SQL School™

Quality Training Assured

MSBI Training Plans

	PLAN A	PLAN B	PLAN C
Course Includes	1.MSBI[IS, AS, RS]	1. T-SQL Basics 2. MSBI [IS, AS, RS]	1. T-SQL Basics 2. MSBI [IS, AS, RS] 3. Power BI
SQL: Database Basics, SQL Basics	X	✓	✓
T-SQL: SQL Server & T-SQL Queries	X	✓	✓
T-SQL: Queries, Sub Queries, Joins	X	✓	✓
T-SQL: Constraints, Group By, Merge	X	✓	✓
T-SQL: Data Modelling, Excel Pivots	X	✓	✓
MSBI: ETL & DWH Design in SSIS	✓	✓	✓
MSBI: SSAS Cube Design & OLAP	✓	✓	✓
MSBI: SSRS, Excel Pivot Reports	✓	✓	✓
MSBI: DAX Expressions & Queries	✓	✓	✓
MSBI: MSBI with Big Data (Azure)	✓	✓	✓
MSBI: MDX Queries, Cube Reports	✓	✓	✓
MSBI: End to End MSBI Project	✓	✓	✓
Power BI : Report Design, Visuals	X	X	✓
Power BI : Modelling, Power Query	X	X	✓
Power BI : DAX Queries, Expressions	X	X	✓
Power BI : Power BI Service (Cloud)	X	X	✓
Power BI : REST API, Excel Reports	X	X	✓
Power BI : Report Server Admin	X	X	✓
MSBI with Power BI Integration	X	X	✓
Total Course Duration	7 Weeks	9.5 Weeks	13.5 Weeks

Module 1: Basics, SQL Server & T-SQL Concepts (For MSBI Plans B, C)

Chapter 1: SQL SERVER INTRODUCTION

Data, Databases and RDBMS Software; Database Types : OLTP, DWH, OLAP; Microsoft SQL Server Advantages, Use; Versions and Editions of SQL Server; SQL : Purpose, Real-time Usage Options; SQL Versus Microsoft T-SQL [MSSQL]; Microsoft SQL Server - Career Options; Database Engine Component and OLTP; BI Components, Data Science Components; ETL, MSBI and Power BI Components; Course Plan, Resume, Project; 24 x 7 Lab; Software Installation Pre-Requisites;

Chapter 2: SQL SERVER INSTALLATIONS

System Configuration Checker Tool; Versions and Editions of SQL Server; SQL Server Pre-requisites : S/W, H/W; SQL Server 2016 / 2017 Installation; SQL Server 2019 Installation; Instance Name; Instances : Types; Default Instance, Named Instances; Port Numbers; Service and Service Account; Authentication Modes and Logins; FileStream, Collation Properties;

Chapter 3: SSMS Tool, SQL BASICS - 1

SQL Server Management Studio; Local and Remote Connections; System Databases: Master and Model; MSDB, TempDB, Resource Databases; Creating Databases : Files [MDF, LDF]; Creating Tables in GUI; Data Insertion & Storage; SQL : Real-time Usage; DDL, DML, SELECT, DCL and TCL Statements; Data Storage, Inserts - Basic Level; SELECT; Table Data Retrieval;

Chapter 4: SQL BASICS - 2

Creating Databases & Tables in SSMS; Single Row Inserts, Multi Row Inserts; Rules for Data Insertion Statements; SELECT Statement @ Data Retrieval; SELECT with WHERE Conditions; AND and OR; IN and NOT IN; Between, Not Between; LIKE and NOT LIKE; UPDATE Statement; DELETE & TRUNCATE; Logged and Non-Logged Operations; ADD, ALTER and DROP Statements;

Chapter 5: SQL BASICS - 3, T-SQL Introduction

Schemas : Group Tables in Database; Using Schemas for Table Creation; Using Schemas in Table Relations; Table Migrations across Schemas; Default Schema : "dbo"; Import and Export Wizard; Bulk Operations; Excel File Imports / Exports; SQL Server Native Client; Executing SSIS Packages, Data Loads; Local and Global Temporary Tables; # & ## Prefix; Temporary Vs Permanent Tables;

Chapter 6: CONSTRAINTS & INDEXES BASICS

Constraints and Keys - Data Integrity; NULL, NOT NULL Property on Tables; UNIQUE KEY Constraint; PRIMARY KEY Constraint; FOREIGN KEY Constraint, References; CHECK Constraint; DEFAULT Constraint; Identity Property : Seed & Increment; Database Diagrams and ER Models; Indexes : Basic Types and Creation; Clustered and Non Clustered Indexes; Primary Key and Unique Key Indexes;

Chapter 7: JOINS and TSQL Queries : Level 1

JOINS; INNER JOINS For Matching Data; OUTER JOINS For (non) Match Data; Left Outer Joins; Right Outer Joins; FULL Outer Joins; One-way & Two Way Comparisons; "ON" Conditions; NULL, IS NULL; CROSS JOIN and CROSS APPLY; Join Options: Merge, Loop and Hash Joins;

Chapter 8: GROUP BY, T-SQL Queries : Level 2

GROUP BY Queries and Aggregations; Group By Queries with Having Clause & Where Clause; WHERE and HAVING in T-SQL; Rollup : T-SQL Queries; Cube : Usage and T-SQL Queries; UNION and UNION ALL; EXISTS; Sub Queries; Joins with Group By Queries; Nested Sub Queries; UNION and UNION ALL; Nested Sub Queries with Group By, Joins; Comparing WHERE, HAVING Conditions;

Chapter 9: JOINS & T-SQL Queries : Level 3

GetDate, Year, Month, Chapter Functions; Date & Time Styles, Data Formatting; DateAdd and DateDiff Functions; Cast and, Convert Functions in Queries; String Functions: SubString, Relicate; Len, Upper, Lower, Left and Right; LTrim, RTrim, CharIndex Functions; MERGE Statement - Comparing Tables; WHEN MATCHED and NOT MATCHED; IIF() Function for Value Compares; CASE Statement : WHEN, ELSE, END; ROW_NUMBER() and RANK() Queries; Dense Rank and Partition By;

Chapter 10: VIEW, PROCEDURE, FUNCTION BASICS

Views : Types, Usage in Real-time; System Predefined Views and Audits; Listing Databases, Tables, Schemas; Functions : Types, Usage in Real-time; System Predefined Functions, Audits; DBId, DBName, ObjectID, ObjectName; Variables & Parameters; System Predefined Procedures; Parameters; Sp_help, Sp_helpdb and sp_helptext; sp_pkeys, sp_rename and sp_help;

Chapter 11: TRIGGERS & TRANSACTIONS

Triggers Real-world Usage; FOR/AFTER Triggers; INSTEAD OF Triggers; INSERTED, DELETED Memory Tables; DML Automations using Memory Tables; Read Only Tables; Enable Triggers and Disable Triggers; ACID Properties; Auto Commit; EXPLICIT & IMPLICIT; COMMIT and ROLLBACK; Open Transactions; Query Blocking Scenarios @ Real-time; NOLOCK and READPAST Lock Hints;

Chapter 12: ER MODELS, NORMAL FORMS

Normal Forms for Entity Relationships; First, Second, Third Normal Forms Usage; Boycee-Codd Normal Form: BNCF : Usage; 4 NF, EKNF, ETNF. Functional Dependency; Multi-Valued, Transitive Dependencies; Composite Keys and Composite Indexes; 1:1, 1:M, M:1, M:M Relationship Types; SQL Queries Access in Reporting Tools; Office Data Connection Files; Excel Pivot Reports; SQL Queries in BI Tools; FETCH OFFSET, NEXT ROWS; Data Refresh (Manual, Automated);

REAL-TIME CASE STUDY - 2(Sales & Retail), EXCEL INTEGRATION

Module 2: SQL Server Integration Services (SSIS)

{For MSBI All Plans}

Chapter 1: SSIS INTRODUCTION & INSTALLATION

Need for SQL Server Integration Services (SSIS) & ETL / DWH; Advantages of SSIS for Data Loads, Operations, ETL, Warehouse; SSIS Tools : SSDT (SQL Server Data Tools), ETL Wizards; SSIS Design / Development and LIVE (Deployment) Environment; Understanding Data Warehouse (DWH) Design and ETL Process; DWH and ETL Structures, Implementations with MSBI SSIS; SSIS ETL Operations for Data Reads, Data Cleansing, DWH; Data Warehouse (DWH) Design Principles and Design Plan; SSIS 2019 and 2017 : SSIS Installations, Database Catalog Folders; SSDT Installation; Basic Vocabulary - SSIS, ETL, DWH, Data Flow, Data Buffer; SSIS Package Environment and Project Creation; SSIS Project Templates - Verifications; Version Control and Tools Usage;

Chapter 2: SSIS ETL PACKAGES: EXTRACT, TRANSFORM, LOAD

Control Flow Tasks - Architecture, Purpose and Usage; Data Flow Tasks - Architecture, Purpose and Usage; Creating SSIS Packages For Basic Data Flow Operations; SSIS Solutions, Projects and Package Creation. Tasks; Need For Data Pipelines & Connections in Data Flow Tasks; Understanding SSIS Package (Program) Execution Process; Working with Data Flow Objects and Tasks in SSIS; Using OLE DB and SQL Server Connections -

Usage; SSIS Package Creation Process - Using Control Flow Items; Using DTSX Files for SSIS Package Execution. Audits; SSIS Execution Context, SSIS Package Errors and Logs; Data Flow Transformation: Conditional Split, Expressions; Excel Connections, Sheets, & Memory References - Usage; Using Source Assistants, Destination Assistants @ SSIS;DAT File Imports, Data Flow Options, Adding Annotations; SSIS Project Configuration - Debugging, Bit Config; SSIS 64 Bit and 32 Bit Configuration Settings and Options;

Chapter 3: MERGE, FUZZY LOOKUP, DATA CONVERSION

MERGE Transformation and UNION ALL Transformation; SORT Transformation, NOSORT Options, Advanced Sort; Synchronous & Asynchronous Transformations, Data Loads; Row and Partial Blocking Transformations. Buffer Reuse; Fully Blocking Transformations - Buffer Reuse Restrictions; Examples to Avoid Fully Blocking Transformation in SSIS; Bulk Load Operations and Data Import Options in SSIS; IsSorted and SortKey Positions with Advanced Options; SSIS performance & Resource; Data Conversion Transformation and SSIS Expressions; Fuzzy Lookup Transformation, Reference Table Connections; Exact, Fuzzy & Nomatch Data Cleansing with Conditional Split; Index Creation, Maintenance for Faster Lookup Transformation; Derived Columns; NVARHAR, VARCHAR Data; Threshold Values Selection, Search Delimiters and Options; Data Pipeline with _Similarity, _Confidence. Explicit Data Type Conversions and Usage. Error Redirections;

Chapter 4: PACKAGE PROPERTIES, CHECKPOINT, PIVOT

Execute SQL Task and OLE DB Queries; Transaction Options For SSIS Executables - Package Level; Precedence Constraints - Success / Failure / Completion; SSIS Package Level Rollbacks and Restart Execution Options; SSIS Checkpoints - Purpose and Usage with Data Flow Tasks; Checkpoint Files and SSIS Logging Options - Package, Tasks; Transactions with Checkpoint File Usage in SSIS Packages; Checkpoint Options; FailPackageOnFailure and Checkpoint; Transaction Property : REQUIRED / SUPPORT, NOTSUPPORTED; Importing Legacy Data, Data Cleansing, Formatting; PIVOT Transformation, Data Reads, Connection Assistant; Pivot Usage, Key Values; Lineage ID in SSIS. Data Mappings; Lineage IDs for Column Mapping and Pivot Keys; Data Viewer (Debugging) for Data Transfer; Explicit Data Type Conversions. Error Redirections;

Chapter 5: SSIS with ETL & DWH. SCD TYPE 1, TYPE 2

Validation Events, Execution Events; Pre-Execution, Progress and Cleanup Events in SSIS; Auditing SSIS Events, Errors / Warnings / Information; Configuring and Using sysssislog System Tables; Package Debugging : Data Viewers & Breakpoints; For Each Loop Container. File Connections, Variables; Defining Variables for Connections. DFT, Control Flow Links; Dynamic Connections with Variables. Connection Strings; Connection Iterations, Connection Fetch, Index Mapping; SSIS Expressions and Usage for ETL and DWH; FOR LOOP Expressions in SSIS; InitExpression, EvalExpression, AssignExpression; SSIS Expression Builder, Functions, Evaluated Values; Data Insertions and Data Serializations with SSIS; Counter Values, Variables and Parameter Mapping; SSIS for OS Drive Operations, Loops; Using Execute SQL Task : Variables, Return Values;

Chapter 6: DATAWAREHOUSE (DWH) DESIGN WITH SSIS

Introduction to Data Warehouse (DWH) - Purpose, Usage, Access; Technical Terms: Dimensions, Attributes, Members and Types; Dimension Tables, Fact Tables and Relations, Inferred Members; TYPE1 and TYPE2 Changes. ETL Implementation Techniques; Implementing Type I Changes (SCD) for DWH : Sales Scenario; Dimensional Table Design for DWH using SCD - Type 1, Type 2; Initial Data Loads with Legacy Files (DAT, TXT, CSV), Data Marts; Working with Business Keys & non Identity Key Based Columns; Surrogate Keys and Alternate Business Keys - Purpose, Usage; Identity Columns, Key Values in DWH. Business Key Limitations; Cascading Source OLTP / Stage Changes to DWH Inactive Rows; Changes to Fixed Attributes, Changing

Attributes. Observations; Changes to Historical Attributes. Inferred Member Updated; ETL Date Fields, Row Status Values and Transformations; Designing Dimensions for DW - Incremental, Historical Loads; Historical Attributes, Data Delta Operations, Identification; SSIS SCD Transformation Limitations and Real-time Issues;

Chapter Ch 7: CHECKSUM TRANSFORMATION, DWH DESIGN

Checksum Transformation : 2019, 2017 Versions; Parity Checks (CRC) Codes; Working with CHECKSUM Transformation & Parity Bit Columns; Generating Checksum Values For Type I, Type II ETL Changes; DWH Dimension Tables With Checksum Transformation; Parity Bits, Conditional Lookup Transformation; Row Redirection & Lookup Match, NonMatch Output; OLE DB Command: SQL Statements; Parameter Mapping and Row Updates; Memory Loads, CAW Files (VM); Memory Connections and Reuse. Lookup with Cache; Tuning Lookup Transformation: FULL CACHE and PARTIAL CACHE. Cache Connection Manager; Pre-ETL Data Load with Memory Connections; Lookup with NOCACHE. Dependent Data Flow Tasks; Post ETL, Derived Column and Fuzzy Transformations; Internal Parameters; OLEDB Command with Conditional Splits;

Chapter 8: CHANGE DATA CAPTURE: DWH DIMENSIONS

Understanding CDC Tables with SQL Server Connections; DML Audits: Inserts, Deletes, Values before/after Updates; CDC Source Connections - Usage, ADO.NET Integration; CDC Control Flow Tasks and CDC State Tasks. Values; INITIAL LOAD START / END. PRCESSING RANGE; Using State Variables and Controls. Storing States; CDC Source with Net Support Changes; SSIS CDC Control Tasks and Caching, State Variables; Understanding State Variables and SSIS Logging Tables; Initial and Incremental Loads with CDC; Dynamic CDC Connections, Parameter Mapping; Integrating Control Flow and Data Flow for CDC @ ETL; CDC Splitter Transformation - Row Inserts and Updates; Master Packages and Child Packages, Derived Columns; Defining Local and Global Variables/Parameters; Parameter Bindings with Parent - Child Packages;

Chapter 9: FACT TABLE DESIGN, FACT LOADS (DWH)

Fact Table - Design and Implementation Rules, ER Model; Fact Table Design with STAR and SNOWFLAKE Schemas; Time Dimensions - Purpose, Usage and ETL Date / Time; Generating Time Dimensions for ETL, Load Identification; Parent-Child Packages for Dimensional Loads, Control Flow; Parent-Child Packages for Dimensions & Fact Table Loads; Master Package Design: Dimension, Fact Load Integration; Inferred Members and Status for NULLs in Dimensions; Parameter Mapping @ ETL Updates, Component Properties; ETL Load Date IDs & Expressions for Dimension Keys; Error Handling & Event Handling with Master Packages; Text Qualifiers and Parameters in Master-Child Packages; Key Based Dimension LOOKUPs and Indexes. Fast Loads; SCD Implementations with Legacy Data. ETL Load Types; Fact Load Design for Initial Loads, Incremental Updates; End-to-End Data Warehouse Design: Implementation; Direct Data Loads and Data Stage Operations for DWH DBs; STAR & SNOWFLAKE Schemas for DWH - Data Modelling;

Chapter 10: DWH MIGRATIONS with SSIS, SCRIPT Task

Data Warehouse Migrations with SSIS Control Flow; Using SSIS Containers and Db Integrity Task; Using Pre-Database Migration Tasks, Precautions; Transfer Database Task and DB File Options; Online and Offline DB Transfer Options, Usage; Copy / Move Options with DWH Migrations; SMTP : Simple Mail Transfer Protocol For Emails; Using SQL Server Agent Operators, Package Events; Precedence Constraint with Containers, SSIS Tasks; Using Data Profiling Task with ADO.NET Connectors; XML Files Generation, Using SSIS Data Profiler Tool; Script Task - Purpose and Working in SSIS Control Flow; Script Task - Usage with VB.NET Programs. Compilations; Variables and Parameters with SSIS Script Task. Usage; Read Only and Read Write Variables. Expressions, Mapping; Data Flow Limitations : Solutions with .NET Scripting; SSIS Expressions and Package

Debugging, Break Points; SSIS Variables and Parameters - Mapping Expressions; Using Control Flow File System Tasks and Limitations; SQLDataAdapters & System.Data.SQLClient Connections;

Chapter 11: SSIS PROJECT DEPLOYMENT, UPGRADES

SSISDB Catalog Deployments - Process & ISPAC Files; SSIS Package Builds, Verification Techniques, Scripts; SSIS Project Deployment Wizard : Targets and Logging; SSIS DB Catalog Folders - Creation, Usage. Properties; SSIS DB Catalog Projects - Creation, Usage. Properties; SSIS Package Executions - Scripts, Reports, Messages; Package Validations - Scripts, Reports, 32/64 bit Options; Package Configurations - Parameter Management, Scripts; SSIS Package Jobs @ SQL Server Agent. SSIS Job Steps; SSIS Job Schedules and Notifications: Windows Event Logs; Package Security Management - SSISDB Logins and Users; Folder Level and Project Level Security Implementation; Project Migration Utilities and Package Upgrades; SSIS Package Imports and Exports with ISPAC Files; Command-Line Deployments For SSIS, Execution Utilities; SSIS Package Execution Reports; Validation Reports; SSIS Package Versions and Restores, SSIS Rollbacks;

Chapter 12: SSIS PROJECT [E-Commerce Domain]

SSIS ETL & DWH with STAR Schema; SSIS ETL & DWH with SNOWFLAKE Schema; Dimension Table Design & Business Keys; Fact Table Design & Data Integrity; Incremental Data Loads with Containers; Key Lookup and Business Key Identification; Staging Tables, Master - Child Packages; SSIS Package Deployment [Catalog Deployments]; SSIS Training : Project Specifications; Project Explanation and Solution; Project FAQs and Resume Support; Chapter Wise FAQs and Answers; Concept Wise Tasks and Solutions; SSIS DWH Databases with Reports; Technical Resume Points in SSIS; End to End Implementation [MSBI];

Module 3: SQL Server Analysis Services (SSAS)

{For MSBI All Plans}

Chapter 1: INTRODUCTION TO SSAS & CONFIGURATION

Installation and Configuration of SSAS; SSAS Component & Tools - Operational Modes; Multidimensional Mode : Properties & Usage; Tabular Mode : Purpose, Properties and Usage (ROLAP); PowerPivot Mode : Properties and Usage (Overview); Multidimensional Mode Instances, Verification; SSAS Service Accounts & Usage. SQL Browser Service; SSDT Tool: SQL Server Data Tools - SSDT / Visual Studio; Understanding Developer Environment (SSDT) Interface; SSAS Online Training - Lab Plan, Resources & Databases; Need for OLAP Databases and Cubes For Analysis - OLAP; Need for MDX : Multidimensional Expression Language; Need for DAX : Data Analysis Expression Language; Need for XMLA and DMX Environments. SSAS Architecture; SSAS Workflow in Real-world. Data Source Configurations & DB Installations for Lab;

Chapter 2: BASIC CUBE DESIGN WITH SSAS, EXCEL PIVOT

Basic Cube Design with SSDT (SQL Server Data Tools); SSAS OLAP Entities : Data Source, Data Source View; Cube Design Concepts : Measure Groups, Measures; Identifying Dimensions, Attributes and Members; Basic Cube Design : DS, DSV, Cube Wizard, Dimensions; Adding Attributes. SSAS Deployment and Cube Access; PROCESS of OLAP Cube. Options and Online Deployment; Cube Browsing (Basic Level) using SSMS & SSDT Tools; Excel Connections for SSAS Databases & OLAP Cube Access; Excel PIVOT Tables and Basic Chart Report Design in SSAS; Piechart Reports and Attribute Filters. Usage Statistics; Common Deployment Errors : Logon Failures @ OLAP Server; OLAP Server Impersonation Account - NT ATHORITY Account; OLAP Deployment Warnings and Solutions. Precautions; End to End Implementation of SSAS - Basic Example;

Chapter 3: HIERARCHIES, MDX - LEVEL 1

Working with Data Source Views (DSV) : Named Calculations; Named Queries & Dimension Attributes. Explore Data in DSV; Basic Dimension Types : Database Dimension @ Entity Level; Cube Dimension Based on Entity Relations in DSV; Creating Hierarchies in Multidimensional Cube : Purpose; Grouping Attributes within Database Dimensions; Testing Hierarchies in Cube Browser : SSMS, SSDT Tools; MDX: Multidimensional Expression Language. Syntax Rules; MDX Queries Syntax and MDX Expressions Syntax; MDX Syntax and Axis Models. Cube Data into Rows, Columns; Practical Advantages of MDX: Reports, Cube Writebacks; MDX Queries with Dimension Attributes, Members. Axis; MDX Queries on Hierarchies, Levels and Attribute Keys; MEMBERS, CHILDREN, ALL MEMBERS - Cube Aggregates; SELECT in MDX with CROSSJOIN Examples;

Chapter 4: CALCULATIONS, MDX - LEVEL 2

MDX Queries with WHERE, EXCEPT, RANGE, Operators; NONEMPTY, Multiple Member Values. Limitations @ WHERE; PARENT and CHILDREN with MDX Hierarchies. Tuple Inverse; MDX ORDER, TOPCOUNT / HEAD, BOTTOMCOUNT/ TAIL; FILTERS in MDX - CURRENT MEMBER, EMPTY MEMBER; FILTER Expressions with AND / OR and LEFT / RIGHT Range; MDX Query Batches - GO Statement and Query Separator; ADOMD Client : MDX Query Processing and Real-time Use; MDX Calculations - Creation and Scope of Usage; Calculations with MDX Expressions: Measure Level; Calculations with MDX Expressions: Attribute Level; Time Based Calculations with MDX Scripts in Cube; TIME DIMENSIONS - Purpose and Advantages, Properties; Time Keys and Time Attributes - Calendar / Fiscal / ISO; BI Enhancements (Cube) : Advantage; Identifying Attributes, Hierarchies For Time Enhancements; Testing Time Intelligence : YoY, YTD, QTD, MTD, etc..

Chapter 5: PARTITIONS, AGGREGATIONS, PERSPECTIVES

Partitions: Purpose and Architecture, Tuning Operations; Cube Partitions : Storage, Slice Options. Query Conditions; Query Binding and Table Binding Options in Partition Design; Aggregations - Purpose and Usage. Predefined Calculations; Aggregation Types: Full, Default, None and Unrestricted; Measure Properties and Default Aggregation Types in OLAP; Linking Aggregations and Partitions. Cube Slicing Options; Additive and Semi-Additive Measures - Aggregation Options; Storage Modes : Multidimensional, Relational and Hybrid; Aggregation Storage & Measure Group Storage: MOLAP/ROLAP; MOLAP - Automatic Processing, Scheduled, Medium Latency; Low Latency Processing and Custom Scheduling Options; Proactive Caching Options and Silence / Override Interval; Cache Rebuild & Overwrite Options. Processing with Partitions; Perspectives - Purpose and Scenarios For Invalid Cube Access; Dimension Usage Tab for Dimension Relations. End User Access; Translations : Creation and Real-time Use. Language Settings

Chapter 6: KPIs, OLAP CUBE DEPLOYMENTS

Key Performance Indicators (KPI) - Purpose, Design Options; MDX Calculations for GOAL, VALUE, STATUS & TREND; Variance and Value Computations. Format Options, Scope; KPI Organizer, Calculations. MDX Expressions, Time Analysis; FORMAT_STRING, MDX Expressions and Member Operators; MEMBER Names and SOLVE_ORDER Expressions in MDX; Parent KPIs with Member Hierarchies, KPI Browser Options; KPIs for Drill-Up, Drill-Down in MS Excel. Pivot Tables; SSAS Deployment Wizard : BUILD and Configuration Files; Deployment Options, Settings, Targets: Transaction Settings; SSAS Deployment Wizard Usage: Impersonation Settings; SSAS Deployment Accounts and Passwords. Security Inherit; OLAP Cube Security Roles and Partition Settings (MOLAP); Key Error Logs, Custom Storage and Error Locations; Scripting Deployment Procedure. Executing of XMLA Scripts; OLAP Database Processing Options - Full, Default, None

Chapter 7: TABULAR MODE INSTALLATION, CUBE DESIGN

SSAS Tabular Mode : Purpose, Scope of Real-time Usage; SSAS Tabular Mode Server Installation, Mode Verification; Tabular Mode Server and Database Architecture; Tabular Mode Advantages with Data Sources,

Cube Design; Tabular Mode Design : SSDT, Power Query, DAX; Purpose of Power Query and DAX for OLAP Cube Design; In-Memory Vertipaq Storage - Performance Advantages; BISM : Business Intelligence Semantic Model; Tabular Mode Cubes : Developing Data Models (SMDL); Workspace Servers : Integrated and Dedicated Modes; Comparing Workspace Server and Integrated Options; Compatibility Levels; Cube Design with SQL Server Databases : Data Imports; Workflow Operations with Tabular Mode Cube Design; Data Sources, SSDT and Tabular Cube Design; SSAS OLAP Environment and Cube Report Entities

Chapter 8: TABULAR MODE CUBE DESIGN, DAX - 1

Cube Design with SQL Server Databases: Data Imports; Identifying Tables, Dimensions, Attributes and Members; Designing Measure Groups, Aggregated Measures; Grid Formats and Diagram Formats. Process Options; BUILD and DEPLOY Options with Integrated Workspace; Cube Browsing with "Analyze in Excel" Options, Reports; Tabular Mode Cube Design : Creating, Using Hierarchies; DAX UI & Data Types; DAX Usage : DAX Queries & DAX Expressions; DAX Aggregated Measures with DAX, DAX Syntax; Hierarchies in Cube Design : Adding Levels; Relationship Edits : Active, Inactive Relations; Tabular Mode Cube Redesign with Import Templates; Model Options : Process, Calculate; Data Load Verifications, Tabular Mode Explorer;

Chapter 9: TABULAR MODE - DAX - 2

KPIs (Key Performance Indicators) Real-time Use; Partitions in Tabular Mode Cube Design; Using Power Query for Partition Design; Power Query Expressions and Data Filters; Import Data Options and ETL Operations; ; Defining Measures with DAX Expressions; Defining Perspectives for Cube Access; Data Expression Language (DAX) Basics; DAX Usage : Columns and Measures in SSAS; Auto generated Expressions in DAX; Member Representations; DAX Functions, Expressions; Standard Functions, Time Intelligence Functions; DAX FILTER() and CALCULATE() Operations; Time Dimension and YTD(), QTD(), MTD();

Chapter 10: OLAP DATABASE MANAGEMENT

OLAP DB Backups & Restores - Multidimensional, Tabular; Detach and Attach; OLAP Database Processing and XMLA Scripts; Cube Processing Jobs with DB Engine Agent; OLAP Database Scripting with XMLA, Cloning; OLAP Database Security Roles - MDX, DAX; Partition Management - Split and Merge; OLAP Cube Audits, Usage Based Optimization; OLAP Cube Writebacks. Cube Updates with MDX; Tabular Mode Cube Processing Options; Direct Query & In Memory with Direct Query; In-Memory Options with Direct Query in OLAP; Data Mining - Decision Trees, Clustering Alg"; Training, Testing Sets. Lift Charts, DMX Queries; Dimension Types : Fact, Role Playing, Degenerate; Multidimensional - Tabular Mode Comparisons;

Chapter 11: SSAS Project Work For Resume, Job Work

Module 4: SQL Server Reporting Services (SSRS)

{For MSBI All Plans}

Chapter 1: SSRS INSTALLATION, CONFIGURATION

Reporting Operations and Report Types; Paginated Reports and Interactive Reports; Analytical Reports and Mobile Reports; Need For Reporting Solutions (SSRS) and Tools; Reporting Engine Architecture and Report Databases; SRS Report Server Installation Process; Report Databases in SSRS and Real-time Usage; Web Service URL : Purpose, Test Connection, Usage; Web Portal URL - Purpose, Test Connection, Usage; Report Server Database and Report TempDB Configuration; SSRS Tools : SQL Server Data Tools (SSDT); Report Builder and Mobile Report Publisher; Report Design & Work Flow - Lab Plan, Data Sources; Three-Phase Report Life Cycle in Reports (End-End); Report Builder Versus Report Designer : Basics; Report Server and Web Service Integration

Chapter 2: BASIC REPORT DESIGN

Working with Visual Studio - SQL Server Data Tools; Report Templates and Basic Usage. Project, Solution; Designing Basic Reports - Understanding Entities; Working with Report Project Wizard - Usage, Reports; Defining Data Source Connections, Source Databases; Query Designer Options, Query Builder & Import Options; Table Reports and Matrix Reports with Report Wizard; Layout and Format Options - Drilldown Reports, Blocks; Stepped Reports and Multi Field Drilldown Options; Report Project Template - Designing Dataset, Reports; Report Toolbox and Report Data Options, Textbox Usage; Table Headers, Formatting Options, MATH Expressions; Alternate Row Colors, Using Report Globals, Expressions; Report Formatting Styles, Expressions and Reusability; Reporting Functions: IIF, Format, Ceiling, Round, Concat; Alternate Row Colors and Dynamic Formatting Options; Textbox Properties - Date & Time Formats, Numbers, Styles; Report Timeout Options and Tool Box Options, Report Data; Initial Catalog For Report Sources, Static/Dynamic Properties;

Chapter 3: GROUPING, PARAMETERS

Grouping Operations: Row Groups, Column Groups; Table Report - Row Groups, Parent - Child Groups; Adding Groups to Existing Rows and New Rows; Group Headers and Group Footers, Sub Totals; Group Field Visibility and Toggle Options @ Parent; Row Group Properties, Header/Footer Properties; Column Groups for Table Reports, Advanced Options; Drill-down Reports using Row Groups and Visibility; Column Groups - Advance Mode - Fixed Attributes, Fields; Repeating Header on Every Page & Repeat Page Options; Creating Parameters with Dataset Query Conditions; Single Value and Multi Value Parameters; Dynamic Parameters, Dependency, Queries; Defining Datasets with Parameters, Dynamic Conditions; Dataset Links to Parameters, Value Options from List, Query; Multi-Value Parameter: Data Types, Null, Empty Values; Reports using Multiple Data Sets. Performance Issues; SSRS Expressions and Global Fields For Report Parameters; Advanced: Auto Refresh, Manual Refresh Options;

Chapter 4: CHART REPORTS, DASHBOARDS, FITLERS

Chart Reports - Design Options, Properties and Usage; Series Values Selection - with / without Category Groups; Report Categories with Series Groups - Differences, Usage; Data Visualization Types: Trend & Discrete Chart Reports; Clustered / Non Clustered Legend Attributes. Position Options; Series Labels : Properties, Number Formatting Options, Visibility; Series Actions : Series Properties, Multi - Valued Parameters; Report Actions : URL / Reports, Setting for Report Filters; Dashboard Creations, Usage. Multiple Chart Areas, Legends; Dashboard Exports with Filters (Static, Parameterized); Chart Series, Report Markers Chart Areas & Limitations; 3-Dimensional Report Options - Properties, Visibility; Range & Pie Charts, Line Reports, Data Bars, Area Charts; Report Actions with Parameter Values - Report Filter Joins; Dataset Filters, Toolbox Filters and Bookmarks Usage; Filters versus Parameters - Differences with Performance; Filter Condition at Dataset Level, Toolbox Level;

Chapter 5: SSRS EXPRESSIONS, SHARED DATASETS

Defining Shared Data Sources and Shared DataSets ; Date and Time Expressions; FORMAT Function in SSRS, Date Parameters; Data Type Conversions and Integer / String Types; String Functions and Page Breaks in SSRS; LOOKUP Function and Dataset Joins; Field Value Replacement with Datasets; Using LIST Item from SSRS Toolbox; Field Expressions and Field Properties; #VALX, #VALY, #PERCENT, #SERIES Label Properties; #LABEL, #AXISLABEL, #TOTAL, #LEGENDTEXT; 3D Pie Charts, Funnel and Tree Map Reports; 3D Funnel and Sunburst Reports. Shape Charts; Doughnut, Pyramid and 3D Pyramid; Gauge Reports - Filters; Indicator Reports : Value State Expressions; SSRS Expressions - Custom Functions;

Chapter 6: REPORT BUILDER REPORTS & GAUGE REPORTS

Report Builder Tool Installation & Real-time Use; Differences with Report Designer Tool, Limitations; Data Source and DataSet Creation with Report Builder; Local Report Specific Entities and RDL File Creations; Entity Browsing and Query Design; Dataset Design with Parameters and Filters; Query Designer with Report Builder, Table Selection; Column Aggregates and Auto Group BY. Query Edit; Adhoc Reports with Drill-down and Column Groups; Dynamic Row Colors and Report Expression; Gauge Reports: Purpose, End User Access; Report Types - Radial and Linear Gauges; Adding Data to Gauge Report – Indicators; Gauge Data Versus Chart Data – Pointers; Maximum, Minimum Scale Range Values; Browser Compatibility and Offline Reports; Gauge, Gauge Panel Properties and Filters; Scale - Properties, Values, Label Options; Pointers, Scale Limits and Format Options; Ranges and Labels, Items, Needle; Adding Multiple Gauges - Dashboard Design; Parameterized Gauge Reports and Datasets;

Chapter 7: REPORT BUILDER REPORTS & MAP REPORTS

Map Reports - Map Layers, Map Report Items and Options; Map Gallery, ESRI Share Files and SQL Server Spatial data; Defining Geo Spatial Data for Business Analysis Dashboards; Working with Polygon, Tile, Line and Point Map Layers; Map Visualization Options and Bubble Map Reports; Data Fields, Display Labels and Visualization Indicators; Fields to Visualize, Color Rules and Display Labels; Editing Report Builder Reports in Report Designer; SSRS Deployment for Report Designer Reports; SSRS Deployment for Report Builder Reports; Report Deployment - Builds and Config Files; Webservice URL and Webportal URL Access; Data Source, Data Set Folders and Report URL; Report Deployment of Shared Data Sources; Report Deployment of Shared Datasets; Report Manager Uploads for RDL Files;

Chapter 8: REPORT MANAGEMENT

Data Source Management Options, Subscriptions; Dependant Items and Security Operations; Editing Shared Data Sources in Web Portal; Shared Data Source Operations: Enable, Hide; Connection Types, Connection Edits, Security; Shared Dataset Operations: Report Builder Edits; Data Preview, Data Loads and Dependant Items; Report Downloads & Uploads, Linked Reports; Security Management: Browser Role, User Access; Content Management, My Reports, Publisher; Report Builder, Uploads; Report Tuning: Caching, Rebuilds and Refresh; Report Tuning: Report Snapshots and Schedules; Subscriptions: Standard and Data Driven; Email and File share Subscriptions; Schedules and Report Delivery; Shared Schedules; Report Timeout, Report Parts and Publish; Sub Reports and Report Parts in Report Builder;

Chapter 9: MOBILE, KPI, CUBE REPORTS

Mobile Reports : Creation & Usage; Excel and Report Server Sources; Working with Mobile Report Publisher; Report Elements and Design Option; Layout: Master, Tablet and Phone; Grids and Color Palette. Deployment; RSMobile Formats: Uploads, Downloads; KPI Reports: Design from Web Portal; Shared Dataset in Report Builder Tool; KPI: Value, Goal, Status, Trend; KPI Visuals: Bar, Line, Step, Area; KPI Report Uploads to Webportal; KPI Link to Custom URL, Mobile Reports; KPI Reports : Real-time Limitations; SSRS Reports with SSAS OLAP Cubes; SSRS Cube Reports with MDX Queries; SSRS Cube Reports with DAX Queries; SSRS Cube Reports with MSBI SSAS MDX Parameters;

Chapter 10: SSRS Project Work For Resume, Job Work

Module 5: Power BI (Reports, Cloud, Server)

{For MSBI Plan C}

Chapter 1 : POWER BI BASICS

Power BI Job Roles in Real-time; Power BI Data Analyst Job Roles; Business Analyst - Job Roles; Power BI Developer - Job Roles; Power BI for Data Scientists Comparing MSBI and Power BI; Comparing Tableau and Power BI; MCSA 70-778, MCSA 70-779 Exam; Types of Reports in Real-World; Interactive & Paginated Reports; Analytical & Mobile Reports; Data Sources Types in Power BI; Licensing Plans; Power BI Training : Lab Plan; Power BI Dev, Prod Environments;

Chapter 2 : BASIC REPORT DESIGN

Power BI Desktop Installation; Data Sources & Visual Types; Canvas, Visualizations and Fields; Get Data and Memory Tables; In-Memory xvelocity Database; Table and Tree Map Visuals; Format Button and Data Labels; Legend, Category and Grid; PBIX and PBIT File Formats; Visual Interaction, Data Points; Disabling Visual Interactions; Edit Interactions - Format Options; SPOTLIGHT & FOCUSMODE; CSV and PDF Exports. Tooltips; Power BI EcoSystem, Architecture;

Chapter 3 : VISUAL SYNC, GROUPING

Slicer Visual : Real-time Usage; Orientation, Selection Properties; Single & Multi Select, CTRL Options; Slicer : Number, Text and Date Data; Slicer List and Slicer Dropdowns; Visual Sync Limitations; Disabling Slicers; Grouping : Real-time Use, Examples; List Grouping and Binning Options; Grouping Static / Fixed Data Values; Grouping Dynamic / Changing Data; Bin Size and Bin Limits (Max, Min); Bin Count and Grouping Options; Grouping Binned Data, Classification;

Chapter 4 : HIERARCHIES, FILTERS

Creating Hierarchies in Power BI; Independent Drill-Down Options; Dependant Drill-Down Options; Conditional Drilldowns, Data Points; Drill Up Buttons and Operations; Expand & Show Next Level Options; Dynamic Data Drills Limitations; Show Data and See Records; Filters : Types and Usage in Real-time; Visual Filter, Page Filter, Report Filter; Basic, Advanced and TOP N Filters; Category and Summary Level Filters; DrillThru Filters, Drill Thru Reports; Keep All Filters" Options in DrillThru; CrossReport Filters, Include, Exclude;

Chapter 5 : BOOKMARKS, AZURE, MODELING

Drill-thru Filters, Page Navigations; Bookmarks : Real-time Usage; Bookmarks for Visual Filters; Bookmarks for Page Navigations; Selection Pane with Bookmarks; Buttons, Images with Actions;
Buttons, Actions and Text URLs; Bookmarks View & Selection Pane; OLTP Databases, Big Data Sources; Azure Database Access, Reports; Import &Direct Query with Power BI; Enter Data; Data Modeling : Currency, Relations; Summary, Format, Synonyms; Web & Mobile View in PBI;

Chapter 6 : VISUALIZATION PROPERTIES

Stacked Charts and Clustered Charts; Line Charts, Area Charts, Bar Charts; 100% Stacked Bar and Column Charts; Map Visuals: Tree, Filled, Bubble; Cards, Funnel, Table, Matrix; Scatter Chart : Play Axis, Labels; Series Clusters; Waterfall Chart; ArcGIS Maps; Infographics; Color Saturation, Sentiment Colors; Column Series, Column Axis in Lines; Join Types : Round, Bevel, Miter; Shapes, Markers, Axis, Plot Area; Data Colors; Series, Custom Series and Legends;

Chapter 7 : POWER QUERY LEVEL 1

Power Query Architecture and M Language; Data Types, Literals and Values; Power Query Transformation Types; Table & Column; Text & Number Transformations; Date, Time and Structured Data; List, Record & Table; let, source, in statements @ M Lang; Power Query Functions, Parameters; Invoke Functions; Get Data, Table Creations, Edit; Merge and Append Transformations; Join Kinds, Advanced Editor, Apply; ETL Operations with Power Query;

Chapter 8 : POWER QUERY LEVEL 2

Query Duplicate, Query Reference; Group By and Advanced Options; Aggregations with Power Query; Transpose, Header Row Promotion; Reverse Rows and Row Count; Data Type Changes & Detection; Replace Columns: Text, NonText; Replace Nulls: Fill Up, Fill Down; PIVOT, UNPIVOT; Move Column and Split Column; Extract, Format; Date & Time Transformations; Deriving Year, Quarter, Month, Chapter; Add Column : Query Expressions; Query Step Inserts and Step Edits;

Chapter 9 : POWER QUERY LEVEL 3

Creating Parameters in Power Query; Parameter Data Types, Default Lists; Static/Dynamic Lists For Parameters; Removing Columns and Duplicates; Convert Tables to List Queries; Linking Parameters to Queries; Parameters and PBI Canvas; Multi-Valued Parameter Lists; Creating Lists in Power Query; Converting Lists to Table Data; Advanced Edits and Parameters; Data Type Conversions, Expressions; Columns From Examples, Indexes; Conditional Columns, Expressions;

Chapter 10 : DAX Functions - Level 1

DAX : Importance in Real-time; Real-world usage of Excel, DAX; DAX Architecture, Entity Sets; DAX Data Types, Syntax Rules; DAX Measures and Calculations; ROW Context and Filter Context; DAX Operators, Special Characters; DAX Functions, Types in Real-time; Vertipaq Engine, DAX Cheat Sheet; Creating, Using Measures with DAX; Creating, Columns with DAX; Quick Measures; SUM, AVERAGEX, KEEPFILTERS; Dynamic Expressions, IF in DAX;

Chapter 11 : DAX Functions - Level 2

Data Modeling Options in DAX; Detecting Relations for DAX; Using Calculated Columns in DAX; Using Aggregated Measures in DAX; Working with Facts & Measures; Modelling : Missing Relations; Modelling : Relation Management; CALCULATE Function Conditions; CALCULATE & ALL Member Scope; RELATED & COUNTROWS in DAX; Slicing; Dynamic Expressions, RETURN; Date, Time, Text Functions; Logical, Mathematical Functions; Running Total, EARLIER Function;

Chapter 12 : DAX FUNCTIONS - Level 3

1:1, 1:M and M:1 Relations; Connection with CSV, MS Access; AVERAGEX and AVERAGE in DAX; KEEPFILTERS and CALCUALTE; COUNTROWS, RELATED, DIVIDE; PARALLELPERIOD, DATEDADD; CALCULATE & PREVIOUSMONTH; USERELATIONSHIP, DAX Variables; TOTALYTD , TOTALQTD; DIVIDE, CALCULATE, Conditions; IF..ELSE..THEN Statement; SELECTEDVALUE, FORMAT; SUM, DATEDIFF Examples; TOCHAPTER, DATE, CHAPTER with DAX; Time Intelligence Functions;

Chapter 13 : POWER BI CLOUD - 1

Power BI Service Architecture; Power BI Cloud Components, Use; App Workspaces, Report Publish Related Datasets Cloud; Creating New Reports in Cloud; Report Publish and Report Uploads;

Dashboards Creation and Usage; Adding Tiles to Dashboards; Pining Visuals and Report Pages; Visual Pin Actions in Dashboards; LIVE Interaction in Dashboard; Adding Images, Custom Links; Videos & Embed Links; API Data Sources; Streaming Dataset Tiles (REST API);

Chapter 14 : POWER BI CLOUD - 2

Dashboards Actions, Report Actions; DataSet Actions: Create Report; Share, Metrics and Exports; Mobile View & Dashboard Themes; Q & A [Cortana], Pin Visuals; Export, Subscribe, Subscribe; Favourite, Insights, Embed Code; Featured Dashboards and Refresh; Gateways Configuration, PBI Service; Gateway Types; Gateway Clusters, Data Refresh : Manual, Automatic; PBIEngw Service; DataFlows, Power Query Expressions; Adding Entities, JSON Files;

Chapter 15 : EXCEL, ROW LEVEL SECURITY

Import and Upload Options in Excel; Excel Workbooks and Dashboards; Datasets in Excel and Dashboards; Using Excel Analyzer in Power BI; Using Excel Publisher in PBI Cloud; Excel Workbooks, PINS in Power BI; Excel ODC Connections, Power Pivot; Row Level Security (RLS) with DAX; Need for RLS in Power BI Cloud; Data Modelling; DAX Roles Creation and Testing; Power BI Users to Roles; Custom Visualizations; Histogram, Gantt Chart, Info graphics;

Chapter 16: REPORT SERVER, REPORT BUILDER

Need for Report Server in PROD; Install, Configure Report Server; Report Server DB, Temp Database; Webservice URL, Webportal URL; Creating Hybrid Cloud with Power BI; Using Power BI DesktopRS; Uploading Interactive Reports; Report Builder; Report Builder For Power BI Cloud; Designing Paginated Reports (RDL); Deploy to Power BI Report Server; Data Source Connections, Report; Power BI Report Server to Cloud; Tenant IDs; Mobile Report Publisher;

Chapter 17 : MSBI INTEGRATIONS WITH POWER BI

Power BI with SQL Server Source; Power BI with SQL Data Warehouse; Power BI with SSAS OLAP Server; Power BI with Azure SQL DB Source; Power BI with Azure SQL Warehouse; Power BI with Azure Analysis Server; Power BI with SSRS (RDL) Reports; Power BI Report Builder Tool; Paginated Reports Design, Use; Data Sources, Datasets, RDL; Report Publish (RDL) to Cloud; Report Verifications; Interactive Vs Paginated Reports; Configuring & Managing Alerts in Cloud;

Chapter 18: Real-time Project [Sales & Customers]

Resume, Project Oriented FAQs and Solutions

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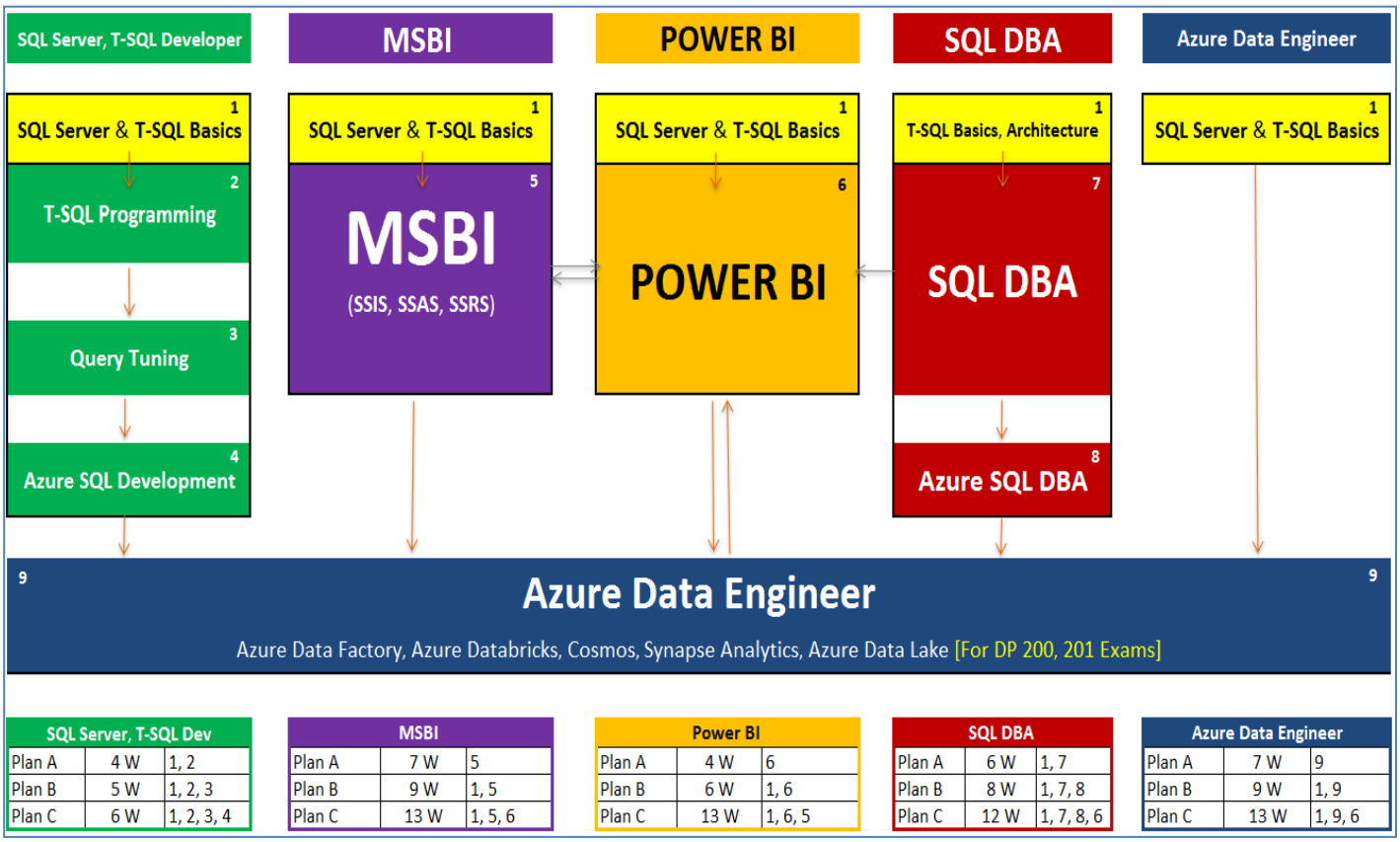

SQL Server, T-SQL Dev		
Plan A	4 W	1, 2
Plan B	5 W	1, 2, 3
Plan C	6 W	1, 2, 3, 4

MSBI		
Plan A	7 W	5
Plan B	9 W	1, 5
Plan C	13 W	1, 5, 6

Power BI		
Plan A	4 W	6
Plan B	6 W	1, 6
Plan C	13 W	1, 6, 5

SQL DBA		
Plan A	6 W	1, 7
Plan B	8 W	1, 7, 8
Plan C	12 W	1, 7, 8, 6

Azure Data Engineer		
Plan A	7 W	9
Plan B	9 W	1, 9
Plan C	13 W	1, 9, 6

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