



Microsoft Certified Azure Database Administrator Associate

# Exam DP-300 Administering Relational Databases on Microsoft Azure

Demo Questions



## (DP-300) Administering Relational Databases on Microsoft Azure

### Question #1

You have 20 Azure SQL databases provisioned by using the vCore purchasing model.

You plan to create an Azure SQL Database elastic pool and add the 20 databases.

Which three metrics should you use to size the elastic pool to meet the demands of your workload? Each correct answer presents part of the solution.

NOTE: Each correct selection is worth one point.

- A. total size of all the databases
- B. geo-replication support
- C. number of concurrently peaking databases \* peak CPU utilization per database
- D. maximum number of concurrent sessions for all the databases
- E. total number of databases \* average CPU utilization per database

Correct Answer: A, C, E

CE: Estimate the vCores needed for the pool as follows:

For vCore-based purchasing model:  $\text{MAX}(\langle \text{Total number of DBs} \times \text{average vCore utilization per DB} \rangle, \langle \text{Number of concurrently peaking DBs} \times \text{Peak vCore utilization per DB} \rangle)$

A: Estimate the storage space needed for the pool by adding the number of bytes needed for all the databases in the pool.

Reference: <https://docs.microsoft.com/en-us/azure/azure-sql/database/elastic-pool-overview>

### Question #2

You have SQL Server 2019 on an Azure virtual machine that contains an SSISDB database.

A recent failure causes the master database to be lost.

You discover that all Microsoft SQL Server integration Services (SSIS) packages fail to run on the virtual machine.

Which four actions should you perform in sequence to resolve the issue? To answer, move the appropriate actions from the list of actions to the answer area and arrange them in the correct.

Select and Place:

#### Actions

Add a certificate to an Azure key vault

Enable Transparent Data Encryption (TDE)

Encrypt a copy of the master key by using the service master key

Turn on the TRUSTWORTHY property and the CLR property

Attach the SSISDB database

Open the master key for the SSISDB database

#### Answer Area



Correct Answer:

Actions	Answer Area
Add a certificate to an Azure key vault	Attach the SSISDB database
Enable Transparent Data Encryption (TDE)	Turn on the TRUSTWORTHY property and the CLR property
Encrypt a copy of the master key by using the service master key	Open the master key for the SSISDB database
Turn on the TRUSTWORTHY property and the CLR property	Encrypt a copy of the master key by using the service master key
Attach the SSISDB database	
Open the master key for the SSISDB database	

Step 1: Attach the SSISDB database

Step 2: Turn on the TRUSTWORTHY property and the CLR property

If you are restoring the SSISDB database to an SQL Server instance where the SSISDB catalog was never created, enable common language runtime (clr)

Step 3: Open the master key for the SSISDB database

Restore the master key by this method if you have the original password that was used to create SSISDB. open master key decryption by password = 'LS1Setup!' --'Password used when creating SSISDB'

Alter Master Key Add encryption by Service Master Key

Step 4: Encrypt a copy of the mater key by using the service master key

Reference:

<https://docs.microsoft.com/en-us/sql/integration-services/backup-restore-and-move-the-ssis-catalog>

### Question #3

You have an Azure SQL database that contains a table named factSales. FactSales contains the columns shown in the following table.

Name	Data type
SalesID	Int
Product	Int
Total Number	Numeric(8,4)
Tax Number	Numeric(8,4)
SalesRep	Varchar(30)

FactSales has 6 billion rows and is loaded nightly by using a batch process. You must provide the greatest reduction in space for the database and maximize performance.

Which type of compression provides the greatest space reduction for the database?

A. page compression

- B. row compression
- C. columnstore compression
- D. columnstore archival compression

Correct Answer: D

Columnstore tables and indexes are always stored with columnstore compression. You can further reduce the size of columnstore data by configuring an additional compression called archival compression.

Note: Columnstore indexes The columnstore index is also logically organized as a table with rows and columns, but the data is physically stored in a column-wise data format.

Incorrect Answers:

B: Rowstore indexes The rowstore index is the traditional style that has been around since the initial release of SQL Server.

For rowstore tables and indexes, use the data compression feature to help reduce the size of the database.

Reference:

<https://docs.microsoft.com/en-us/sql/relational-databases/data-compression/data-compression>

#### Question #4

You have a Microsoft SQL Server 2019 database named DB1 that uses the following database-level and instance-level features.

- ☞ Clustered columnstore indexes
- ☞ Automatic tuning
- ☞ Change tracking
- ☞ PolyBase

You plan to migrate DB1 to an Azure SQL database.

What feature should be removed or replaced before DB1 can be migrated?

- A. Clustered columnstore indexes
- B. PolyBase
- C. Change tracking
- D. Automatic tuning

Correct Answer: B

This table lists the key features for PolyBase and the products in which they're available.

Feature	SQL Server (Beginning with 2016)	Azure SQL Database	Azure Synapse Analytics	Parallel Data Warehouse
Query Hadoop data with Transact-SQL	Yes	No	No	Yes
Import data from Hadoop	Yes	No	No	Yes
Export data to Hadoop	Yes	No	No	Yes
Query, import from, export to Azure HDInsight	No	No	No	No
Push down query computations to Hadoop	Yes	No	No	Yes
Import data from Azure Blob storage	Yes	Yes*	Yes	Yes
Export data to Azure Blob storage	Yes	No	Yes	Yes
Import data from Azure Data Lake Store	No	No	Yes	No
Export data to Azure Data Lake Store	No	No	Yes	No
Run PolyBase queries from Microsoft BI tools	Yes	No	Yes	Yes

Incorrect Answers:

C: Change tracking is a lightweight solution that provides an efficient change tracking mechanism for applications. It applies to both Azure SQL Database and SQL Server.

D: Azure SQL Database and Azure SQL Managed Instance automatic tuning provides peak performance and stable workloads through continuous performance tuning based on AI and machine learning.

Reference:

<https://docs.microsoft.com/en-us/sql/relational-databases/polybase/polybase-versioned-feature-summary>

#### Question #5

You have a Microsoft SQL Server 2019 instance in an on-premises datacenter. The instance contains a 4-TB database named DB1.

You plan to migrate DB1 to an Azure SQL Database managed instance.

What should you use to minimize downtime and data loss during the migration?

- A. distributed availability groups
- B. database mirroring
- C. Always On Availability Group
- D. Azure Database Migration Service

Correct Answer: D

### Question #6

You have an on-premises Microsoft SQL Server 2016 server named Server1 that contains a database named DB1.

You need to perform an online migration of DB1 to an Azure SQL Database managed instance by using Azure Database Migration Service.

How should you configure the backup of DB1? To answer, select the appropriate options in the answer area.

NOTE:

Each correct selection is worth one point.

Hot Area:

#### Answer Area

Backup type: 

	▼
Full and log backups only	
Full backup only	
Log backup only	

Backup option: 

	▼
WITH CHECKSUM	
WITH NOINIT	
WITH UNLOAD	

Correct Answer:

#### Answer Area

Backup type: 

	▼
Full and log backups only	
Full backup only	
Log backup only	

Backup option: 

	▼
WITH CHECKSUM	
WITH NOINIT	
WITH UNLOAD	

Box 1: Full and log backups only

Make sure to take every backup on a separate backup media (backup files). Azure Database Migration Service doesn't support backups that are appended to a single backup file. Take full backup and log backups to separate backup files.

Box 2: WITH CHECKSUM -

Azure Database Migration Service uses the backup and restore method to migrate your on-premises databases to SQL Managed Instance. Azure Database

Migration Service only supports backups created using checksum.

Incorrect Answers:

NOINIT Indicates that the backup set is appended to the specified media set, preserving existing backup sets. If a media password is defined for the media set, the password must be supplied. NOINIT is the default.

Reference: <https://docs.microsoft.com/en-us/azure/dms/known-issues-azure-sql-db-managed-instance-online>

### Question #7

You have a resource group named App1Dev that contains an Azure SQL Database server named DevServer1. DevServer1 contains an Azure SQL database named DB1. The schema and permissions for DB1 are saved in a Microsoft SQL Server Data Tools (SSDT) database project.

You need to populate a new resource group named App1Test with the DB1 database and an Azure SQL Server named TestServer1. The resources in App1Test must have the same configurations as the resources in App1Dev. Which four actions should you perform in sequence? To answer, move the appropriate actions from the list of actions to the answer area and arrange them in the correct order.

Select and Place:

Actions		Answer Area
Change the Active Directory Admin on TestServer1		
Change the server name and related variables in the templates		
From the database project, deploy the database schema and permissions	➤	⬆
Add IP addresses to the firewall	⬅	⬇
From the Azure portal, export the Azure Resource Manager templates		
From the Azure portal, deploy the templates.		

Correct Answer:

Actions		Answer Area
Change the Active Directory Admin on TestServer1		From the Azure portal, export the Azure Resource Manager templates
Change the server name and related variables in the templates		Change the server name and related variables in the templates
From the database project, deploy the database schema and permissions	➤	From the Azure portal, deploy the templates.
Add IP addresses to the firewall	⬅	From the database project, deploy the database schema and permissions
From the Azure portal, export the Azure Resource Manager templates		
From the Azure portal, deploy the templates.		

### Question #8

You have an Azure Synapse Analytics dedicated SQL pool named Pool1 and an Azure Data Lake Storage Gen2 account named Account1.

You plan to access the files in Account1 by using an external table.

You need to create a data source in Pool1 that you can reference when you create the external table.

How should you complete the Transact-SQL statement? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.

Hot Area:

#### Answer Area

```
CREATE EXTERNAL DATA SOURCE source1  
WITH  
( LOCATION = 'https://account1.

|       |   |
|-------|---|
|       | ▼ |
| blob  |   |
| dfs   |   |
| table |   |

.core.windows.net',  


|                     |   |
|---------------------|---|
|                     | ▼ |
| PUSHDOWN = ON       |   |
| TYPE = BLOB_STORAGE |   |
| TYPE = HADOOP       |   |

  
)
```

Correct Answer:

#### Answer Area

```
CREATE EXTERNAL DATA SOURCE source1  
WITH  
( LOCATION = 'https://account1.

|       |   |
|-------|---|
|       | ▼ |
| blob  |   |
| dfs   |   |
| table |   |

.core.windows.net',  


|                     |   |
|---------------------|---|
|                     | ▼ |
| PUSHDOWN = ON       |   |
| TYPE = BLOB_STORAGE |   |
| TYPE = HADOOP       |   |

  
)
```

Box 1: blob -

The following example creates an external data source for Azure Data Lake Gen2

```
CREATE EXTERNAL DATA SOURCE YellowTaxi
```

```
WITH ( LOCATION = 'https://azureopendatastorage.blob.core.windows.net/nyctlc/yellow/',
```

```
TYPE = HADOOP)
```

Box 2: HADOOP -

Reference: <https://docs.microsoft.com/en-us/azure/synapse-analytics/sql/develop-tables-external-tables>

### Question #9

You plan to develop a dataset named Purchases by using Azure Databricks. Purchases will contain the following columns:

- ☞ ProductID
- ☞ ItemPrice
- ☞ LineTotal
- ☞ Quantity
- ☞ StoreID
- ☞ Minute
- ☞ Month
- ☞ Hour
- ☞ Year
- ☞ Day

You need to store the data to support hourly incremental load pipelines that will vary for each StoreID. The solution must minimize storage costs.

How should you complete the code? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.

Hot Area:

### Answer Area

```
df.write
```

.bucketBy	("**")
.partitionBy	("StoreID", "Hour")
.range	("StoreID", "Year", "Month", "Day", "Hour")
.sortBy	("Year", "Month", "Day", "Hour", "StoreID")

```
.mode ("append")
```

.csv("/Purchases")
.json("/Purchases")
.parquet("/Purchases")
.saveAsTable("/Purchases")

Correct Answer:

### Answer Area

```
df.write
```

.bucketBy	("**")
.partitionBy	("StoreID", "Hour")
.range	("StoreID", "Year", "Month", "Day", "Hour")
.sortBy	("Year", "Month", "Day", "Hour", "StoreID")

```
.mode ("append")
```

.csv("/Purchases")
.json("/Purchases")
.parquet("/Purchases")
.saveAsTable("/Purchases")

Box 1: .partitionBy -

Example:

```
df.write.partitionBy("y","m","d")  
.mode(SaveMode.Append)  
.parquet("/data/hive/warehouse/db_name.db/" + tableName)
```

Box 2: ("Year","Month","Day","Hour","StoreID")

Box 3: .parquet("/Purchases")

Reference:

<https://intellipaat.com/community/11744/how-to-partition-and-write-dataframe-in-spark-without-deleting-partitions-with-no-new-data>

Question #10

You are designing a streaming data solution that will ingest variable volumes of data.

You need to ensure that you can change the partition count after creation.

Which service should you use to ingest the data?

- A. Azure Event Hubs Standard
- B. Azure Stream Analytics
- C. Azure Data Factory
- D. Azure Event Hubs Dedicated

Correct Answer: D

The partition count for an event hub in a dedicated Event Hubs cluster can be increased after the event hub has been created.

Incorrect Answers:

A: For Azure Event standard hubs, the partition count isn't changeable, so you should consider long-term scale when setting partition count.

Reference:

<https://docs.microsoft.com/en-us/azure/event-hubs/event-hubs-features#partitions>

Question #11

You are building a database in an Azure Synapse Analytics serverless SQL pool.

You have data stored in Parquet files in an Azure Data Lake Storage Gen2 container.

Records are structured as shown in the following sample.

```
{  
  "id":123,  
  "address_housenumber": "19c",  
  "address_line1": "Memory Lane",  
  "applicant1_name": "Jane",  
  "applicant2_name": "Dev"  
}
```

The records contain two applicants at most.

You need to build a table that includes only the address fields.

How should you complete the Transact-SQL statement? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.

Hot Area:

### Answer Area

	▼ applications
CREATE EXTERNAL TABLE	
CREATE TABLE	
CREATE VIEW	

```
WITH (  
    LOCATION = 'applications/',  
    DATA_SOURCE = applications_ds,  
    FILE_FORMAT = applications_file_format  
)  
AS  
SELECT id, [address_housenumber] as addressnumber, [address_line1]  
as addressline1  
FROM  


|             |                                                                                    |
|-------------|------------------------------------------------------------------------------------|
|             | ▼ (BULK 'https://contoso1.dfs.core.windows.net/<br>applications/year=*/*.parquet', |
| CROSS APPLY |                                                                                    |
| OPENJSON    |                                                                                    |
| OPENROWSET  |                                                                                    |

  
    FORMAT = 'PARQUET') AS [r]  
GO
```

Correct Answer:

### Answer Area

	▼ applications
CREATE EXTERNAL TABLE	
CREATE TABLE	
CREATE VIEW	

```
WITH (  
    LOCATION = 'applications/',  
    DATA_SOURCE = applications_ds,  
    FILE_FORMAT = applications_file_format  
)  
AS  
SELECT id, [address_housenumber] as addressnumber, [address_line1]  
as addressline1  
FROM  


|             |                                                                                    |
|-------------|------------------------------------------------------------------------------------|
|             | ▼ (BULK 'https://contoso1.dfs.core.windows.net/<br>applications/year=*/*.parquet', |
| CROSS APPLY |                                                                                    |
| OPENJSON    |                                                                                    |
| OPENROWSET  |                                                                                    |

  
    FORMAT = 'PARQUET') AS [r]  
GO
```

### Box 1: CREATE EXTERNAL TABLE -

An external table points to data located in Hadoop, Azure Storage blob, or Azure Data Lake Storage. External tables are used to read data from files or write data to files in Azure Storage. With Synapse SQL, you can use external tables to read external data using dedicated SQL pool or serverless SQL pool.

Syntax:

```
CREATE EXTERNAL TABLE { database_name.schema_name.table_name | schema_name.table_name |
```

```
table_name }
( <column_definition> [ ,...n ] )
WITH (
LOCATION = 'folder_or_filepath',
DATA_SOURCE = external_data_source_name,
FILE_FORMAT = external_file_format_name
```

## Box 2. OPENROWSET -

When using serverless SQL pool, CETAS is used to create an external table and export query results to Azure Storage Blob or Azure Data Lake Storage Gen2.

Example:

AS -

```
SELECT decennialTime, stateName, SUM(population) AS population
```

FROM -

```
OPENROWSET(BULK
```

```
'https://azureopendatastorage.blob.core.windows.net/censusdatacontainer/release/us_population_county/year=*/*.parquet',
```

```
FORMAT='PARQUET') AS [r]
```

```
GROUP BY decennialTime, stateName
```

GO -

Reference:

<https://docs.microsoft.com/en-us/azure/synapse-analytics/sql/develop-tables-external-tables>

## Question #12

You have an Azure Synapse Analytics Apache Spark pool named Pool1.

You plan to load JSON files from an Azure Data Lake Storage Gen2 container into the tables in Pool1. The structure and data types vary by file.

You need to load the files into the tables. The solution must maintain the source data types.

What should you do?

- A. Load the data by using PySpark.
- B. Load the data by using the OPENROWSET Transact-SQL command in an Azure Synapse Analytics serverless SQL pool.
- C. Use a Get Metadata activity in Azure Data Factory.
- D. Use a Conditional Split transformation in an Azure Synapse data flow.

Correct Answer: B

Serverless SQL pool can automatically synchronize metadata from Apache Spark. A serverless SQL pool database will be created for each database existing in serverless Apache Spark pools.

Serverless SQL pool enables you to query data in your data lake. It offers a T-SQL query surface area that

accommodates semi-structured and unstructured data queries.

To support a smooth experience for in place querying of data that's located in Azure Storage files, serverless SQL pool uses the OPENROWSET function with additional capabilities.

The easiest way to see to the content of your JSON file is to provide the file URL to the OPENROWSET function, specify csv FORMAT.

Reference:

<https://docs.microsoft.com/en-us/azure/synapse-analytics/sql/query-json-files>

<https://docs.microsoft.com/en-us/azure/synapse-analytics/sql/query-data-storage>