# DBA Technical Interview Questions

**Candidate Name : \_**

**Date of Interview : \_**

**Agency : \_**

**Total Score : \_ / 142 Pass Mark: 107 (75%)**

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|  | Q. You are tasked with carrying out a migration of SQL Server Data from On-Premise to the Cloud. Detail the methods this can be achieved and the use-case for each.  A. **Stretch Database**. Large Databases can migrate data incrementally. Migration is over longer period  A. **BCP**. Data only. Good network link to Cloud required for speed.  A. **DAC/BACPack**. Smaller databases – usually only code and reference data. Can have automated deployment.  A. **Backup and Restore via Azure Storage**. Can be a lengthy process. Lots of steps. No restore to Azure SQL.  A. **SSIS**. Requires additional coding. Good if only parts of data need to be migrated. Good network link to Cloud required.  A. **Azure Data Factory**. Same as **SSIS**. | **Total \_\_\_/ 6**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1** |
|  | Q. What changes can be made to SQL Server by the DBA to alleviate locking?  A. **Database Snapshots**  A. **Snapshot isolation Level**  A. **Query/Lock hints** **(rowlock, readpast, nolock)**  A. **Change TSQL Code to ensure consistent object access order**  A. **Ensure correct indexing has been applied for query** | **Total \_\_\_/ 5**  **/1**  **/1**  **/1**  **/1**  **/1** |
|  | When using SQL Server Replication, how do we add more articles to a publication without generating a FULL snapshot?  A. **Specify @property = 'allow\_anonymous'**  A. **Specify @property = 'immediate\_sync'** | **Total \_\_\_/ 2**  **/1**  **/1** |

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|  | Q. What are the differences between OLTP and OLAP?  A. **OLTP is for processing operational, transactional data, such as processing sales. OLAP is for analysing data, predicting trends and reporting.**  A. **OLTP normalised schema, OLAP de-normalised.**  A. **OLTP use pattern is a mix of read and write throughout the business day. OLAP processing occurs in batches and users tend to only read the data.**  A. **OLTP data tends to come from an application. OLAP data tends to come from a variety of data sources.** | **Total \_\_\_/ 4**  **/1**  **/1**  **/1**  **/1** |
|  | Q. What process does SQL Server follow when storing data to disk?  A. Data Page is latched  Log record is generated  **Data page is modified (becomes ‘dirty’)**  Data Page latch released  A. Commit transaction is issued  **Log records flushed (written) to disk (LDF)**  OS confirms write and commit completes  A. **Checkpoint is issued**  **All modified (‘dirty’) pages up to the latest LSN flushed to disk are flushed (written) to disk (MDF)**  Checkpoint log record generated | **Total \_\_\_/ 10**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1** |
|  | Q. What is a checkpoint operation and when does it occur?  A.Occurs on **Backup** operation  A.Occurs **automatically** based on recovery time  A.Occurs on **manual** CHECKPOINT TSQL query  A. All **modified** (‘Dirty’) **pages** are **written** to disk  A. **Only modified** (‘Dirty’) **pages** which are **included in logs** already **written to disk** are flushed (written) by the checkpoint  A. A **log** record describing the **checkpoint** is **generated**  A. The **LSN** of the checkpoint is **recorded** **in** the database **boot page**  A. For SIMPLE recovery mode databases, **inactive transactions are cleared** from the log | **Total \_\_\_/ 8**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1** |

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|  | Q. Scenario.   * 2 Data Centres * Database can be hosted from either Data Centre * Automatic and Manual Failover of databases * maximum uptime * Minimum data loss   A. **Always On Availability Groups is the best solution**  A. **Always On availability groups.**  Can automatically or manually failover  If network connection good enough can have synchronous commit to ensure minimum data loss  Quick to failover, so minimum downtime  Listener can be used to allow applications to be failover agnostic  Can offload read and backup operations to secondary  A. **Windows Failover clustering**  Can automatically or manually failover  Quick to failover, so minimum downtime  Applications do not need to be changed after failover  -Nodes have stringent specification requirements  -Heartbeat can be erratic if network connection between DCs is not robust causing superfluous failovers  -Can’t offload read and backup operations  -Needs shared disks  A. **Replication**  -No automatic failover  -Data loss for periods when replication jobs/process not running  A. **Log shipping**  - No automatic failover  - Data loss for period after the last log backup  A. **Mirroring**  -Needs a witness server for automatic failover  -Failover at DB level. This means individual DBs can failover between sites, so you could have Primary databases running on both nodes  -Marked as deprecated for future versions of SQL Server | **Total \_\_\_/ 25**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1** |

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|  | Q. Describe the process to change the location of the TempDB. Do the same for the Master Database.  A. **TempDB and Master – check SQL Server has correct permission on new directory**  A. **TempDB – issue alter database modify file statement for new location**  A. **TempDB and Master – Stop SQL Server**  A. **Master – Copy data and log files to new location**  A. **Master – Alter Startup Parameter –d with new master datafile location**  A. **Master – Alter Startup Parameter –e with new master transaction log file location**  A. **TempDB and Master – Start SQL Server**  A. **TempDB and Master – remove/cleanup files from previous location.** | | **Total \_\_\_/ 8**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1** |
|  | Q. With SQL Server installed on Windows Failover Clustering – what are the differences between an Active/Active (AA) cluster and an Active/Passive (AP) cluster?  A. **AA clustering must have at least 2 virtual SQL instances. AP the minimum is 1 virtual SQL instance.**  A. **In AA** clustering **all nodes** in the cluster **are running** at least **1 SQL virtual instance**. **In AP** at least **1 node** (the passive) **is running no virtual SQL instances**.  A. **In AP** a failover causes all virtual SQL instances to fail from the Active node to the Passive. **The nodes switch roles.**  A. In **AA a failover may increase the burden** on the node being failed over to. The nodes will need to be specified or configured to be able to handle running multiple SQL instances in the event of failover or there may be a degraded performance for the SQL server.  A. In **AA all nodes must be license**. In AP the passive may not be licensed (depending on the licensing agreement purchased) | | **Total \_\_\_/ 5**  **/1**  **/1**  **/1**  **/1**  **/1** |
|  | | Q. What is the maximum size of a row in SQL Server?  A. **8060 bytes (8KB)**  A. From SQL 2005 onwards **Large Row support** means row overflow data can be moved off a row’s page. | **Total \_\_\_/ 2**  **/1**  **/1** |

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|  | Q. What are the differences between a Primary Key and a Unique Key?  A. **A Primary key can contain no NULLs. A Unique Key can have 1 NULL**  A. **A table can only have 1 Primary Key. A table can have multiple Unique Keys.**  A. **By default a clustered index is created on a Primary Key. On a Unique key the default is non-clustered.** | **Total \_\_\_/ 3**  **/1**  **/1**  **/1** |
|  | Q. What causes out of date statistics and how do you avoid this?  A. **Significant changes to the data** in the table – bulk upload, delete, truncate.  A. **Upgrade of database**  A. **Auto update statistics is turned off**  A. **Auto create statistics is turned off**  A. **Turn on auto update statistics**  A. **Turn on auto create statistics**  A. Run **sp\_updatestats**  A. Run **UPDATE STATISTICS**  A. Run **DBCC UPDATEUSAGE**  A. Run a **Re-index** operation | **Total \_\_\_/ 10**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1** |
|  | Q. Scenario. Describe the recovery process for:  - Daily Full backup  - Hourly Transaction log backups  A. If possible take **tail-log backup**  A. **Restore** last **Full Backup** as **NORECOVERY**  A. **Restore** every **transaction log backup** from the last Full Backup, except the last transaction log backup, as **NORECOVERY**  A. **Restore** the **last transaction log** backup with **RECOVERY** | **Total \_\_\_/ 4**  **/1**  **/1**  **/1**  **/1** |

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|  | Q. Scenario. Application is slow and you’ve been asked to check the database. What steps would you follow and which tools would you use?  A. **sp\_who2**  A. **Activity monitor**  A. **sp\_whoisactive**  A. check for **stale statistics**  A. check **indexes**  A. Check Server **Performance Counters** – CPU, Memory, Disk Waits, Network Utilisation  A. Check for **running sql agent jobs**  A. Check for **application batch processes**  A. Check for **long-running queries** (reports etc) that may have gone wrong  A. **Liaise with other relevant teams** (Windows, Networks, Service Desk) to check for wider/non-SQL issue  A. **Anything else** that seems sensible | **Total \_\_\_/ 15**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/?** |
|  | What is SQL Injection and what steps can you take to prevent or mitigate it?  A. SQL Injection is **the insertion of malicious code** into SQL Statements that are executed against the database, typically carried-out on an application or web server.  A. Ensure accounts connecting to SQL Server have the **policy of least-privilege** applied – that is to say, the account can only do what was specified and no more  A. **Valid any input**. Check parameters and dynamic SQL to ensure the input is what is expected  A. Keep **patching** up to date  A. **Use prepared statements or stored-procedures** | **Total \_\_\_/ 5**  **/1**  **/1**  **/1**  **/1**  **/1** |

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|  | Name 3 features of SQL Server 2019 that you have used or are interested in?  A. **Big data clusters. Kubernetes hosted Hadoop/Spark/Polybase/SQL 2019 cluster for end to end BI**  A. **Polybase**  A. Intelligent Database   * + **Row mode memory grant feedback**   + **Batch mode on rowstore**   + **Scalar UDF inlining**   + **APPROX\_COUNT\_DISTINCT**   + **Excessive memory grant correction**   A. **Always encrypted with secure enclaves**  A. **TDE suspend/resume**  A. **In-memory TempDB**  A. **OPTIMISE\_FOR\_SEQUENTIAL\_KEY**  A. **Hybrid Buffer Pool**  A. **UTF-8 Character Encoding support**  A. **JAVA for SQL Server**  A. **Data Discovery and Classification**  A. **SQL Server Certificate Management**  A. **AG now 5 Sync Replicas**  A. **Accelerated Database Recovery**  A. **Max DOP config in setup**  A. **Min and Total Max memory config in setup**  A. **Anything else that seems valid** | **Total \_\_\_/ 3**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**  **/1**    **/1**  **/1**  **/1**  **/1**  **/1**  **/1** |
|  | Q. What is SQL Server Always on and what requirements does it have?  A.SQL Server **HA/DR** solution  A.Requires **Windows Server Failover Clustering**  A. Uses concept of **Availability Groups** as unit of failover | **Total \_\_\_/ 3**  **/1**  **/1**  **/1** |

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|  | Q. What is an Extended Stored Procedure? Can you give an example of one?  A. A function within a DLL that can be called from T-SQL  A. xp\_cmdshell  A. xp\_grantlogin  A. xp\_logininfo  A. xp\_sqlmaint | **Total \_\_\_/ 2**  **/1**  **/1**  **/1**  **/1**  **/1** |
|  | Q. What is SQL Server Analysis Services (SSAS)?  A. On-Line Analytical Processing engine (OLAP)  A. Used for Data analysis, mining and trends.  A. Runs as separate service  A. In-memory Cubes  A. Multidimensional. User can analyse data stored in Measures and Facts | **Total \_\_\_/ 5**  **/1**  **/1**  **/1**  **/1**  **/1** |
|  | Q. What factors should you consider when choosing a primary key?  A. Narrow (small datatype)  A. Unique  A. Static (does not change)  A. Ever increasing – increases sequentially upwards. | **Total \_\_\_/ 4**  **/1**  **/1**  **/1**  **/1** |
|  | Q. What are the differences between the TRUNCATE and DELETE statements?  A. DELETE is fully logged. TRUNCATE is minimally logged  A. DELETE can have a WHERE clause to filter a subset of data to delete. TRUNCATE only deletes the whole table  A. DELETE IS DML, TRUNCATE IS DDL | **Total \_\_\_/ 3**  **/1**  **/1**  **/1** |
|  | Q. How do you start SQL Server in Single User Mode  A. Configure startup parameter –m and restart service  A. Run SQL Server Service from shell with –m switch | **Total \_\_\_/ 2**  **/1**  **/1** |

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|  | Q. When might you use the WITH (NOLOCK) query hint?  A. When absolute **accuracy** is **not required**  A. On **non-live systems**  A. When **reading** the **data** only (It only affects SELECT) | **Total \_\_\_/ 3**  **/1**  **/1**  **/1** |
|  | Q. Why might the transaction log of a database become full?  A. **BULK** or **FULL** Recovery mode and Transaction **Log backups are not running** or not running often enough  A. **Long running transaction** such as a re-index  A. **Distributed or Linked Server transaction**  A. **Replication/Mirroring/AG transaction is active and not committing**  A. **Large DML query** | **Total \_\_\_/5**  **/1**  **/1**  **/1**  **/1**  **/1** |