Unique, Default, Check, Primary Key, Foreign Key, Not Null.

a. What is PRIMARY KEY?

A PRIMARY KEY constraint is a unique identifier for a row within a database table. Every table should have a primary key constraint to uniquely identify each row and only one primary key constraint can be created for each table. The primary key constraints are used to enforce entity integrity.

b. What is UNIQUE KEY constraint?

A UNIQUE constraint enforces the uniqueness of the values in a set of columns, so no duplicate values are entered. The unique key constraints are used to enforce entity integrity as the primary key constraints.

c. What is FOREIGN KEY?

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A FOREIGN KEY constraint prevents any actions that would destroy links between tables with the corresponding data values. A foreign key in one table points to a primary key in another table. Foreign keys prevent actions that would leave rows with foreign key values when there are no primary keys with that value. The foreign key constraints are used to enforce referential integrity.

d. What is CHECK Constraint?

A CHECK constraint is used to limit the values that can be placed in a column. The check constraints are used to enforce domain integrity.

What is NOT NULL Constraint?

Ans:

A NOT NULL constraint enforces that the column will not accept null values. The not null constraints are used to enforce domain integrity, as the check constraints.

SQL DEFAULT Constraint

The DEFAULT constraint is used to insert a default value into a column if no other value supplied

25. What is a Composite Key ?

A Composite primary key is a type of candidate key, which represents a set of columns whose values uniquely identify every row in a table.

For example - if "Employee_ID" and "Employee Name" in a table is combined to uniquely identify a row its called a Composite Key.

26. What is Identity (Autoincrement)?

Identity (or AutoNumber) is a column that automatically generates numeric values. A start and increment value can be set, but most DBA leave these at 1. A GUID column also generates numbers; the value of this cannot be controlled. Identity/GUID columns do not need to be indexed.

```
Select distinct id from employee;
```

27.What's the maximum size of a row?

8060 bytes. Don't be surprised with questions like 'what is the maximum number of columns per table'. Check out SQL Server books online for the page titled: "Maximum Capacity Specifications".

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28.How to Get nth Record in a Table?

First Get the n records from the table using

Select Top n FROM UserTable

Now Reverse the Order using identity Column like:

Select Top n FROM UserTable Order By 1 DESC

Now we need nth record that can be get as

SELECT TOP 1 * FROM (Select Top n FROM UserTable Order By 1 DESC)AC

For Example i need to get 5th record From userTable then query will be like this:

SELECT TOP 1 * FROM (SELECT TOP 5 * FROM UserTable Order By 1 DESC)AC

29. What is difference between DELETE , TRUNCATE & DROP commands?

Delete command removes the rows from a table based on the condition that we provide with a WHERE clause. Truncate will actually remove all the rows from a table and there will be no data in the table after we run the truncate command.

1. TRUNCATE:

1. TRUNCATE is faster and uses fewer system and transaction log resources than DELETE.
2. TRUNCATE removes the data by deallocating the data pages used to store the table's data, and only the page deallocations are recorded in the transaction log.
3. TRUNCATE removes all rows from a table, but the table structure, its columns, constraints, indexes and so on, remains. The counter used by an identity for new rows is reset to the seed for the column.
4. You cannot use TRUNCATE TABLE on a table referenced by a FOREIGN KEY constraint. Because TRUNCATE TABLE is not logged, it cannot activate a trigger.
5. TRUNCATE cannot be rolled back.
6. TRUNCATE is DDL Command.
7. TRUNCATE Resets identity of the table

2. DELETE:

1. DELETE removes rows one at a time and records an entry in the transaction log for each deleted row.
2. If you want to retain the identity counter, use DELETE instead. If you want to remove table definition and its data, use the DROP TABLE statement.

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3. DELETE Can be used with or without a WHERE clause
4. DELETE Activates Triggers.
5. DELETE can be rolled back.
6. DELETE is DML Command.

DELETE does not reset identity of the table

3. **Drop** command is used to drop the table or keys like primary,foreign from a table.

30. What is a join?

This is a keyword used to query data from more tables based on the relationship between the fields of the tables. Keys play a major role when JOINS are used.

31. What are the types of join and explain each?

There are various types of join which can be used to retrieve data and it depends on the relationship between tables.

Inner join.

Inner join return rows when there is at least one match of rows between the tables.

Right outer Join.

Right join return rows which are common between the tables and all rows of Right hand side table. Simply, it returns all the rows from the right hand side table even though there are no matches in the left hand side table.

Left outer Join.

Left join return rows which are common between the tables and all rows of Left hand side table. Simply, it returns all the rows from Left hand side table even though there are no matches in the Right hand side table.

Full outer Join.

Full join return rows when there are matching rows in any one of the tables. This means, it returns all the rows from the left hand side table and all the rows from the right hand side table.

Cross Join

A cross join that does not have a WHERE clause produces the Cartesian product of the tables

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involved in the join. The size of a Cartesian product result set is the number of rows in the first table multiplied by the number of rows in the second table.

32. Name 3 ways to get an accurate count of the number of records in a table?

1. `SELECT * FROM table1`
`SELECT COUNT(*) FROM table1`
`SELECT rows FROM sysindexes WHERE id = OBJECT_ID(table1) AND indid < 2`

33. What is the STUFF function and how does it differ from the REPLACE function?

STUFF function is used to overwrite existing characters. Using this syntax, STUFF (string_expression, start, length, replacement_characters), string_expression is the string that will have characters substituted, start is the starting position, length is the number of characters in the string that are substituted, and replacement_characters are the new characters interjected into the string.

REPLACE function to replace existing characters of all occurrences. Using the syntax REPLACE (string_expression, search_string, replacement_string), where every incidence of search_string found in the string_expression will be replaced with replacement_string.

34. Differentiate between a HAVING CLAUSE and a WHERE CLAUSE.

HAVING CLAUSE

- HAVING CLAUSE is used only with the SELECT statement.
- It is generally used in a GROUP BY clause in a query.
- If GROUP BY is not used, HAVING works like a WHERE clause.

WHERE Clause

- It is applied to each row before they become a part of the GROUP BY function in a query.

35. What do you understand by a view?

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

Syn:-Create view vw_nm as select * from emp;

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36.Query to Get List of Views?

```
select * from information_schema.views
```

37. What are all the different types of indexes?

There are three types of indexes -.

Unique Index.

This indexing does not allow the field to have duplicate values if the column is unique indexed. Unique index can be applied automatically when primary key is defined.

Clustered Index.

This type of index reorders the physical order of the table and search based on the key values. Each table can have only one clustered index.

NonClustered Index.

NonClustered Index does not alter the physical order of the table and maintains logical order of data. Each table can have 999 nonclustered indexes.

38.What is a table called, if it has no Cluster Index?

Unindexed table or Heap.

39.What is Subquery in SQL Server?

A subquery is a query that is nested inside a SELECT, INSERT, UPDATE, or DELETE statement, or inside another subquery. Subquery is an inner query or inner select, while the statement containing a subquery is also called an outer query or outer select.

40.What are the restrictions of using Subquery in SQL Server?

Subquery can be used where an expression is possible. There are certain limitation of using Subquery, they are

A subquery is subject to the following restrictions:

#. The select list of a subquery introduced with a comparison operator can include only one

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expression or column name (except that EXISTS and IN operate on SELECT * or a list, respectively).

#. If the WHERE clause of an outer query includes a column name, it must be join-compatible with the column in the subquery select list.

#. The ntext, text, and image data types cannot be used in the select list of subqueries.

#. Because they must return a single value, subqueries introduced by an unmodified comparison operator (one not followed by the keyword ANY or ALL) cannot include GROUP BY and HAVING clauses.

#. The DISTINCT keyword cannot be used with subqueries that include GROUP BY.

#. The COMPUTE and INTO clauses cannot be specified.

#. ORDER BY can only be specified when TOP is also specified.

#. A view created by using a subquery cannot be updated.

41. What is a stored procedure?

Stored Procedure is a function consists of many SQL statement to access the database system. Several SQL statements are consolidated into a stored procedure and execute them whenever and wherever required.

42. Can a stored procedure call itself or recursive stored procedure? How much level SP nesting is possible?

Yes. Because Transact-SQL supports recursion, you can write stored procedures that call themselves. Recursion can be defined as a method of problem solving wherein the solution is arrived at by repetitively applying it to subsets of the problem. A common application of recursive logic is to perform numeric computations that lend themselves to repetitive evaluation by the same processing steps. Stored procedures are nested when one stored procedure calls another or executes managed code by referencing a CLR routine, type, or aggregate. You can nest stored procedures and managed code references up to 32 levels.

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43. What are the advantages of using Stored Procedures?

1. Stored procedure can reduced network traffic and latency, boosting application performance.
2. Stored procedure execution plans can be reused, staying cached in SQL Server's memory, reducing server overhead.
3. Stored procedures help promote code reuse.
4. Stored procedures can encapsulate logic. You can change stored procedure code without affecting clients.
5. Stored procedures provide better security to your data.

44.How Can we Write the Transaction Block in SQL Server?

```
BEGIN TRANSACTION

Statement 1
Statement 2
.....
.....
IF(@ERROR>0)
ROLLBACK TRANSACTION
ELSE
COMMIT TRANSACTION
```

45. What is Difference between Function and Stored Procedure?

UDF can be used in the SQL statements anywhere in the WHERE/HAVING/SELECT section where as Stored procedures cannot be. UDFs that return tables can be treated as another rowset. This can be used in JOINS with other tables. Inline UDF's can be thought of as views that take parameters and can be used in JOINS and other Rowset operations.

46.Difference Between Implicit Transaction And Explicit Transaction

Implicit Transaction is the auto commit. There is no beginning or ending of the transaction.

Explicit Transaction has the beginning, ending and rollback of transactions with the command
Begin Transaction
Commit Transaction and
Rollback Transaction

In the explicit transaction, if an error occurs in between we can rollback to the beginning of the transaction which cannot be done in implicit transaction.

47.What is a deadlock?

Deadlock is a situation when two processes, each having a lock on one piece of data, attempt to acquire a lock on the other's piece. Each process would wait indefinitely for the other to release the lock, unless one of the user processes is terminated.

SQL Server detects deadlocks and terminates one user's process

48.what is ACID?

ACID (an acronym for Atomicity Consistency Isolation Durability) is a concept that Database Professionals generally look for when evaluating databases and application architectures. For a reliable database all this four attributes should be achieved.

49. What is Cursor?

Cursor is a database object used by applications to manipulate data in a set on a row-by- row basis, instead of the typical SQL commands that operate on all the rows in the set at one time.

In order to work with a cursor we need to perform some steps in the following order:

1. Declare cursor
2. Open cursor
3. Fetch row from the cursor
4. Process fetched row
5. Close cursor
6. Deallocate cursor

50. 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.

51. What are all types of user defined functions?

Three types of user defined functions are.

- Scalar Functions.
- Inline Table valued functions.
- Multi statement valued functions.

52.What is trigger?

A DB trigger is a code or programs that automatically execute with response to some event on a table or view in a database. Mainly, trigger helps to maintain the integrity of the database.

53.How we can Get List of Triggers?

```
select * from Sys.Objects where Type='tr'
```

54. How To view current system data time ?

```
Select CURRENT_TIMESTAMP
```

```
Select getdate()
```

55. How to change date format ?

```
SET DATEFORMAT ymd
```

56.Define function floor ?

FLOOR: **return** the largest integer less than the given value.

```
syn-SELECT FLOOR(-145.677)
```

57.what is the value of ASCII('A'):

A is 65

58.CHAR: the reverse of the ASCII **function** as it changes a numeric value in to an ASCII character.

58. what is DENSE_RANK() ?

The DENSE_RANK() function in SQL Server returns the position of a value within the partition of a result set, leaving no gaps in the ranking where there are ties.

```
select DENSE_RANK() over (order by sal)as supersal,name,id from deptt
```

59. what is CAST function ?

The CAST function is a very useful SQL Server 2005 function that allows you to change a data type of a column. The CAST result can then be used fo

```
select CAST (sal as money)from deptt
```

60. Specifies a subquery to test for the existence of rows.

Example :

```
SELECT * FROM Students WHERE EXISTS  
(  
SELECT * FROM Students WHERE CollegeCode='B2'  
)
```

61.What is schema?

A schema is an independent entity- a container of objects distinct from the user who created those objects.

Default schema is - dbo