**SQL Server:**

**-**RDBMS, provides functionality of storing and retrieving data to applications.

**Which TCP/IP port does SQL Server run on?**

-port 1433

-can be configured to listen to a specific port

**Index Configurations:**

**-*A clustered index:*** When only a single clustered index is present

-***A non-clustered index:*** when only a single non-clustered index is present

-***Many-non clustered index:*** more than one non-clustered index is present

-***A clustered index and a non-clustered index***

***-A clustered index and many non-clustered index***

***-No index***

**Clustered Vs. Non-clustered index:**

**-**Clustered index physically sorts the rows of a table based on the PK

-Non-clustered index is an index structure that is separate from the actual table which sorts one or more selected columns

-Querying data is fast in CI. NCI is faster when there is no index in a table

-Only one CI per table but multiple NCI

-Doesn’t need extra disk space, needs extra space

-CI is faster than NCI in terms of SELECT statements

**Authentication modes in SQL Server:**

-***Windows Authentication***

-default authentication mode

-Trusted user and group accounts are verified when they login to the system.

-No additional credentials required

***-Mixed Authentication***

-supports windows authentication as well as SQL authentication

-Windows authentication is same as above

-SQL authentication requires username and password login

**Database design and performance of the SQL Server based application**

**-**Generally, people do not care much about the database design when data is less because there isn’t noticeable performance issues.

-When data grows there will be significant performance issues because of data redundancy. This is where normalization is needed.

-Right design principle ensure better performance at the later stages of software development. There will not be much redundant data which leads to reduced storage uses and also reduce overhead to maintain consistency in the database.

**CHECK constraint:**

-CHECK constraint is applied to any column to limit the values that can be placed in it. It helps to enforce integrity in the database.

CREATE TABLE Users (

Id int NOT NULL,

First\_name varchar (255) NOT NULL,

Last\_name varchar (255) Not NULL,

Age int CHECK (Age >= 18 AND Age <=60)

);

**Trigger in SQL Server:**

**-**Trigger is a special type of stored procedure.

-It gets invoked automatically when an event like INSERT, UPDATE, DELETE, etc. happens

-can be used to enforce referential integrity in the database

**Types of triggers**:

***DML trigger:*** -gets fired whenever a user tries to manipulate data using DML event.

-INSERT, DELETE, UPDATE

***DDL trigger:*** -gets fired whenever a user tries to manipulate data using DDL event

-CREATE, ALTER, DROP

***Logon trigger:*** -gets fired when a LOGON event is raised whenever a user’s session is created.

CREATE [OR REPLACE] TRIGGER trigger\_name

{BEFORE | AFTER | INSTEAD OF}

{INSERT | UPDATE | DELETE}

[OF colonnade]

ON table\_name

[REFERENCING OLD AS o NEW AS n]

[FOR EACH ROW]

WHEN (condition)

DECLARE

Declaration statements

BEGIN

Executable statements

EXCEPTION

Exception handling statements

END;

**Local and global temporary tables:**

-Temporary tables are ephemeral in nature.

-They are useful when we want to work with a small subset of records from a large table

-***Local temporary tables:***

-only visible to that session of SQL that has created it

-automatically dropped when the session of the SQL Server that has created it is closed

-prefixed with #

-SQL Server appends some random number at the end of local temporary table name

-***Global temporary tables:***

-visible to all SQL Server sessions

-dropped when last session of SQL Server referencing to the global temp table is closed.

-prefixed with ##

-doesn’t append any random number at the end of the name

**SQL Server Agent:**

-A background tool for MSSQL. It helps DBA to schedule a job to run after a specific interval of time. These tasks can be scheduling backups, handling reporting services subscription or log-shipping.

**Backups in SQL Server:**

**-*Full backup:*** -includes all database objects, system tables and data.

-transactions during backup are also recorded.

-***Transaction log backup:*** -records transactions since the precious backup

-***Differential backup:*** -backs the data that has been altered since the last full backup

**Scheduled tasks in SQL Server:**

Predefined steps or tasks that are automatically executed sequentially at a scheduled time by SQL Server Agents.

**COALESCE:**

-This function returns the first non-null value from a list

-returns null if all the values are null

SELECT COALESCE (NULL, 2, 1, 3) \*\*OUTPUT: 2\*\*

**How are exceptions handled in SQL Server Programming?**

**-*Using try and catch block***

BEGIN TRY

--code which might raise exceptions

END TRY

BEGIN CATCH

--code to run if error occurs in try block

END CATCH

BEGIN TRY

SELECT 5/0 AS Error;

END TRY

BEGIN CATCH

SELECT

ERROR\_NUMBER () AS ErrorNumber,

ERROR\_STATE () AS ErrorState,

ERROR\_SEVERITY () AS ErrorSeverity,

ERROR\_PROCEDURE () AS ErrorProcedure,

ERROR\_LINE () AS ErrorLine,

ERROR\_MESSAGE () AS ErrorMessage;

END CATCH

Those functions are usable only inside catch block, else they return false.

**Reporting Services in SQL Server:**

SSRS is a set of tools that help in generating reports. Businesses can use it for getting visual insights into data.

**What is log shipping?**

It is a process in which we automate backup process of transaction log files. We backup files from a primary database server to a secondary (stand by) database server.

To set up the log shipping process you must have sysadmin rights on the server.

Log shipping helps in mitigating the risk of disasters. In case of production server failure, we can use the secondary server.

**Master Data Services**

**-**made my MS to develop Master Data Management built on top of SQL Server for backend processing.

**Hotfixes and Patches in SQL Server:**

**-**Hotfixes are the updates to fix issues which are not released publicly.

-Patches are the updates to fix unknown bugs or issues. MS manages patches publicly.

**Magic Tables:**

-Two magic tables: *inserted* and *deleted*

-they do not exist physically

-“inserted” stores data of last inserted row or “insert operation”

-”deleted” stores the data of last deleted row or “delete operation”

**SQL Server provides two ways to view magic tables:**

**-*Use Triggers***

CREATE TRIGGER Inserted\_Trigger

ON Employee

FOR INSERT

AS

BEGIN

SELECT \* FROM Inserted

END

***-Use OUTPUT clause***

INSERT INTO Employee OUTPUT Inserted.\*VALUES (‘Robert’)