Microsoft SQL Server DBA Syllabus (2017 & 2019)

Module 1: Introduction to SQL Server

Different Editions of SQL Server
Tools of SQL Server (SSMS, Azure Data Studio)
Hardware and Software Requirements
Instances
- ➢ Default Instance
- ➢ Named Instances

SQL Server Services
- ➢ Instance Aware Services
- ➢ Instance Unaware Services

Module 2: Installation and configuring SQL Server

• Installing SQL Server 2017 & 2019.
- ➢ Pre – installation steps
- ➢ Installations
- ➢ Viewing installation process with LOG files
- ➢ Common issues.
- ➢ Adding /Removing components
- ➢ Installing service packs.
- ➢ Best Practices after Installing SQL Server

• Configuration
- ➢ Configuring various Services with Local and Domain Account
- ➢ Startup Parameter
- ➢ Configuring data file and log file paths
- ➢ Memory configuration
- ➢ Remote connections
- ➢ Configuring Network protocols, Ports

Module 3: Working with Databases

• Working with databases.
- ➢ System Defined databases
- ➢ Steps to move System databases
- ➢ Handling <mark>TempDb</mark> issues.
- ➢ Move TempDb file in different Drive

• Database Architecture.
- ➢ Data File & Log File
- ➢ Filegroups
- ➢ Extents
- ➢ Pages – types
- ➢ Page architecture
- ➢ Tracking free space
- ➢ <mark>Log file full</mark> – How to solve the problem

• Creating Databases

• Database Snapshots

• Adding files, file groups and Schema

Module 4: Implementing Security

• Security in SQL Server 2008
• Types of Authentications.

Windows Authentication
- ➢ Creating logins from windows users and groups
- ➢ Orphan logins.

SQL Server Authentication
- ➢ Creating SQL logins and testing logins

• Setting authentication Mode

• Security Auditing

• Understanding server roles

• Working with users

• Resolving orphan users' issues

• Understanding database roles, custom and application roles

• Understanding permissions

Module 5: Backup and Restoration

• Understanding Transaction process
• Understanding Transaction Log file
• Checkpoint & Lazy writer process
• Truncating log file.
• Database Recovery Models
  - ➤ Full
  - ➤ Bulk Logged
  - ➤ Simple

• Setting recovery model
• Database Backups
• Backup Types.
  - ➤ Full
  - ➤ Differential
  - ➤ Transaction Log
  - ➤ File or Filegroup
  - ➤ Partial Backup

• Copy-only, Mirrored and tail log backup
• Performing Restoration operations

Practical Scenario:
  - ➤ **How to Recover Database from Suspect mode.**
  - ➤ **How to Recover Database when Log file is Corrupted.**
  - ➤ **Rebuilding Master database**

Module 6:   Transparent Data Encryption (TDE)

  - ➤ What Is TDE
  - ➤ Step by Step Enabling TDE
  - ➤ Resorting TDE enabled database get Real time issue and Fixing
  - ➤ Disable TDE

Module 7: HA & DR

Introduction to High Availability

- **Working with Log Shipping**
  - ➢ Log Shipping Requirement
  - ➢ Configuring Log Shipping
  - ➢ Monitoring Log Shipping Status

➢ Manually performing Fail Over
➢ Transferring logins
➢ Log shipping tables and stored procedures
➢ Fixing log shipping issues

• **Working with Database Mirroring**
➢ Difference bet Log shipping and Mirroring
➢ Operating Modes in Mirroring
➢ Server Roles in Mirroring
➢ Requirements for Mirroring
➢ Configuring Mirroring
➢ Performing failover in Mirroring
➢ Different Ways to monitor Mirroring Status
➢ Mirroring system tables and stored procedures.
➢ Major issues with mirroring.

• **Working with Database Always On 2017**
➢ Difference bet Mirroring and Always on
➢ Server Roles in Always on
➢ Requirements for Always on
➢ Installation VM for Always on with Domain control, Firewall, User Account etc.
➢ Installation 3 VM for Always Setup Join all Node in Cluster
➢ Configuring Always on & failover in Always on

Module 8: Replication

• Replication and advantages

• Replication Entities

• Replication Architecture

• Replication Agents

• Types of Replications

• Configuring Replication
➢ Snapshot Replication
➢ Transactional Replication
➢ Merge Replication

• Peer to peer replication

• Replication Topologies

Module 9: Automating Administrative Tasks

• Working with Database Mail.

➢ Mail architecture.
➢ Configuring Profiles and Accounts
➢ Creating Operators
➢ Sending Mail

• Configuring linked servers

• Implementing Automation
➢ Configuring SQL Server Agent
➢ Creating Jobs
➢ Managing jobs and resolving errors.
➢ Monitoring jobs.
➢ Auto alert when jobs are enabled, disabled or failed.

• Managing replication.

• Monitoring and Tuning Replication

Module 9: Advanced Administration Concepts

 • Maintenance plans

• Monitoring and Tuning SQL Server
➢ Performance counters setup
➢ Measuring performance of server.
➢ Tuning queries.
➢ Tuning databases.
➢ Tuning physical architecture of databases.
➢ Using DTA.

• Monitoring Tools
➢ Performance Monitor
➢ SQL Server Profiler
➢ Database Engine Tuning Advisor.
➢ Dynamic Management Views.
➢ SQL Server and Windows Event Logs.

• Troubleshooting
➢ Physical server performance.
➢ Connectivity to SQL Server
➢ Database Performance.
➢ Using the DAC.

➢ Shrink Files
➢ Using DBCC commands.

Module 10: SQL Server Architecture

- SQL Server Architecture
  - ➢ Relational Engine
  - ➢ Storage Engine
  - ➢ Buffer pool
  - ➢ Managing execution plans.
- Locking and Blocking
  - ➢ Locks
  - ➢ Deadlocks
  - ➢ Understanding Blocking.
  - ➢ Terminating Processes
  - ➢ Transaction Isolation Levels.

Module 11: Index Management

- Why Indexes
- Type of Indexes
  - ➢ Cluster Index
  - ➢ Noncluster Index
  - ➢ Full Text Index
- Creating Indexes
- Manage Index Fragmentation
  - ➢ DBCC Showcontig
  - ➢ DM.DB_Index_Physical_Stats
  - ➢ Index Rebuilding and Reorganizing.

- Manage Statistics
- Performing database integrity checks

Module 12: SQL Server 2016/2017 to 2019 Upgrade Process

- ➢ Upgrade Type
    - o Inplace Upgrade
    - o Side By Side Upgrade
- ➢ Compatibility level
- ➢ Transferring logins
- ➢ Transferring Jobs