SQL Server L1 DBA Interview Questions & Answers (120+ Cheat Sheet)

This guide contains 120+ frequently asked SQL Server L1 DBA interview questions with short, crisp answers. Perfect for quick revision.

1. Basic SQL Server Concepts (20 Q&A;)

Q: What are the system databases?
Ans: master, msdb, model, tempdb.

Q: What is SQL Server?
Ans: Microsoft RDBMS for storing and managing relational data.

Q: Difference between Instance and Database?
Ans: Instance = running SQL Server service, Database = collection of data.

Q: What is a Primary Key?
Ans: Unique identifier for rows, cannot be NULL.

Q: Difference between Clustered & Non-Clustered Index?
Ans: Clustered = sorted data, one per table; Non-Clustered = separate structure, many per table.

Q: What is a Foreign Key?
Ans: Links data between two tables to maintain referential integrity.

Q: Difference between DELETE & TRUNCATE?
Ans: DELETE = logs each row, can rollback; TRUNCATE = faster, cannot rollback in Simple mode.

Q: What is a View?
Ans: Virtual table created using SELECT query.

Q: What are DMVs?
Ans: Dynamic Management Views, used for monitoring performance.

Q: How to check SQL Server version?
Ans: SELECT @@VERSION;

Q: What is a Schema?
Ans: Logical container for database objects.

Q: Difference between CHAR & VARCHAR?
Ans: CHAR = fixed length, VARCHAR = variable length.

Q: What is a Stored Procedure?
Ans: Precompiled set of SQL statements.

Q: What is a Function?
Ans: Returns a single value or table, unlike procedures.

Q: What is a Trigger?
Ans: Special procedure that executes on INSERT, UPDATE, DELETE.

Q: How to list all databases?
Ans: SELECT name FROM sys.databases;

Q: How to list all tables in a database?
Ans: SELECT * FROM sys.tables;

Q: What is TempDB?
Ans: System DB used for temporary storage, recreated on restart.

Q: What is SQL Profiler?

Ans: Tool to trace and debug SQL activity.

Q: What are ACID properties?
Ans: Atomicity, Consistency, Isolation, Durability.

2. Backup & Recovery (15 Q&A;)

Q: Types of backups?
Ans: Full, Differential, Transaction Log, Copy-only.

Q: How to take a full backup?
Ans: BACKUP DATABASE dbname TO DISK='C:\backup.bak';

Q: How to restore a database?
Ans: RESTORE DATABASE dbname FROM DISK='C:\backup.bak';

Q: What is a Tail-log backup?
Ans: Final backup before database restore.

Q: Difference between Simple & Full Recovery?
Ans: Simple = no T-Log backups, Full = supports point-in-time restore.

Q: How to find last backup date?
Ans: SELECT name,last_backup_finish_date FROM sys.databases d LEFT JOIN msdb.dbo.backupset b ON d.name=b.database_name;

Q: What is Point-in-time recovery?
Ans: Restoring database to a specific time using T-Log backups.

Q: How to backup a specific table?
Ans: No direct way; export via BCP or SSIS.

Q: How to schedule backups?
Ans: Use SQL Server Agent Jobs.

Q: What is Copy-only backup?
Ans: Independent backup without affecting backup chain.

Q: What is CHECKDB?
Ans: DBCC CHECKDB checks database consistency.

Q: What is RESTORE VERIFYONLY?
Ans: Checks backup validity without restoring.

Q: How to restore DB with MOVE?
Ans: RESTORE DATABASE db FROM DISK='C:\b.bak' WITH MOVE='logical' TO 'path';

Q: How to list all backups?
Ans: SELECT * FROM msdb.dbo.backupset;

Q: How to restore DB to another server?
Ans: Copy .bak file and run RESTORE DATABASE.

3. Performance Tuning & Monitoring (20 Q&A;)

Q: How to find top 5 slow queries?
Ans: Use sys.dm_exec_query_stats with ORDER BY total_worker_time DESC.

Q: How to check current running queries?
Ans: SELECT * FROM sys.dm_exec_requests;

Q: How to check blocking?
Ans: EXEC sp_who2;

Q: How to kill a session?
Ans: KILL ;

Q: What is an Execution Plan?
Ans: Shows how SQL processes a query.

Q: What are Wait Statistics?
Ans: Helps find performance bottlenecks.

Q: How to check CPU usage?
Ans: Use sys.dm_exec_query_stats and sys.dm_os_performance_counters.

Q: How to reduce index fragmentation?
Ans: ALTER INDEX REBUILD or REORGANIZE.

Q: How to update statistics?
Ans: UPDATE STATISTICS table_name;

Q: What is TempDB contention?
Ans: Performance issue when TempDB is overloaded.

Q: How to detect deadlocks?
Ans: Use SQL Profiler or Extended Events.

Q: How to resolve deadlocks?
Ans: Rewrite queries, add indexes, or change isolation levels.

Q: How to monitor disk I/O?
Ans: sys.dm_io_virtual_file_stats DMV.

Q: How to check SQL Server memory usage?
Ans: sys.dm_os_process_memory DMV.

Q: How to identify unused indexes?
Ans: sys.dm_db_index_usage_stats DMV.

Q: How to identify missing indexes?
Ans: sys.dm_db_missing_index_details DMV.

Q: How to check query execution time?
Ans: SET STATISTICS TIME ON;

Q: What is Parallelism?
Ans: Splitting query into multiple threads for faster execution.

Q: How to disable Parallelism?
Ans: Set MAXDOP option in query or server-level.

Q: What is Parameter Sniffing?
Ans: SQL uses cached plan, may cause performance issues.

4. Security & User Management (15 Q&A;)

Q: Authentication modes?
Ans: Windows & SQL Authentication.

Q: How to create login?
Ans: CREATE LOGIN user WITH PASSWORD='pass';

Q: How to create user?
Ans: CREATE USER db_user FOR LOGIN user;

Q: How to grant permissions?
Ans: GRANT SELECT ON table TO user;

Q: How to revoke permissions?
Ans: REVOKE SELECT ON table FROM user;

Q: Difference between Server Roles & DB Roles?
Ans: Server roles = instance-level, DB roles = database-level.

Q: How to reset SA password?
Ans: Use ALTER LOGIN sa WITH PASSWORD='newpass';

Q: How to check failed logins?
Ans: View SQL Server Error Logs.

Q: What is Transparent Data Encryption?
Ans: Encrypts DB at rest.

Q: How to list all logins?
Ans: SELECT * FROM sys.server_principals;

Q: How to list all users?
Ans: SELECT * FROM sys.database_principals;

Q: How to enable Mixed Mode Auth?
Ans: Change via SQL Server Properties → Security.

Q: How to create read-only user?
Ans: GRANT SELECT ONLY on DB objects.

Q: What is SQL Injection?
Ans: Malicious queries modifying DB data.

Q: How to prevent SQL Injection?
Ans: Use parameterized queries, validate input.

5. High Availability & Disaster Recovery (15 Q&A;)

Q: What is Log Shipping?
Ans: Backup → Copy → Restore logs to secondary server.

Q: What is Database Mirroring?
Ans: Real-time copy of database to another server.

Q: What is Always On?
Ans: High Availability feature with automatic failover.

Q: What is Replication?
Ans: Copies data between servers: Snapshot, Merge, Transactional.

Q: Log Shipping vs Mirroring?
Ans: Log Shipping = delayed sync, Mirroring = near real-time.

Q: Mirroring vs Always On?
Ans: Always On = multiple replicas, Mirroring = single mirror.

Q: What is a Failover Cluster?
Ans: Group of servers sharing storage for high availability.

Q: Synchronous vs Asynchronous?
Ans: Sync = no data loss, Async = minimal delay.

Q: How to check log shipping status?
Ans: Use msdb tables or SSMS reports.

Q: How to set up replication?
Ans: Use SSMS wizard or sp_addpublication.

Q: What is Recovery Point Objective (RPO)?
Ans: Max data loss acceptable.

Q: What is Recovery Time Objective (RTO)?
Ans: Time to restore services after failure.

Q: What is Always On Listener?
Ans: Single connection point for availability group.

Q: How to failover Always On?
Ans: Use SSMS or ALTER AVAILABILITY GROUP FAILOVER.

Q: How to test DR plan?
Ans: Simulate failover and restore scenarios.

6. Troubleshooting & Maintenance (15 Q&A;)

Q: How to find long-running queries?
Ans: sys.dm_exec_requests DMV.

Q: How to check SQL Server uptime?
Ans: SELECT sqlserver_start_time FROM sys.dm_os_sys_info;

Q: How to check SQL Server logs?
Ans: EXEC xp_readerrorlog;

Q: How to restart SQL Server Agent?
Ans: Use SQL Server Configuration Manager.

Q: How to fix TempDB full?
Ans: Increase size, add files, or free space.

Q: Transaction log full, fix?
Ans: Backup log or change recovery model temporarily.

Q: How to check database size?
Ans: sp_spaceused stored procedure.

Q: How to shrink DB?
Ans: DBCC SHRINKDATABASE(dbname);

Q: How to rebuild indexes?
Ans: ALTER INDEX ALL ON table REBUILD;

Q: How to repair DB?
Ans: DBCC CHECKDB WITH REPAIR_ALLOW_DATA_LOSS;

Q: How to identify failed jobs?
Ans: msdb..sysjobhistory DMV.

Q: How to troubleshoot high CPU?
Ans: Check sys.dm_exec_requests + query plans.

Q: How to troubleshoot high memory usage?
Ans: sys.dm_os_memory_clerks DMV.

Q: How to identify orphaned users?
Ans: sp_change_users_login report;

Q: How to fix orphaned users?
Ans: sp_change_users_login auto_fix.

7. T-SQL Commands & Queries (15 Q&A;)

Q: Find DB size?
Ans: EXEC sp_spaceused;

Q: List all indexes?
Ans: SELECT * FROM sys.indexes;

Q: Check active sessions?
Ans: sp_who2;

Q: Kill a session?
Ans: KILL ;

Q: List all triggers?
Ans: SELECT * FROM sys.triggers;

Q: Check free disk space?
Ans: EXEC master.dbo.xp_fixeddrives;

Q: List top 10 largest tables?
Ans: sp_spaceused or sys.dm_db_partition_stats;

Q: Check SQL Server uptime?
Ans: SELECT sqlserver_start_time FROM sys.dm_os_sys_info;

Q: Find duplicate rows?
Ans: Use GROUP BY HAVING COUNT(*)>1;

Q: Find missing indexes?
Ans: sys.dm_db_missing_index_details DMV;

Q: Find unused indexes?
Ans: sys.dm_db_index_usage_stats DMV;

Q: Find last executed queries?
Ans: sys.dm_exec_query_stats DMV;

Q: Find failed login attempts?
Ans: sys.event_log DMV;

Q: Find database growth history?
Ans: msdb..backupset + sys.master_files;

Q: List all open transactions?
Ans: DBCC OPENTRAN;

8. Scenario-Based Questions (15 Q&A;)

Q: DB in suspect mode?
Ans: Set EMERGENCY, run DBCC CHECKDB, restore if needed.

Q: Table deleted accidentally?
Ans: Restore from backup or use point-in-time recovery.

Q: Transaction log full?
Ans: Backup log or switch to Simple temporarily.

Q: High CPU usage?
Ans: Check sys.dm_exec_requests and query plans.

Q: Deadlocks increasing?
Ans: Use Extended Events or trace deadlock graph.

Q: Slow queries?
Ans: Check execution plan, missing indexes, and stats.

Q: Replication failed?
Ans: Check distribution agent logs, reinitialize.

Q: Always On failover failed?
Ans: Check cluster logs and WSFC status.

Q: Log shipping not syncing?
Ans: Check SQL Agent job history and msdb tables.

Q: TempDB contention?
Ans: Add multiple TempDB files to balance load.

Q: Database migration plan?
Ans: Backup-restore, compatibility check, update stats.

Q: Corrupted index?
Ans: Rebuild index, check DBCC CHECKDB.

Q: Database inaccessible?
Ans: Check permissions, logs, and restore if needed.

Q: Query timeout errors?
Ans: Check network, locks, or increase timeout.

Q: SSRS reports failing?
Ans: Check execution logs, data source config.