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SQL SERVER

Interview Questions

[EXCLUSIVE NOTES]

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21. List out and explain Scalar functions in SQL Server.

Answer: Functions that accept a single value and also produce a single value output are called scalar functions. Below are some scalar functions used in SQL Server:

- **mid():**

We use the mid() function to retrieve a substring from an input string.

- **ucase():**

This function returns the uppercase of the given input.

- **lcase():**

The lcase() function returns the lowercase of the given input.

- **format():**

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This function returns the input value in a specific format.

- **len():**

The len() function returns the length of the given input.

- **round():**

This function rounds off the given numerical input up to three decimal places.

- **now():**

We use the now () function to fetch the system's current time and date.

22. What is a stored procedure in SQL Server?

Answer: A collection of T-SQL statements grouped together as a single logical unit is called a stored procedure in SQL Server. We can store stored procedures in a database and use them whenever required. If a certain program requires a code block, again and again, we can store that code block as a stored procedure. The syntax for creating a stored procedure in SQL Server is:

```
CREATE PROCEDURE procedure_name AS sql_statement GO;
```

To execute a created stored procedure, use the below syntax:

```
EXEC procedure_name ;
```

23. What do you mean by the trigger?

Answer: A trigger in SQL Server is analogous to a stored procedure. Alternatively, we can call a trigger a database object. When an event takes place in a database, a trigger is fired. However, we cannot fire or activate a trigger in SQL Server. It gets invoked automatically. In other words, we can use a trigger in SQL Server to make an event happen in a database

automatically. DML triggers and DDL triggers are two kinds of triggers in SQL Server.

- **DML Triggers:**

When we use any DML command like INSERT, UPDATE, and DELETE on a table's or a view's data, DML triggers are fired. These triggers help preserve a database's consistency and integrity.

- **DDL Triggers:**

DDL triggers are raised when several DDL events take place. These events are associated with Transact-SQL statements that begin with CREATE, DENY, REVOKE, ALTER, GRANT, or DROP.

24. Explain a view in a database.

Answer: A view in SQL Server is a virtual table consisting of the data from multiple tables. In addition, a view also stores data in rows and columns. However, a view is not present physically in a database as a stored procedure. Therefore, it does not require storage in a database. Like a database table, a view should also have a unique and unrepeated name. The syntax for creating a view in SQL Server is:

```
CREATE VIEW view_name AS SELECT Column1, Column2, ..., ColumnN FROM tables WHERE condition;
```

25. What is an index in SQL Server?

Answer: In SQL Server, an index is used to fetch row data quickly from a database's view or table. It is an on-disk structure linked to a view or a table in a database. In addition, there are keys in an index developed using one or more attributes or columns of a view or a table. A structure called B-Tree stores index keys, enabling SQL Server to retrieve corresponding rows rapidly and efficiently. The two different kinds of indexes in SQL Server are:

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- **Clustered Index:**

A clustered index in SQL Server represents the order in which the data in the database should be stored physically. However, data in a database table can be sorted in only one way. Therefore, there is only one clustered index for a single table. Moreover, a clustered index is created automatically when we declare a primary key constraint on a table's attribute.

- **Non-Clustered Index:**

Indexes that do not sort physical data within a database are non-clustered indexes. More importantly, the table data and non-clustered index are not present in one place.

26. Explain the difference between clustered and non-clustered indexes.

Answer: The below table shows dissimilarities between clustered and non-clustered indexes:

Clustered Index	Non-Clustered Index
This type of index is quicker, and clustered index operations require less memory space.	It is relatively slower than the clustered one, and non-clustered index operations consume a lot of memory.
An index is original data.	An index is a copy of data.
A table in SQL Server has only one clustered index.	A table can have several non-clustered indexes.
The table data in the clustered index is stored in an index's lead nodes.	A non-clustered index does not store the table data in lead nodes.

27. List out SQL Server's two authentication modes.

Answer: Two authentication modes in SQL Server are Mixed Mode and Windows Mode

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28. Define global and local temporary tables in SQL Server.

Answer:

Global Temporary Table: A table that is noticeable to all users when the connection is established and gets deleted when the connection is closed is called a global temporary table.

Syntax:

CREATE TABLE ##<tablename>

Local Temporary Table: A table that is visible to only the creator of the connection and gets deleted when the connection is closed is called a local temporary table.

Syntax:

```
CREATE TABLE #<tablename>
```


29. Tell the query used to get triggers' list in a database.

Answer: Query to receive the list of triggers is:

```
SELECT * FROM sys.objects WHERE type = 'tr';
```

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30. Which query will you use to get the SQL Server's current version?

Answer: The SQL query to fetch SQL Server's current version is:

```
SELECT SERVERPROPERTY('productversion');
```

31. Enlist all three different ways to fetch the total count of records present in a table.

We can retrieve the total number of records in a table by using the following three ways: **First Method:**

SELECT * FROM <tablename>

Second Method:

SELECT count(*) <tablename>

Third Method:

SELECT rows from sysindexes

WHERE id=OBJECT_ID(tablename) and intid<2

32. List out different types of backup in SQL Server.

The following are the different types of backup in SQL Server:

- Full Backup
- Differential Backup
- Transaction Log Backup
- File Backup
- FileGroup Backup
- Partial Backup
- Copy-Only Backup
- Mirror Backup

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33. What is the difference between SQL Server and MySQL?

The following table highlights the differences between SQL Server and MySQL:

Microsoft SQL Server (MS SQL Server)	**MySQL**
MS SQL Server is developed by Microsoft.	MySQL is developed by Oracle Corporation.
This relational database management system is not free.	It is an open-source relational database management system (RDMS) and is freely available.
It is highly secured since it does not support database file manipulation while running.	MySQL supports database file manipulation while running.
MS SQL Server requires a large amount of operational storage space.	MySQL consumes a less amount of operational storage space.
This RDBMS is available in the following editions: • Enterprise • Standard • Web • Workgroup • Express	This RDBMS is available in the following editions: • Standard • Enterprise • Cluster-grade

Advanced-Level SQL Server Interview Questions

34. What do you know about SQL Injection?

SQL Injection, often referred to as SQLI, is one of the most common web hacking techniques. In SQL Injection, hackers inject malicious SQL statements into an entry field for execution and access confidential information from databases. In other words, SQL injection is an attack where hackers manipulate SQL code to gain unauthorized access to a web application's database.

35. Explain magic tables in SQL Server.

Whenever there are data manipulation operations, such as insert, delete, or update, SQL Server creates temporary logical tables, which are magic tables. Any operation that you perform recently on a particular row of a table, SQL Server stores it in a magic table. However, magic tables are only temporary internal tables and not physical tables.

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36. Do you know what hotfixes and patches are in SQL Server?

Hotfixes in SQL Server are updates to fix certain issues that are not released publicly. On the other hand, patches in SQL Server are updates to fix certain issues that are known publicly.

37. What do you know about SSRS in SQL Server?

SSRS stands for SQL Server Reporting Services. It is a set of on-premises tools and services that enables users to create and manage paginated and mobile reports. Alternatively, it is a set of tools and services that lets you generate formatted reports with tables in the form of images, charts, and graphs.

38. What is a SQL Server Agent?

A SQL Server Agent is a Microsoft Windows service that is responsible for executing the scheduled administrative tasks. These administrative tasks are referred to as jobs in SQL Server, which include scheduling backups, log-shipping tasks, or handling reporting services. A SQL Server Agent runs a job on schedule on-demand or as a response to a specific event.

39. Explain SQL Server Log Shipping.

SQL Server Log Shipping is an automated way of backing up and restoring databases from one server instance to another or more server instances. The primary purpose of log shipping is to increase the availability of databases by maintaining their backup in other server instances. As a result, we can say that log shipping is one of the ways to disaster recovery.

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40. What is SQL Server Profiler?

A SQL Server Profiler is a graphical user interface (GUI) tracing tool that Microsoft has introduced in SQL Server 2000 version. It is responsible for tracing activities and operations that you carry out on a specific SQL Server database engine. It allows us to monitor, analyze, troubleshoot, and trace problems in SQL databases.

41.Enlist all the editions of SQL Server.

There are five different editions of SQL Server that are as follows:

- **Standard:** This edition provides fundamental data management and business intelligence database for small organizations so that they can run their applications.
- **Enterprise:** This edition is the premium offering that delivers comprehensive data center capabilities with lightning-fast performance and unlimited virtualization. It allows end-user access to data insights and high-level services for mission-critical workloads.
- **Web:** The Web Edition is a low total cost-of-ownership option ideal for Web hosters and Web VAPs to offer scalability, manageability, and affordability capabilities.
- **Express:** It is a free and entry-level database. This is widely used for learning and building small data-driven applications.
- **Developer:** With this edition, developers can build any type of application on the top of SQL Server.

42. Can you tell the difference between the HAVING and WHERE clauses?

We use the WHERE clause to filter the records from a particular table or join two tables based on certain conditions. Only those records will be displayed that meet the condition specified in the WHERE clause. The HAVING clause filters the records from the groups based on the condition specified in the HAVING clause. Some other differences between the HAVING and WHERE clauses are as follows:

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WHERE	HAVING
We can use the WHERE clause without the GROUP BY clause.	We cannot use the HAVING clause without the GROUP BY clause.
The WHERE clause implements in a row operation.	The HAVING clause implements in a column operation.
It cannot contain any aggregate function.	It can contain an aggregate function.
We can use this clause with SELECT, DELETE, and UPDATE statements.	We can use this clause only with the SELECT statement.
It is always used before the GROUP BY clause.	It is always used after the GROUP BY clause.

43. Can you tell the purpose of the UPDATE STATISTICS and the SCOPE_IDENTITY() function?

UPDATE STATISTICS: It updated query optimization statistics on a table or an indexed view. The primary purpose of this statement is to optimize query performance.

Syntax:

UPDATE STATISTICS table_or_indexed_view_name

SCOPE_IDENTITY (): This function returns the last identity values that were generated in any table in the current session.

Syntax:

SCOPE_IDENTITY ()

44. Enlist a few encryption mechanisms in SQL Server.

The following are a few encryption mechanisms in SQL Server that encrypt data in a database:

- Transparent Data Encryption
- Symmetric Keys
- Asymmetric Keys
- Transact SQL functions
- Certificates

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45. How will you allow the usage of optimistic models?

There are two options that we need to set to allow the usage of optimistic models. These two options are as follows:

- READ_COMMITED_SNAPSHOT for the read committed optimistic model
- ALLOW_SNAPSHOT_ISOLATION for the snapshot isolation level

46. Can you tell the use of the SIGN() function in SQL Server?

The SIGN() function in SQL Server returns the sign of a number. It will return one of the following:

- If a number is greater than 0, it returns 1,
- If a number is equal to 0, it returns 0,
- And, if a number is less than 0, it returns -1.

Syntax: SIGN(number)

47. Which command will you use to check the locks in SQL Server?

There is a built-in stored procedure named 'sp_locks' in SQL Server to check the locks.

Syntax:

sp_lock [[@spid1 =] 'session ID1'] [, [@spid2 =] 'session ID2'] [;]

48. Explain the COALESCE () function in SQL Server.

The COALESCE () function returns the first non-null expression within the arguments that you pass to it. Syntax: SELECT COALESCE (CustID, CustName, Amount) from Customers;

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49. What are SQL joins? List out the types of joins.

SQL joins are used to combine rows from two or more tables based on one related column between those two tables. The following are the types of joins in SQL:

- **Inner Join:** It returns records that have matching values from both tables.
- **Right Join:** It returns all the records from the right table and the matched values from the left table.
- **Left Join:** It returns all the records from the left table and the matched values from the right table.
- **Full Join:** It returns records when there is a match in either the left or right table.

50. Enlist the most common trace flags used in SQL Server.

We use trace flags in SQL Server to set the specific characteristics of the server. The following are the common trace flags used in SQL Server:

- Log Record for Connections: 4013
- Skip Startup Stored Procedures: 4022
- Deadlock Information: 1204, 1205, 1222
- Do Force uniform extent allocations instead of mixed page allocations 1118 (SQL 2005 and 2008).
- Disable Locking Hints: 8755
- Network Database files: 1807