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# Microsoft

## 70-465 PRACTICE EXAM

Designing Database Solutions for Microsoft SQL Server 2012

# **Product Questions: 111**

## **Version: 13.0**

### **Case Study: 1**

#### **Litware, Inc**

##### **Overview**

You are a database administrator for a company named Litware, Inc. Litware is a book publishing house. Litware has a main office and a branch office.

You are designing the database infrastructure to support a new web-based application that is being developed. The web application will be accessed at [www.litwareinc.com](http://www.litwareinc.com). Both internal employees and external partners will use the application.

You have an existing desktop application that uses a SQL Server 2008 database named App1\_DB. App1\_DB will remain in production.

#### **Requirements**

##### **Planned Changes**

You plan to deploy a SQL Server 2014 instance that will contain two databases named Database1 and Database2. All database files will be stored in a highly available SAN.

Database1 will contain two tables named Orders and OrderDetails. Database1 will also contain a stored procedure named usp\_UpdateOrderDetails. The stored procedure is used to update order information. The stored procedure queries the Orders table twice each time the procedure executes. The rows returned from the first query must be returned on the second query unchanged along with any rows added to the table between the two read operations.

Database1 will contain several queries that access data in the Database2 tables.

Database2 will contain a table named Inventory. Inventory will contain over 100 GB of data. The Inventory table will have two indexes: a clustered index on the primary key and a nonclustered index. The column that is used as the primary key will use the identity property.

Database2 will contain a stored procedure named usp\_UpdateInventory. Usp\_UpdateInventory will manipulate a table that contains a self-join that has an unlimited number of hierarchies.

All data in Database2 is recreated each day and does not change until the next data creation process.

Data from Database2 will be accessed periodically by an external application named Application1. The data from Database2 will be sent to a database named App1\_Db1 as soon as changes occur to the data in Database2.

Litware plans to use offsite storage for all SQL Server 2014 backups.

#### **Business Requirements**

You have the following requirements:

- Costs for new licenses must be minimized.
- Private information that is accessed by Application must be stored in a secure format.
- Development effort must be minimized whenever possible.
- The storage requirements for databases must be minimized.
- System administrators must be able to run real-time reports on disk usage.
- The databases must be available if the SQL Server service fails.

- Database administrators must receive a detailed report that contains allocation errors and data corruption.
- Application developers must be denied direct access to the database tables. Applications must be denied direct access to the tables.
- You must encrypt the backup files to meet regulatory compliance requirements. The encryption strategy must minimize changes to the databases and to the applications.

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### **Question: 1**

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During performance testing, you discover that database INSERT operations against the Inventory table are slow. You need to recommend a solution to reduce the amount of time it takes to complete the INSERT operations. What should you recommend?

- A. Partition the nonclustered index.
- B. Partition the Inventory table.snapshot replication
- C. Create a column store index.Master Data Services
- D. Drop the clustered index.change data capture

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**Answer: A**

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Explanation:

Scenario: Database2 will contain a table named Inventory. Inventory will contain over 100 GB of data. The Inventory table will have two indexes: a clustered index on the primary key and a nonclustered index. The column that is used as the primary key will use the identity property.

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### **Question: 2**

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You need to recommend a solution to allow application users to perform tables. The solution must meet the business requirements.

What should you recommend?

- A. Create a Policy-Based Management Policy.
- B. Create a user-defined database role and add users to the role.
- C. Create stored procedures that use EXECUTE AS clauses.
- D. Create functions that use EXECUTE AS clauses.

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**Answer: D**

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Explanation:

\* c Clause (Transact-SQL)

In SQL Server you can define the execution context of the following user-defined modules: functions (except inline table-valued functions), procedures, queues, and triggers.

Reference: Using EXECUTE AS in Modules

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### **Question: 3**

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You need to recommend a feature to support your backup solution.

What should you include in the recommendation?

- A. Transparent Data Encryption (TDE)
- B. Column-level encryption
- C. An NTFS file permission
- D. A Secure Sockets Layer (SSL)

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**Answer: A**

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Explanation:

- \* Scenario: You must encrypt the backup files to meet regulatory compliance requirements. The encryption strategy must minimize changes to the databases and to the applications.
- \* Transparent data encryption (TDE) performs real-time I/O encryption and decryption of the data and log files. The encryption uses a database encryption key (DEK), which is stored in the database boot record for availability during recovery.

Reference: Transparent Data Encryption (TDE)

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#### **Question: 4**

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You need to recommend a solution for Application1 that meets the security requirements.  
What should you include in the recommendation?

- A. Signed stored procedures
- B. Certificate Authentication
- C. Encrypted columns
- D. Secure Socket Layer (SSL)

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**Answer: A**

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Explanation:

- \* Scenario:  
/ Data from Database2 will be accessed periodically by an external application named Application1  
/ Application developers must be denied direct access to the database tables. Applications must be denied direct access to the tables.

Reference:

Tutorial: Signing Stored Procedures with a Certificate

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#### **Question: 5**

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You need to recommend a disk monitoring solution that meets the business requirements.  
What should you include in the recommendation?

- A. An audit
- B. A dynamic management view
- C. A maintenance plan
- D. An SQL Server Agent alert

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**Answer: B**

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Explanation:

Reference:

Dynamic Management Views and Functions (Transact-SQL)

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### **Question: 6**

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You need to recommend a solution to improve the performance of usp.UpdateInventory. The solution must minimize the amount of development effort.

What should you include in the recommendation?

- A. A table variable
- B. A common table expression
- C. A subquery
- D. A cursor

---

**Answer: A**

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Explanation:

\*Scenario: Database2 will contain a stored procedure named usp\_UpdateInventory. Usp\_UpdateInventory will manipulate a table that contains a self-join that has an unlimited number of hierarchies.

\* A table variable can be very useful to store temporary data and return the data in the table format.

tabHYPERLINK "http://technet.microsoft.com/en-us/library/aa260638(v=SQL.80).aspx"IHYPERNLINK "http://technet.microsoft.com/en-us/library/aa260638(v=SQL.80).aspx"e

\* Example: The following example uses a self-join to find the products that are supplied by more than one vendor.

Because this query involves a join of the ProductVendor table with itself, the ProductVendor table appears in two roles. To distinguish these roles, you must give the ProductVendor table two different aliases (pv1 and pv2) in the FROM clause. These aliases are used to qualify the column names in the rest of the query. This is an example of the self-join Transact-SQL statement:

```
USE AdventureWorks2008R2;
GO
SELECT DISTINCT pv1.ProductID, pv1.VendorID
FROM Purchasing.ProductVendor pv1
INNER JOIN Purchasing.ProductVendor pv2
ON pv1.ProductID = pv2.ProductID
AND pv1.VendorID <> pv2.VendorID
ORDER BY pv1.ProductID
```

Incorrect:

Not B: Using a CTE offers the advantages of improved readability and ease in maintenance of complex queries. The query can be divided into separate, simple, logical building blocks. These simple blocks can then be used to build more complex, interim CTEs until the final result set is generated.

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### **Question: 7**

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You need to recommend a solution for the deployment of SQL Server 2014. The solution must meet the business requirements.

What should you include in the recommendation?

- A. Create a new instance of SQL Server 2014 on the server that hosts the SQL Server 2008 instance.
- B. Upgrade the existing SQL Server 2008 instance to SQL Server 2014.
- C. Deploy two servers that have SQL Server 2014 installed and implement Failover Clustering.
- D. Deploy two servers that have SQL Server 2014 installed and implement database mirroring.

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**Answer: C**

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**Explanation:**

**Scenario:** The databases must be available if the SQL Server service fails.

**Reference:**

Failover Clustering Overview

Windows Server Failover Clustering (WSFC) with SQL Server

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### **Question: 8**

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You need to recommend a solution to synchronize Database2 to App1\_Db1.

What should you recommend?

- A. Change data capture
- B. Snapshot replication
- C. Master Data Services
- D. Transactional replication

---

**Answer: D**

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**Explanation:**

**Scenario:**

\* Data from Database2 will be accessed periodically by an external application named Application1. The data from Database2 will be sent to a database named App1\_Db1 as soon as changes occur to the data in Database2.

\* All data in Database2 is recreated each day and does not change until the next data creation process.

**Reference:**

Transactional Replication

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### **Question: 9**

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You need to recommend a database reporting solution that meets the business requirements.

What should you include in the recommendation?

- A. Data collection
- B. Performance Monitor
- C. A maintenance plan
- D. A dynamic management view

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**Answer: A**

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**Explanation:**

\* Scenario: System administrators must be able to run real-time reports on disk usage.

\* The data collector provides an historical report for each of the System Data collection sets. Each of the following reports use data that is stored in the management data warehouse:

Disk Usage Summary

Query Statistics History

Server Activity History

You can use these reports to obtain information for monitoring system capacity and troubleshooting system performance.

**Reference:**

System Data Collection Set Reports

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## **Question: 10**

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You need to recommend an isolation level for usp\_UpdateOrderDetails.  
Which isolation level should you recommend?

- A. Read committed
- B. Repeatable read
- C. Read uncommitted
- D. Serializable

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## **Answer: B**

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**Explanation:**

\* Scenario: Database will also contain a stored procedure named usp\_UpdateOrderDetails. The stored procedure is used to update order information. The stored procedure queries the Orders table twice each time the procedure executes. The rows returned from the first query must be returned on the second query unchanged along with any rows added to the table between the two read operations.

\* REPEATABLE READ

Specifies that statements cannot read data that has been modified but not yet committed by other transactions and that no other transactions can modify data that has been read by the current transaction until the current transaction completes.

Reference: Transaction Isolation Levels

## **Case Study: 2**

### **Contoso Ltd**

#### **Overview**

#### **Application Overview**

Contoso, Ltd., is the developer of an enterprise resource planning (ERP) application.

Contoso is designing a new version of the ERP application. The previous version of the ERP application used SQL Server 2008 R2. The new version will use SQL Server 2014.

The ERP application relies on an import process to load supplier data. The import process updates thousands of rows simultaneously, requires exclusive access to the database, and runs daily.

You receive several support calls reporting unexpected behavior in the ERP application.

After analyzing the calls, you conclude that users made changes directly to the tables in the database.

#### **Tables**

**The current database schema contains a table named OrderDetails. The OrderDetails table contains information about the items sold for each purchase order. OrderDetails stores the product ID, quantities, and discounts applied to each product in a purchase order. The product price is stored in a table named Products.**

The Products table was defined by using the SQL\_Latin1\_General\_CI\_AS collation. A column named ProductName was created by using the varchar data type.

The database contains a table named Orders. Orders contain all of the purchase orders from the last 12 months. Purchase orders that are older than 12 months are stored in a table named OrdersOld.

#### **Stored Procedures**

The current version of the database contains stored procedures that change two tables. The following shows

the relevant portions of the two stored procedures:

```
CREATE PROC Sales.Proc1
AS
BEGIN TRAN
UPDATE Sales.Table1 ...
UPDATE Sales.Table2 ...
COMMIT TRAN
GO

CREATE PROC Sales.Proc2
AS
BEGIN TRAN
UPDATE Sales.Table2 ...
UPDATE Sales.Table1 ...
COMMIT TRAN
GO
```

## **Customer Problems**

### **Installation Issues**

The current version of the ERP application requires that several SQL Server logins be set up to function correctly. Most customers set up the ERP application in multiple locations and must create logins multiple times.

### **Index Fragmentation Issues**

Customers discover that clustered indexes often are fragmented. To resolve this issue, the customers defragment the indexes more frequently.

All of the tables affected by fragmentation have the following columns that are used as the clustered index key:

Column	Data type
id	uniqueidentifier
lastModified	datetime
modifiedBy	varchar(200)

### **Backup Issues**

Customers who have large amounts of historical purchase order data report that backup time is unacceptable.

### **Search Issues**

Users report that when they search product names, the search results exclude product names that contain accents, unless the search string includes the accent.

### **Missing Data Issues**

Customers report that when they make a price change in the Products table, they cannot retrieve the price that the item was sold for in previous orders.

### **Query Performance Issues**

Customers report that query performance degrades very quickly. Additionally, the customers report that users cannot run queries when SQL Server runs maintenance tasks.

### **Import Issues**

During the monthly import process, database administrators receive many supports call from users who report that they cannot access the supplier data. The database administrators want to reduce the amount of time required to import the data.

### **Design Requirements**

### **File Storage Requirements**

The ERP database stores scanned documents that are larger than 2 MB. These files must only be accessed through the ERP application. File access must have the best possible read and write performance.

### **Data Recovery Requirements**

If the import process fails, the database must be returned to its prior state immediately.

### **Security Requirements**

You must provide users with the ability to execute functions within the ERP application, without having direct access to the underlying tables.

### **Concurrency Requirements**

You must reduce the likelihood of deadlocks occurring when Sales.Proc1 and Sales.Proc2 execute.

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### **Question: 1**

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You need to recommend a solution that resolves the missing data issue. The solution must minimize the amount of development effort.

What should you recommend?

- A. Denormalize the Products table.
- B. Denormalize the OrderDetails table.
- C. Normalize the OrderDetails table.
- D. Normalize the Products table.

---

**Answer: D**

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Explanation:

\* Scenario

/ Missing Data Issues

Customers report that when they make a price change in the Products table, they cannot retrieve the price that the item was sold for in previous orders.

/ The current database schema contains a table named OrderDetails. The OrderDetails table contains information about the items sold for each purchase order. OrderDetails stores the product ID, quantities, and discounts applied to each product in a purchase order. The product price is stored in a table named Products.

Reference: [http://technet.microsoft.com/en-us/library/aa933055\(v=sql.80\).aspx](http://technet.microsoft.com/en-us/library/aa933055(v=sql.80).aspx)

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### **Question: 2**

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You need to recommend a solution that addresses the index fragmentation and index width issue.

What should you include in the recommendation? (Each correct answer presents part of the solution. Choose all that apply.)

- A. Change the data type of the lastModified column to smalldatetime.
- B. Remove the lastModified column from the clustered index.
- C. Change the data type of the modifiedBy column to tinyint.
- D. Change the data type of the id column to bigint.
- E. Remove the modifiedBy column from the clustered index.
- F. Remove the id column from the clustered index.

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**Answer: B, E**

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Explanation:

Scenario: Index Fragmentation Issues

Customers discover that clustered indexes often are fragmented. To resolve this issue, the customers defragment the indexes more frequently.

All of the tables affected by fragmentation have the following columns that are used as the clustered index key:

Column	Data type
id	uniqueidentifier
lastModified	datetime
modifiedBy	varchar(200)

### **Question: 3**

You need to recommend a solution that reduces the time it takes to import the supplier data.

What should you include in the recommendation?

- A. Enable instant file initialization.
- B. Reorganize the indexes.
- C. Disable Resource Governor.
- D. Enable Auto Update Statistics.

**Answer: C**

Explanation:

\* The ERP application relies on an import process to load supplier data. The import process updates thousands of rows simultaneously, requires exclusive access to the database, and runs daily.

Resource Governor

### **Question: 4**

You need to recommend a solution that meets the data recovery requirement.

What should you include in the recommendation?

- A. A differential backup
- B. A transaction log backup
- C. Snapshot isolation
- D. A database snapshot

**Answer: D**

Explanation:

Reference:

How Database Snapshots Work

### **Question: 5**

You need to recommend a solution that addresses the file storage requirements.

What should you include in the recommendation?

- A. FileStream
- B. FileTable
- C. The varbinary data type
- D. The image data type

---

**Answer: B**

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**Explanation:**

\* Scenario: File Storage Requirements

The ERP database stores scanned documents that are larger than 2 MB. These files must only be accessed through the ERP application. File access must have the best possible read and write performance.

\* FileTables remove a significant barrier to the use of SQL Server for the storage and management of unstructured data that is currently residing as files on file servers. Enterprises can move this data from file servers into FileTables to take advantage of integrated administration and services provided by SQL Server. At the same time, they can maintain Windows application compatibility for their existing Windows applications that see this data as files in the file system.

Reference: FileTables (SQL Server)

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### **Question: 6**

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You need to recommend a solution that addresses the installation issues.

What should you include in the recommendation?

- A. Windows logins
- B. Server roles
- C. Contained users
- D. Database roles

---

**Answer: C**

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**Explanation:**

\* Scenario: Installation Issues

The current version of the ERP application requires that several SQL Server logins be set up to function correctly. Most customers set up the ERP application in multiple locations and must create logins multiple times.

\* Creating contained users enables the user to connect directly to the contained database. This is a very significant feature in high availability and disaster recovery scenarios such as in an AlwaysOn solution. If the users are contained users, in case of failover, people would be able to connect to the secondary without creating logins on the instance hosting the secondary. This provides an immediate benefit.

Contained Databases

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### **Question: 7**

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You need to recommend a solution that addresses the security requirement.

What should you recommend?

- A. Revoke user permissions on the tables. Create stored procedures that manipulate data. Grant the users the EXECUTE permission on the stored procedures.
- B. Grant the users the SELECT permission on the tables. Create views that retrieve data from the tables. Grant the users the SELECT permission on the views.
- C. Deny the users SELECT permission on the tables. Create views that retrieve data from the tables. Grant the users

the SELECT permission on the views.

D. Deny the users the SELECT permission on the tables. Create stored procedures that manipulate data. Grant the users the EXECUTE permission on the stored procedures.

---

**Answer: C**

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Explanation:

\* Security Requirements

You must provide users with the ability to execute functions within the ERP application, without having direct access to the underlying tables.

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### **Question: 8**

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You need to recommend changes to the ERP application to resolve the search issue. The solution must minimize the impact on other queries generated from the ERP application.

What should you recommend changing?

- A. The collation of the Products table
- B. The index on the ProductName column
- C. The collation of the ProductName column
- D. The data type of the ProductName column

---

**Answer: C**

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Explanation:

Reference:

[http://technet.microsoft.com/en-us/library/aa214408\(v=sql.80\).aspx](http://technet.microsoft.com/en-us/library/aa214408(v=sql.80).aspx)

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### **Question: 9**

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You need to recommend a solution that addresses the concurrency requirement.

What should you recommend?

- A. Break each stored procedure into two separate procedures, one that changes Sales.Table1 and one that changes Sales.Table2.
- B. Make calls to Sales.Proc1 and Sales.Proc2 synchronously.
- C. Call the stored procedures in a Distributed Transaction Coordinator (DTC) transaction.
- D. Modify the stored procedures to update tables in the same order for all of the stored procedures.

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**Answer: D**

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Explanation:

\* Concurrency Requirements

You must reduce the likelihood of deadlocks occurring when Sales.Proc1 and Sales.Proc2 execute.

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### **Question: 10**

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You need to recommend a solution that addresses the backup issue. The solution must minimize the amount of development effort.

What should you include in the recommendation?

- A. Indexed views
- B. Filegroups
- C. Table partitioning
- D. Indexes

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**Answer: B**

Explanation:

\* Backup Issues

Customers who have large amounts of historical purchase order data report that backup time is unacceptable.

\* For very large databases (and by that, I mean, at least 500gb, but more like 5-10tb or more), it can become too expensive to regularly run a straight full backup. So, where needed, you can choose to backup smaller pieces of the database by choosing to back up one of the files or file groups that make up a database.

Reference: Using Filegroups and Files to Store Data

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### **Question: 11**

What should you recommend for the updates to Sales.TransactionHistory?

- A. a REPEATABLE READ isolation level
- B. implicit transactions
- C. query hints
- D. a SNAPSHOT isolation level

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**Answer: A**

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### **Question: 12**

DRAG DROP

You need to recommend which statement should be used to update SalesOrder.

How should you recommend completing the statement? To answer, drag the appropriate elements to the correct locations. Each element may be used once, more than once, or not at all. You may need to drag the split bar between panes or scroll to view content.

Elements	Answer Area
EXPLICIT	SET
ISOLATION	LEVEL
READ UNCOMMITTED	BEGIN
ROLLBACK	UPDATE SalesOrder ...
SERIALIZABLE	COMMIT TRANSACTION;
SNAPSHOT	
TABLOCK	
TRANSACTION	

---

**Answer:**

---

**Answer Area**

```

SET TRANSACTION ISOLATION LEVEL
LEVEL SNAPSHOT
BEGIN TRANSACTION
UPDATE SalesOrder
...
COMMIT TRANSACTION;

```

**Explanation:**

\* Syntax is:

SET TRANSACTION ISOLATION LEVEL

```

{ READ UNCOMMITTED
| READ COMMITTED
| REPEATABLE READ
| SNAPSHOT

```

```
| SERIALIZABLE  
}  
[]
```

SNAPSHOT specifies that data read by any statement in a transaction will be the transactionally consistent version of the data that existed at the start of the transaction.

\* You begin a transaction with keywords: BEGIN TRANSACTION

## **Case Study: 3**

### **Fabrikam, Inc**

#### **Background**

#### **Corporate Information**

Fabrikam, Inc. is a retailer that sells electronics products on the Internet. The company has a headquarters site and one satellite sales office.

You have been hired as the database administrator, and the company wants you to change the architecture of the Fabrikam ecommerce site to optimize performance and reduce downtime while keeping capital expenditures to a minimum. To help with the solution, Fabrikam has decided to use cloud resources as well as on-premise servers.

#### **Physical Locations**

All of the corporate executives, product managers, and support staff are stationed at the headquarters office. Half of the sales force works at this location.

There is also a satellite sales office. The other half of the sales force works at the satellite office in order to have sales people closer to clients in that area.

a. Only sales people work at the satellite location.

#### **Problem Statement**

To be successful, Fabrikam needs a website that is fast and has a high degree of system uptime. The current system operates on a single server and the company is not happy with the single point of failure this presents. The current nightly backups have been failing due to insufficient space on the available drives and manual drive cleanup often needing to happen to get past the errors. Additional space will not be made available for backups on the HQ or satellite servers. During your investigation, you discover that the sales force reports are causing significant contention.

#### **Configuration**

#### **Windows Logins**

The network administrators have set up Windows groups to make it easier to manage security. Users may belong to more than one group depending on their role.

The groups have been set up as shown in the following table:

<b>Group</b>	<b>Members</b>
OurDomain\Management	All corporate executives
OurDomain\SalesStaff	All sales people
OurDomain\ProductionStaff	All product managers and support staff
OurDomain\AllUsers	Everyone
OurDomain\\CustomerSupport	Customer support representatives

#### **Server Configuration**

The IT department has configured two physical servers with Microsoft Windows Server 2012 R2 and SQL

Server 2014 Enterprise Edition and one Windows Azure Server. There are two tiers of storage available for use by database files only a fast tier and a slower tier. Currently the data and log files are stored on the fast tier of storage only. If a possible use case exists, management would like to utilize the slower tier storage for data files.

The servers are configured as shown in the following table:

Location	Server
Company headquarters	HQ_Server
Satellite sales office	Satellite_Server
Microsoft Windows Azure (cloud)	Cloud_File Server

### Database

Currently all information is stored in a single database called ProdDB, created with the following script:

```
CREATE DATABASE ProdDB
GO

ALTER DATABASE ProdDB SET RECOVERY SIMPLE
GO
```

The Product table is in the Production schema owned by the ProductionStaff Windows group. It is the main table in the system so access to information in the Product table should be as fast as possible.

The columns in the Product table are defined as shown in the following table:

Column	Data type
ProductID	INT
ProductName	VARCHAR(100)
ProductDescription	VARCHAR(MAX)
ProductPrice	SMALLMONEY
QuantityOnHand	INT
ProductCost	SMALLMONEY
ProductSupplierID	INT

The SalesOrderDetail table holds the details about each sale. It is in the Sales schema owned by the SalesStaff Windows group.

This table is constantly being updated, inserted into, and read.

The columns in the SalesOrderDetail table are defined as shown in the following table:

Column	Data type
SalesOrderDetailID	INT
ProductID	INT
SalePrice	SMALLMONEY
SaleQuantity	INT

### Database Issues

The current database does not perform well. Additionally, a recent disk problem caused the system to go down, resulting in lost sales revenue. In reviewing the current system, you found that there are no automated maintenance procedures. The database is severely fragmented, and everyone has read and write access.

### Requirements

## **Database**

The database should be configured to maximize uptime and to ensure that very little data is lost in the event of a server failure. To help with performance, the database needs to be modified so that it can support in-memory data, specifically for the Product table, which the CIO has indicated should be a memory-optimized table. The auto-update statistics option is set off on this database.

Only product managers are allowed to add products or to make changes to the name, description, price, cost, and supplier. The changes are made in an internal database and pushed to the Product table in ProdDB during system maintenance time. Product managers and others working at the headquarters location also should be able to generate reports that include supplier and cost information.

## **Customer data access**

Customers access the company's website to order products, so they must be able to read product information such as name, description, and price from the Product table. When customers place orders, stored procedures called by the website update product quantity-on-hand values. This means the product table is constantly updated at random times.

## **Customer support data access**

Customer support representatives need to be able to view and not update or change product information. Management does not want the customer support representatives to be able to see the product cost or any supplier information.

## **Sales force data access**

Sales people at both the headquarters office and the satellite office must generate reports that read from the Product and SalesOrderDetail tables. No updates or inserts are ever made by sales people. These reports are run at random times and there can be no reporting downtime to refresh the data set except during the monthly maintenance window. The reports that run from the satellite office are process intensive queries with large data sets. Regardless of which office runs a sales force report, the SalesOrderDetail table should only return valid, committed order data; any orders not yet committed should be ignored.

## **Historical Data**

The system should keep historical information about customers who access the site so that sales people can see how frequently customers log in and how long they stay on the site. The information should be stored in a table called Customer Access. Supporting this requirement should have minimal impact on production website performance.

## **Backups**

The recovery strategy for Fabrikam needs to include the ability to do point in time restores and minimize the risk of data loss by performing transaction log backups every 15 minutes.

## **Database Maintenance**

The company has defined a maintenance window every month when the server can be unavailable. Any maintenance functions that require exclusive access should be accomplished during that window.

## **Project milestones completed**

- Revoked all existing read and write access to the database, leaving the schema ownership in place.
- Configured an Azure storage container secured with the storage account name MyStorageAccount with the primary access key StorageAccountKey on the cloud file server.
- SQL Server 2014 has been configured on the satellite server and is ready for use.
- On each database server, the fast storage has been assigned to drive letter F:, and the slow storage has been assigned to drive letter D:.

### Question: 1

DRAG DROP

You need to distribute functionality across the three servers.

Which function should you assign to each server? To answer, drag the appropriate functions to the correct servers.

Each function may be used once, more than once, or not at all. You may need to drag the split bar between panes or scroll to view content.

#### Functions

AlwaysOn primary replica

AlwaysOn secondary replica

file backup server

witness server

mirroring primary

mirroring secondary

log shipping primary

log shipping secondary

#### Answer Area

HQ office server

Function

satellite office server

Function

cloud server

Function

Answer:

HQ office server	AlwaysOn primary replica
satellite office server	AlwaysOn secondary replica
cloud server	file backup server

Explanation:

Note:

\* Scenario: The current nightly backups have been failing due to insufficient space on the available drives and manual drive cleanup often needing to happen to get past the errors. Additional space will not be made available for backups on the HQ or satellite servers.

Reference: <http://msdn.microsoft.com/en-us/library/ff877884.aspx>

## **Question: 2**

You need to write code that will allow the sales force to retrieve data for their reports with the least amount of effort. Which code should you use?

- A. CREATE PROCEDURE Sales.usp\_CustomerSalesReport  
WITH EXECUTE AS 'OurDomain\ProductionStaff'  
AS  
SELECT \*  
FROM Production.Product  
JOIN Sales.SalesOrderDetail ON Product.ProductID = SalesOrderDetail.ProductID
- B. CREATE VIEW Sales.vw\_CustomerSalesReports  
AS  
SELECT \*  
FROM Production.Product  
JOIN Sales.SalesOrderDetail ON Product.ProductID = SalesOrderDetail.ProductID  
OPTION (NOLOCK)
- C. CREATE PROCEDURE Sales.usp\_CustomerSalesReport  
AS  
SELECT \*  
FROM Production.Product  
JOIN Sales.SalesOrderDetail ON Product.ProductID = SalesOrderDetail.ProductID
- D. CREATE USER MyProxy WITHOUT LOGIN  
GRANT SELECT  
ON Production.Product  
TO MyProxy  
GRANT SELECT  
ON Sales.SalesOrderDetail  
TO MyProxy  
CREATE PROCEDURE Sales.usp\_CustomerSalesReport  
AS  
SELECT \*  
FROM Production.Product  
JOIN Sales.SalesOrderDetail ON Product.ProductID = SalesOrderDetail.ProductID

- A. Option A  
B. Option B  
C. Option C  
D. Option D

---

Answer: A

---

Explanation:

\* Scenario

/ During your investigation, you discover that the sales force reports are causing significant contention.

/ Sales force data access

Sales people at both the headquarters office and the satellite office must generate reports that read from the Product and SalesOrderDetail tables. No updates or inserts are ever made by sales people. These reports are run at random times and there can be no reporting downtime to refresh the data set except during the monthly maintenance window. The reports that run from the satellite office are process intensive queries with large data sets. Regardless of which office runs a sales force report, the SalesOrderDetail table should only return valid, committed order data; any orders not yet committed should be ignored.

---

### Question: 3

---

You are designing your maintenance plan.

Which command should you use only during the monthly maintenance window?

- A. DBCC INDEXDEFRAG (ProdDB, SalesOrderDetail, SODIndex)
- B. ALTER INDEX SODIndex ON SalesOrderDetail REORGANIZE
- C. ALTER INDEX SODIndex ON SalesOrderDetail REBUILD
- D. ALTER INDEX SODIndex ON SalesOrderDetail REBUILD WITH (ONLINE \* ON)

---

**Answer: D**

**Explanation:**

\* Scenario: Database Issues

The current database does not perform well. Additionally, a recent disk problem caused the system to go down, resulting in lost sales revenue. In reviewing the current system, you found that there are no automated maintenance procedures. The database is severely fragmented, and everyone has read and write access.

\* After the degree of fragmentation is known, use the following table to determine the best method to correct the fragmentation.

avg\_fragmentation\_in\_percent value

/ > 5% and < = 30%

then use

ALTER INDEX REORGANIZE

/ > 30%

then use

ALTER INDEX REBUILD WITH (ONLINE = ON)

ALTER INDEX (Transact-SQL)

---

#### **Question: 4**

You need to implement a backup strategy to support the requirements.

Which two actions should you perform? Each correct answer presents part of the solution. Choose two.

- A. Create a credential called MyCredential on SQL Server by using a Windows domain account and password.
- B. Schedule a full backup by using the command BACKUP DATABASE ProdDB TO DISK...
- C. Create a share on your Windows Azure site by using your Windows Azure storage account information, and grant permission to the SQL Server service login.
- D. Schedule a full backup by using the command BACKUP DATABASE ProdDB TO URL ... WTTH CREDENTIAL=N'MyCredential'
- E. Create a share on the hot standby site and grant permission to the SQL Server service login.
- F. Create a credential called MyCredential on SQL Server, using MyStorageAccount for the storage account name and StorageAccountKey for the access key.
- G. Schedule a full backup by using the command BACKUP DATABASE ProdDB TO SHARE ... WITH CREDENTIAL=N'MyCredential'

---

**Answer: C, D**

**Explanation:**

\* Scenario: The current nightly backups have been failing due to insufficient space on the available drives and manual drive cleanup often needing to happen to get past the errors. Additional space will not be made available for backups on the HQ or satellite servers.

\* Need to store files in the cloud.

\* Manage your backups to Windows Azure: Using the same methods used to backup to DISK and TAPE, you can now

back up to Windows Azure storage by Specifying URL as the backup destination. You can use this feature to manually backup or configure your own backup strategy like you would for a local storage or other off-site options. This feature is also referred to as SQL Server Backup to URL.

Reference: SQL Server Managed Backup to Windows Azure

---

### **Question: 5**

---

You need to implement changes to the system to reduce contention and improve performance of the SalesOrderDetail table.

Which three actions should you perform? Each correct answer presents part of the solution. Choose three.

- A. Use (SNAPSHOT) hints in the report queries
- B. ALTER DATABASE [ProdDB] SET READ\_COMMITTED\_SNAPSHOT ON
- C. ALTER DATABASE [ProdDB] SET READ\_COMMITTED\_SNAPSHOT OFF
- D. SET TRANSACTION ISOLATION LEVEL SNAPSHOT
- E. Use (TABLOCK) hints in the report queries
- F. SET TRANSACTION ISOLATION LEVEL SERIALIZABLE
- G. ALTER DATABASE [ProdDB] SET ALLOW\_SNAPSHOT\_ISOLATION ON
- H. Use (SNAPSHOT) hints in the update statements

---

### **Answer: A, B, F**

---

Explanation:

\* Scenario:

The SalesOrderDetail table holds the details about each sale. It is in the Sales schema owned by the SalesStaff Windows group.

This table is constantly being updated, inserted into, and read.

\* Regardless of which office runs a sales force report, the SalesOrderDetail table should only return valid, committed order data; any orders not yet committed should be ignored.

\* READ\_COMMITTED\_SNAPSHOT { ON | OFF }

ON

Enables Read-Committed Snapshot option at the database level. When it is enabled, DML statements start generating row versions even when no transaction uses Snapshot Isolation. Once this option is enabled, the transactions specifying the read committed isolation level use row versioning instead of locking. When a transaction runs at the read committed isolation level, all statements see a snapshot of data as it exists at the start of the statement.

OFF

Turns off Read-Committed Snapshot option at the database level. Transactions specifying the READ COMMITTED isolation level use locking.

ALTER DATABASE SET Options (Transact-SQL)

SET Statements (Transact-SQL)

---

### **Question: 6**

---

DRAG DROP

The business requires a satellite office to have a local copy of the data to report against.

You want to implement a solution to support the requirements. You need to establish a new Availability Group between the two servers.

Develop the solution by selecting and arranging the required code blocks in the correct order. You may not need all of the code blocks.

Code Blocks	Answer Area
<pre>EXEC master.dbo.sp_addlinkedserver @server = N'SATELLITE_SERVER', @srvproduct=N'SQL Server'</pre>	
<pre>CREATE ENDPOINT [Hadr_endpoint] STATE = STARTED AS TCP (LISTENER_PORT = 5022) FOR DATA_MIRRORING (ROLE = ALL)</pre>	
<pre>ALTER AVAILABILITY GROUP [ProdDB_AG] JOIN;</pre>	
<pre>CREATE AVAILABILITY GROUP [ProdDB_AG] FOR DATABASE [ProdDB] REPLICA ON N'HQ_Server' WITH (ENDPOINT_URL = N'TCP:// HQ_Server.OurDomain.com:5022', FAILOVER_MODE = MANUAL, AVAILABILITY_MODE = ASYNCHRONOUS_COMMIT, SECONDARY_ROLE(ALLOW_CONNECTIONS = READ_ONLY)), N'Satellite_Server' WITH (ENDPOINT_URL = N'TCP:// Satellite_Server.OurDomain.com:5022', FAILOVER_MODE = MANUAL, AVAILABILITY_MODE = ASYNCHRONOUS_COMMIT, SECONDARY_ROLE(ALLOW_CONNECTIONS = READ_ONLY));</pre>	
<pre>CREATE ENDPOINT sql_endpoint STATE = STARTED AS HTTP( PATH = '/alwayson', AUTHENTICATION = ( INTEGRATED ), PORTS = ( CLEAR ), SITE = 'SERVER');</pre>	
<pre>CREATE AVAILABILITY GROUP [ProdDB_AG] FOR DATABASE [ProdDB] REPLICA ON N'HQ_Server' WITH (ENDPOINT_URL = N'TCP:// HQ_Server.OurDomain.com:5022', FAILOVER_MODE = MANUAL, AVAILABILITY_MODE = SYNCHRONOUS_COMMIT, SECONDARY_ROLE(ALLOW_CONNECTIONS = READ_ONLY)), N'Satellite_Server' WITH (ENDPOINT_URL = N'TCP:// Satellite_Server.OurDomain.com:5022', FAILOVER_MODE = MANUAL, AVAILABILITY_MODE = SYNCHRONOUS_COMMIT, SECONDARY_ROLE(ALLOW_CONNECTIONS = READ_ONLY));</pre>	
<pre>ALTER AVAILABILITY GROUP [ProdDB_AG] ADD LISTENER N'ProdDB_AG_Listener' ( WITH PORT=1433);</pre>	
<pre>ALTER DATABASE [ProdDB] SET HADR AVAILABILITY GROUP = [ProdDB_AG];</pre>	
<pre>RESTORE DATABASE [ProdDB] FROM DISK = N'\\FILESERVER\SQLbackups\ProdDB.bak'</pre>	
<pre>BACKUP LOG [ProdDB] TO DISK = N'\\FILESERVER\SQLbackups \ProdDB.trn' WITH NORECOVERY</pre>	

Answer:

Box 1:

```
EXEC master.dbo.sp_addlinkedserver @server
= N'SATELLITE_SERVER', @srvproduct=N'SQL Server'
```

Box 2:

```
CREATE ENDPOINT [Hadr_endpoint]
STATE = STARTED AS TCP (LISTENER_PORT =
5022)
FOR DATA_MIRRORING (ROLE = ALL)
```

Box 3:

```
CREATE AVAILABILITY GROUP [ProdDB_AG]
FOR DATABASE [ProdDB] REPLICA ON
N'HQ_Server' WITH
(ENDPOINT_URL = N'TCP://
HQ_Server.OurDomain.com:5022',
FAILOVER_MODE = MANUAL,
AVAILABILITY_MODE =
ASYNCHRONOUS_COMMIT,
SECONDARY_ROLE(ALLOW_CONNECTIONS =
READ_ONLY)),
N'Satellite_Server' WITH
(ENDPOINT_URL = N'TCP://
Satellite_Server.OurDomain.com:5022',
FAILOVER_MODE = MANUAL,
AVAILABILITY_MODE =
ASYNCHRONOUS_COMMIT,
SECONDARY_ROLE(ALLOW_CONNECTIONS =
READ_ONLY));
```

Box 4:

```
ALTER AVAILABILITY GROUP
[ProdDB_AG] JOIN;
```

Box 5:

```
BACKUP LOG [ProdDB] TO
DISK = N'\\FILESERVER\SQLbackups
\ProdDB.trn'
WITH NORECOVERY
```

Box 6:

```
RESTORE DATABASE [ProdDB] FROM DISK =
N'\\FILESERVER\SQLbackups\ProdDB.bak'
```

Box 7:

```
ALTER DATABASE [ProdDB] SET HADR
AVAILABILITY GROUP = [ProdDB_AG];
```

**Explanation:**

**Note:**

\* The following table lists the basic tasks involved in creating and configuring an availability group and indicates which Transact-SQL statements to use for these tasks. The AlwaysOn Availability Groups tasks must be performed in the sequence in which they are presented in the table.

(step 2) Create database mirroring endpoint (once per SQL Server instance)

```
CREATE ENDPOINT endpointName ... FOR DATABASE_MIRRORING
```

(step 3) Create availability group

```
CREATE AVAILABILITY GROUP
```

(step 4) Join secondary replica to availability group

```
ALTER AVAILABILITY GROUP group_name JOIN
```

(step 5-6)

Prepare the secondary database

BACKUP and RESTORE.

Create backups on the server instance that hosts the primary replica.

Restore backups on each server instance that hosts a secondary replica, using RESTORE WITH NORECOVERY.

(step 7)

Start data synchronization by joining each secondary database to availability group

ALTER DATABASE database\_name SET HADR AVAILABILITY GROUP = group\_name  
Reference: Create an Availability Group (Transact-SQL)

---

### **Question: 7**

You need to change the ProdDB database.

Which two database options should you change to meet the requirements? Each correct answer presents part of the solution. Choose two.

- A. CONTAINS FILESTREAM
- B. Change recovery model to FULL
- C. CONTAINMENT = PARTIAL
- D. Change recovery model to BULK\_LOGGED
- E. COLLATE INMEMORY
- F. CONTAINS MEMORY OPTIMIZED DATA

---

**Answer: E, F**

---

Explanation:

\* Scenario: To help with performance, the database needs to be modified so that it can support in-memory data, specifically for the Product table, which the CIO has indicated should be a memory-optimized table.

Collations and Code Pages

FileGroupDefinition.ContainsMemoryOptimizedData Property (Microsoft.SqlServer.TransactSql.ScriptDom)

---

### **Question: 8**

DRAG DROP

You need to create a job to automate some database maintenance tasks.

Which code fragment should you use in each location in the command to complete one of the commands you will need to include in the job? To answer, drag the appropriate lines of code to the correct locations in the command. Each line of code may be used once, more than once, or not at all. You may need to drag the split bar between panes or scroll to view content.

Lines of Code	Answer Area
STATISTICS	UPDATE <input type="text"/> Line of Code <input type="text"/> Production.Product
CONSTRAINT	
MEMBER	<input type="text"/> Line of Code , <input type="text"/> Line of Code
WITH FULLSCAN	
WITH SAMPLE 50 PERCENT	
WITH SAMPLE 1000 ROWS	
RECOMPUTE	
NOCOMPUTE	
NORECOMPUTE	

**Answer:**

UPDATE  STATISTICS  Production.Product  
 WITH FULLSCAN  ,  NORECOMPUTE

**Explanation:****Note:**

UPDATE STATISTICS WITH FULLSCAN NORECOMPUTE

Update statistics by using FULLSCAN and NORECOMPUTE

The following example updates the Products statistics in the Product table, forces a full scan of all rows in the Product table, and turns off automatic statistics for the Products statistics.

USE AdventureWorks2012;

GO

UPDATE STATISTICS Production.Product(Products)

WITH FULLSCAN, NORECOMPUTE;

GO

UPDATE STATISTICS (Transact-SQL)

**Question: 9****DRAG DROP**

You need to create the CustomerAccess table to support the reporting and performance requirements.

Develop the solution by selecting and arranging the required code blocks in the correct order. You may not need all of the code blocks.

Code Blocks	Answer Area
CREATE TABLE [CustomerAccess] ON [CustomerAccessFG] (	
CustomerAccessID INT IDENTITY(1, 1) NOT NULL PRIMARY KEY , CustomerID INT NOT NULL , LoginDate DATETIME NOT NULL , LogoffDate DATETIME NULL	
CREATE TABLE [CustomerAccess] (	
ALTER DATABASE [ProdDB] ADD FILE (NAME = N'ProdDB_CustomerAccess', FILEN AME = N'F:\Data \ProdDB_CustomerAccess.ndf') TO FILEGRO UP [CustomerAccessFG]	
ALTER DATABASE [ProdDB] ADD FILE (NAME = N'ProdDB_CustomerAccess', FILEN AME = N'D:\Data \ProdDB_CustomerAccess.ndf') TO FILEGRO UP [CustomerAccessFG]	
) ON [ProdDB_CustomerAccess]	
) ON [CustomerAccessFG]	
ALTER DATABASE [ProdDB] ADD FILE (NAME = N'ProdDB_CustomerAccess', FILEN AME = N'D:\Data \ProdDB_CustomerAccess.ndf')	
)	
ALTER DATABASE [ProdDB] ADD FILEGROUP [CustomerAccessFG]	

---

**Answer:**

---

Box 1:

```
ALTER DATABASE [ProdDB] ADD FILEGROUP  
[CustomerAccessFG]
```

Box 2:

```
ALTER DATABASE [ProdDB] ADD FILE  
(NAME = N'ProdDB_CustomerAccess', FILEN  
AME = N'F:\Data  
\ProdDB_CustomerAccess.ndf') TO FILEGRO  
UP [CustomerAccessFG]
```

Box 3:

```
CREATE TABLE [CustomerAccess]  
ON [CustomerAccessFG] (
```

Box 4:

```
CustomerAccessID INT IDENTITY(1, 1)  
NOT NULL PRIMARY KEY  
, CustomerID INT NOT NULL  
, LoginDate DATETIME NOT NULL  
, LogoffDate DATETIME NULL
```

Box 5:

) ON [CustomerAccessFG]

Explanation:

Note:

\* Scenario: During your investigation, you discover that the sales force reports are causing significant contention.

\* Step 1: add filegroup

\* Step 2: add file

\* Step 3: create table on filegroup

/ CREATE TABLE ON { <partition\_scheme> | filegroup | "default" }

Specifies the partition scheme or filegroup on which the table is stored.

ALTER DATABASE File and Filegroup Options (Transact-SQL)

CREATE TABLE (SQL Server)

### **Question: 10**

You need to configure security on the Product table for customer support representatives.

Which two actions should you perform? Each correct answer presents part of the solution. Choose two.

- A. Create a view called CustProduct that includes columns ProductID, ProductName, Product Description, QuantityOnHand, ProductPrice, ProductCost, and ProductSupplierID.
- B. GRANT ALL on CustProduct TO OurDomain\CustomerSupport.
- C. Create a user-defined data type called CustProduct that includes columns ProductID, ProductName, Product Description, and ProductPrice.
- D. Create a view called CustProduct that includes columns ProductID, ProductName, Product Description, QuantityOnHand, and ProductPrice.
- E. GRANT SELECT on CustProduct TO OurDomain\CustomerSupport.
- F. GRANT SELECT on CustProduct TO public.

---

**Answer: A, E**

---

Explanation:

Give access to CustomerSupport through a view. The view must include all these columns (refer to scenario).

GRANT Object Permissions (Transact-SQL)

### **Question: 11**

You need to recommend a solution to back up DB1.

What should you include in the recommendation?

- A. Azure Table Storage
- B. Azure Queue storage
- C. Azure Blob storage
- D. Azure Document DB

---

**Answer: C**

---

Explanation:

For SQL Server the Azure Blob Storage service offers a better alternative to the often used tape option to archive backups. Tape storage might require physical transportation to an off-site facility and measures to protect the media.

Storing your backups in Azure Blob Storage provides an instant, highly available, and a durable archiving option.

Reference: How to Use Azure Storage for SQL Server Backup and Restore

<https://azure.microsoft.com/en-us/documentation/articles/storage-use-storage-sql-server-backup-restore/>

## Question: 12

What should you create in Azure to support the creation of the backups for DB1?

- A. an Azure Content Delivery Network (CDN) endpoint
- B. a Service Bus namespace
- C. a storage account
- D. a cloud service

**Answer: C**

## Case Study: 4

### A.Datum

#### Overview

#### General Overview

A. Datum Corporation has offices in Miami and Montreal.

The network contains a single Active Directory forest named adatum.com. The offices connect to each other by using a WAN link that has a 5-ms latency.

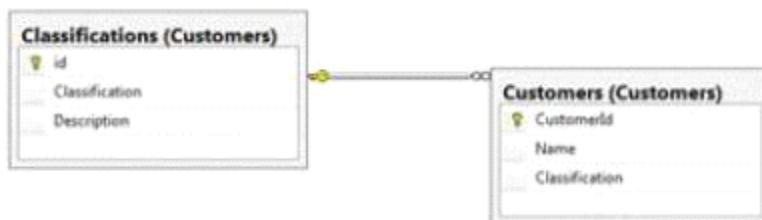
A. Datum standardizes its database platform by using SQL Server 2014 Standard edition.

#### Databases

Each office contains databases named Sales, Inventory, Customers, Products, Personnel, and Dev.

Servers and databases are managed by a team of database administrators. Currently, all of the database administrators have the same level of permissions on all of the servers and all of the databases.

The Customers database contains two tables named Customers and Classifications. The following graphic shows the relevant portions of the tables:



The following table shows the current data in the Classifications table:

<b>id</b>	<b>Classification</b>	<b>Description</b>
1	Platinum	Yearly sales over 1,000,000
2	Gold	Yearly sales over 500,000
3	Silver	Yearly sales over 100,000

The Inventory database is used mainly for reports. The database is recreated every day. A full backup of the database currently takes three hours to complete.

#### Stored Procedures

A stored procedure named USP\_1 generates millions of rows of data for multiple reports. USP\_1 combines data from five different tables from the Sales and Customers databases in a table named Table1.

After Table1 is created, the reporting process reads data from a table in the Products database and searches

for information in Table1 based on input from the Products table. After the process is complete, Table1 is deleted.

A stored procedure named USP\_2 is used to generate a product list. USP\_2 takes several minutes to run due to locks on the tables the procedure accesses.

A stored procedure named USP\_3 is used to update prices. USP\_3 is composed of several UPDATE statements called in sequence from within a transaction. Currently, if one of the UPDATE statements fails, the stored procedure continues to execute.

A stored procedure named USP\_4 calls stored procedures in the Sales, Customers, and Inventory databases. The nested stored procedures read tables from the Sales, Customers, and Inventory databases. USP\_4 uses an EXECUTE AS clause.

A stored procedure named USP\_5 changes data in multiple databases. Security checks are performed each time USP\_5 accesses a database.

You suspect that the security checks are slowing down the performance of USP\_5.

All stored procedures accessed by user applications call nested stored procedures. The nested stored procedures are never called directly.

## **Design Requirements**

### **Data Recovery**

You must be able to recover data from the Inventory database if a storage failure occurs. You have a Recovery Point Objective (RPO) of one hour.

You must be able to recover data from the Dev database if data is lost accidentally. You have a Recovery Point Objective (RPO) of one day.

### **Classification Changes**

You plan to change the way customers are classified. The new classifications will have four levels based on the number of orders. Classifications may be removed or added in the future.

Management requests that historical data be maintained for the previous classifications.

### **Security**

A group of junior database administrators must be able to view the server state of the SQL Server instance that hosts the Sales database. The junior database administrators will not have any other administrative rights.

A. Datum wants to track which users run each stored procedure.

### **Storage**

A. Datum has limited storage. Whenever possible, all storage space should be minimized for all databases and all backups.

### **Error Handling**

There is currently no error handling code in any stored procedure. You plan to log errors in called stored procedures and nested stored procedures. Nested stored procedures are never called directly.

---

## **Question: 1**

---

You need to recommend a solution to minimize the amount of time it takes to execute USP\_2.

What should you recommend?

- A. A database snapshot
- B. A table variable

- C. A temporary table
- D. Snapshot isolation

---

**Answer: C**

Explanation:

Scenario: A stored procedure named USP\_2 is used to generate a product list. USP\_2 takes several minutes to run due to locks on the tables the procedure accesses.

Reference: CREATE TABLE (SQL Server)

---

### **Question: 2**

You need to recommend a solution for the error handling of USP\_3. The solution must minimize the amount of custom code required.

What should you recommend?

- A. Use the @@ERROR variable in the nested stored procedures.
- B. Use a TRY CATCH block in the called stored procedures.
- C. Use the @@ERROR variable in the called stored procedures.
- D. Use the RAISERROR command in the nested stored procedures.

---

**Answer: B**

Explanation:

\* Must catch and handle the error.

\* Scenario: A stored procedure named USP\_3 is used to update prices. USP\_3 is composed of several UPDATE statements called in sequence from within a transaction. Currently, if one of the UPDATE statements fails, the stored procedure continues to execute.

Reference: TRY...CATCH (Transact-SQL)

---

### **Question: 3**

You need to recommend a solution to minimize the amount of time it takes to execute USP\_1.

With what should you recommend replacing Table1?

- A. An indexed view
- B. A function
- C. A table variable
- D. A temporary table

---

**Answer: D**

Explanation:

Scenario: A stored procedure named USP\_1 generates millions of rows of data for multiple reports. USP\_1 combines data from five different tables from the Sales and Customers databases in a table named Table1.

After Table1 is created, the reporting process reads data from a table in the Products database and searches for information in Table1 based on input from the Products table. After the process is complete, Table1 is deleted.

Reference: CREATE TABLE (SQL Server)

---

#### **Question: 4**

---

You need to recommend a disaster recovery solution for the Dev database.  
What should you include in the recommendation?

- A. The simple recovery model and full backups
- B. The bulk-logged recovery model and full backups
- C. The full recovery model, full backups, and differential backups
- D. The full recovery model, full backups, and transaction log backups

---

**Answer: A**

---

Explanation:

- \* Scenario: You must be able to recover data from the Dev database if data is lost accidentally. You have a Recovery Point Objective (RPO) of one day.
- \* The simple recovery model provides the simplest form of backup and restore. This recovery model supports both database backups and file backups, but does not support log backups. Transaction log data is backed up only with the associated user data. The absence of log backups simplifies managing backup and restore. However, a database can be restored only to the end of the most recent backup.

Incorrect:

Not B: The bulk-logged recovery model is a special-purpose recovery model that should be used only intermittently to improve the performance of certain large-scale bulk operations, such as bulk imports of large amounts of data.

Reference: Recovery Models (SQL Server)

---

#### **Question: 5**

---

You need to recommend a disaster recovery strategy for the Inventory database.  
What should you include in the recommendation?

- A. Log shipping
- B. SQL Server Failover Clustering
- C. AlwaysOn availability groups
- D. Peer-to-peer replication

---

**Answer: A**

---

Explanation:

- \* Scenario  
/ You must be able to recover data from the Inventory database if a storage failure occurs. You have a Recovery Point Objective (RPO) of one hour.
- / A. Datum Corporation has offices in Miami and Montreal.
- \* SQL Server Log shipping allows you to automatically send transaction log backups from a primary database on a primary server instance to one or more secondary databases on separate secondary server instances. The transaction log backups are applied to each of the secondary databases individually.

Reference: About Log Shipping (SQL Server)

---

#### **Question: 6**

---

You need to recommend a solution to meet the security requirements of the junior database administrators.  
What should you include in the recommendation?

- A. A server role
- B. A database role
- C. A credential
- D. A shared login

---

**Answer: C**

Explanation:

- \* Scenario: A group of junior database administrators must be able to view the server state of the SQL Server instance that hosts the Sales database. The junior database administrators will not have any other administrative rights.
- \* Credentials provide a way to allow SQL Server Authentication users to have an identity outside of SQL Server. Credentials can also be used when a SQL Server Authentication user needs access to a domain resource, such as a file location to store a backup.

Reference: Create a Credential

---

### **Question: 7**

You need to recommend a solution to ensure that USP\_4 adheres to the security requirements.  
What should you include in the recommendation?

- A. Enable SQL Server Audit.
- B. Enable trace flags.
- C. Configure data manipulation language (DML) triggers.
- D. Enable C2 audit tracing.

---

**Answer: A**

Explanation:

- \* Scenario: A stored procedure named USP\_4 calls stored procedures in the Sales, Customers, and Inventory databases. The nested stored procedures read tables from the Sales, Customers, and Inventory databases. USP\_4 uses an EXECUTE AS clause.
- \* Beginning in SQL Server 2008 Enterprise, you can set up automatic auditing by using SQL Server Audit.

Reference: SQL Server Audit (Database Engine)

---

### **Question: 8**

You need to recommend a solution to minimize the amount of time it takes to execute USP\_5.  
What should you include in the recommendation?

- A. Enable cross-database chaining.
- B. Use a server role to group all logins.
- C. Use the EXECUTE AS clause in USP\_5.
- D. Copy USP\_5 to each database.

---

**Answer: A**

Explanation:

- \* Scenario: A stored procedure named USP\_5 changes data in multiple databases. Security checks are performed each time USP\_5 accesses a database.

\* Cross-database ownership chaining occurs when a procedure in one database depends on objects in another database. A cross-database ownership chain works in the same way as ownership chaining within a single database, except that an unbroken ownership chain requires that all the object owners are mapped to the same login account. If the source object in the source database and the target objects in the target databases are owned by the same login account, SQL Server does not check permissions on the target objects.

Reference: [http://technet.microsoft.com/en-us/sqlserver/bb669059\(v=vs.71\).aspx](http://technet.microsoft.com/en-us/sqlserver/bb669059(v=vs.71).aspx)

---

### **Question: 9**

---

You need to recommend a solution for the planned changes to the customer classifications.

What should you recommend? (Each correct answer presents part of the solution. Choose all that apply.)

- A. Add a row to the Customers table each time a classification changes.
- B. Add columns for each classification to the Customers table.
- C. Add a table to track any changes made to the classification of each customer.
- D. Add a column to the Classifications table to track the status of each classification.
- E. Implement change data capture.

---

**Answer: C, D**

---

Explanation:

\* Scenario: You plan to change the way customers are classified. The new classifications will have four levels based on the number of orders. Classifications may be removed or added in the future.

Incorrect:

Not E: Change data capture provides information about DML changes on a table and a database. By using change data capture, you eliminate expensive techniques such as user triggers, timestamp columns, and join queries.

---

### **Question: 10**

---

You need to recommend a change to USP\_3 to ensure that the procedure completes only if all of the UPDATE statements complete.

Which change should you recommend?

- A. Set the XACT\_ABORT option to off
- B. Set the XACT\_ABORT option to on.
- C. Set the IMPLICIT\_TRANSACTIONS option to off.
- D. Set the IMPLICIT\_TRANSACTIONS option to on.

---

**Answer: B**

---

Explanation:

\* Scenario: A stored procedure named USP\_3 is used to update prices. USP\_3 is composed of several UPDATE statements called in sequence from within a transaction. Currently, if one of the UPDATE statements fails, the stored procedure continues to execute.

\* When SET XACT\_ABORT is ON, if a Transact-SQL statement raises a run-time error, the entire transaction is terminated and rolled back.

---

### **Question: 11**

---

You need to recommend a change to USP\_3 to ensure that the procedure continues to execute even if one of the

UPDATE statements fails.

Which change should you recommend?

- A. Set the XACT\_ABORT option to off.
- B. Set the XACT\_ABORT option to on.
- C. Set the IMPLICIT\_TRANSACTIONS option to off.
- D. Set the IMPLICIT\_TRANSACTIONS option to on.

---

**Answer: A**

---

Explanation:

- \* Scenario: A stored procedure named USP\_3 is used to update prices. USP\_3 is composed of several UPDATE statements called in sequence from within a transaction. Currently, if one of the UPDATE statements fails, the stored procedure continues to execute.
- \* When SET XACT\_ABORT is OFF, in some cases only the Transact-SQL statement that raised the error is rolled back and the transaction continues processing.

Reference: <http://msdn.microsoft.com/en-us/library/ms188792.aspx>

---

### **Question: 12**

---

You need to recommend a solution for the error handling of USP\_4. The solution must handle errors for nested stored procedures in the code for USP\_4.

What should you recommend?

- A. Use the @@ERROR variable in the nested stored procedures.
- B. Use the @@ERROR variable in USP\_4.
- C. Use the RAISERROR command in the nested stored procedures.
- D. Use the RAISERROR command in USP\_4.

---

**Answer: C**

---

Explanation:

- \* A stored procedure named USP\_4 calls stored procedures in the Sales, Customers, and Inventory databases. The nested stored procedures read tables from the Sales, Customers, and Inventory databases. USP\_4 uses an EXECUTE AS clause.

Reference: <http://msdn.microsoft.com/en-us/library/ms178592.aspx>

---

### **Question: 13**

---

You need to recommend a solution to minimize the amount of time it takes to execute USP\_1.

With what should you recommend replacing Table1?

- A. A view
- B. A temporary table
- C. A table variable
- D. A function

---

**Answer: A**

---

Explanation:

\* A stored procedure named USP\_1 generates millions of rows of data for multiple reports. USP\_1 combines data from five different tables from the Sales and Customers databases in a table named Table1.

CREATE TABLE (SQL Server)

## **Case Study: 5**

### **Mix Questions**

#### **Question: 1**

You are designing a Windows Azure SQL Database for an order fulfillment system. You create a table named Sales.Orders with the following script.

```
CREATE TABLE Sales.Orders
(
    OrderID int IDENTITY(1,1) NOT NULL PRIMARY KEY,
    OrderDate datetimeoffset NOT NULL,
    CustomerID int NOT NULL
);
```

Each order is tracked by using one of the following statuses:

Fulfilled  
Shipped  
Ordered  
Received

You need to design the database to ensure that you can retrieve the following information:

The current status of an order.  
The previous status of an order.  
The date when the status changed.  
The solution must minimize storage.

More than one answer choice may achieve the goal. Select the BEST answer.

- A. To the Sales.Orders table, add three columns named Status, PreviousStatus and ChangeDate. Update rows as the order status changes.
- B. Create a new table named Sales.OrderStatus that contains three columns named OrderID, StatusDate, and Status. Insert new rows into the table as the order status changes.
- C. Implement change data capture on the Sales.Orders table.
- D. To the Sales.Orders table, add three columns named FulfilledDate, ShippedDate, and ReceivedDate. Update the value of each column from null to the appropriate date as the order status changes.

---

**Answer: B**

---

#### **Question: 2**

You create a stored procedure that retrieves all of the rows from a table named Table1.

You need to recommend a solution to ensure that all of the statements in the stored procedure can be executed if another transaction is modifying rows in Table1 simultaneously.

What should you recommend?

- A. Snapshot isolation
- B. A database snapshot
- C. Filegroups

D. Indexes

---

**Answer: A**

---

Explanation:

Once snapshot isolation is enabled, updated row versions for each transaction are maintained in tempdb. A unique transaction sequence number identifies each transaction, and these unique numbers are recorded for each row version. The transaction works with the most recent row versions having a sequence number before the sequence number of the transaction. Newer row versions created after the transaction has begun are ignored by the transaction.

Reference: [Transaction Isolation Levels](#)

---

### **Question: 3**

---

You have a SQL Server instance on a server named Server1.

You need to recommend a solution to perform the following tasks every week:

Rebuild the indexes by using a new fill factor.

Run a custom T-SQL command.

Back up the databases.

What should you recommend?

More than one answer choice may achieve the goal. Select the BEST answer.

- A. A trigger
- B. An alert
- C. A maintenance plan
- D. Windows PowerShell
- E. A system policy

---

**Answer: C**

---

Explanation:

Maintenance plans create a workflow of the tasks required to make sure that your database is optimized, regularly backed up, and free of inconsistencies.

Reference: [Maintenance Plans](#)

---

### **Question: 4**

---

HOTSPOT

You use SQL Server 2014. You create a table within a database by using the following DDL:

```

CREATE TABLE OrderData
(
    OrderID INT IDENTITY(1,1) Primary Key Clustered,
    OrderDate SMALLDATETIME NOT NULL DEFAULT getdate(),
    CustomerID INT,
    IsTaxable INT,
    SubTotal SmallMoney DEFAULT (0),
    TaxAmount AS (Case IsTaxable when 1 then SubTotal * .0875 else NULL END),
    Freight SmallMoney,
    OrderReturnedDate DATE,
    OrderReturnedCustReason TEXT,
    OrderReturnedEval Varchar(MAX)
)

```

The following table illustrates a representative sample of data:

OrderID	OrderDate	CustomerID	IsTaxable	SubTotal	TaxAmount	Freight
1	11/13/2013 11:22	58465	NULL	\$ 25.99	NULL	\$ 5.40
2	11/15/2013 9:34	12588	NULL	\$ 42.00	NULL	NULL
3	12/1/2013 14:34	85477	NULL	\$ 23.99	NULL	\$ 4.85
4	12/17/2013 4:31	58742	NULL	\$ 19.00	NULL	NULL
5	1/3/2014 8:22	12477	NULL	\$ 13.50	NULL	\$ 5.40
6	1/5/2014 18:39	63214	NULL	\$ 5.69	NULL	NULL
7	1/15/2014 14:22	85471	NULL	\$ 18.99	NULL	\$ 7.85
8	1/19/2014 3:20	85412	NULL	\$ 65.77	NULL	NULL
9	1/22/2014 13:44	12588	NULL	\$ 22.38	NULL	\$ 7.35
10	1/28/2014 10:14	85471	1	\$ 24.99	\$ 2.19	\$ 5.40

The system is expected to handle 50 million orders a month over the next five years.

You have been instructed by your Team Lead to follow best practices for storage and performance in the utilization of SPARSE columns.

Which columns should you designate as SPARSE? To answer, mark each column as SPARSE or NOT SPARSE in the answer area.

### Answer Area

Column Names	Sparse	Not Sparse
OrderID	<input type="radio"/>	<input type="radio"/>
OrderDate	<input type="radio"/>	<input type="radio"/>
CustomerID	<input type="radio"/>	<input type="radio"/>
IsTaxable	<input type="radio"/>	<input type="radio"/>
SubTotal	<input type="radio"/>	<input type="radio"/>
TaxAmount	<input type="radio"/>	<input type="radio"/>
Freight	<input type="radio"/>	<input type="radio"/>

---

Answer:

---

**Answer Area**

Column Names	Sparse	Not Sparse
OrderID	<input type="radio"/>	<input checked="" type="radio"/>
OrderDate	<input type="radio"/>	<input checked="" type="radio"/>
CustomerID	<input type="radio"/>	<input checked="" type="radio"/>
IsTaxable	<input checked="" type="radio"/>	<input type="radio"/>
SubTotal	<input type="radio"/>	<input checked="" type="radio"/>
TaxAmount	<input checked="" type="radio"/>	<input type="radio"/>
Freight	<input checked="" type="radio"/>	<input type="radio"/>

Explanation:

Note:

Sparse columns are ordinary columns that have an optimized storage for null values. Sparse columns reduce the space requirements for null values at the cost of more overhead to retrieve nonnull values. Consider using sparse columns when the space saved is at least 20 percent to 40 percent.

Reference: [Use Sparse Columns](#)

**Question: 5**

DRAG DROP

You plan to deploy a database to SQL Azure.

You are designing two stored procedures named USP\_1 and USP\_2 that have the following requirements:

Prevent data read by USP\_1 from being modified by other active processes.

Allow USP\_2 to perform dirty reads.

You need to recommend the isolation level for the stored procedures.

The solution must maximize concurrency.

Which isolation levels should you recommend?

To answer, drag the appropriate isolation level to the correct stored procedure in the answer area.

Isolation Levels	Answer Area
read committed	SP1      Isolation level
read uncommitted	SP2      Isolation level
repeatable read	
serializable	

**Answer:**

Isolation Levels	Answer Area
read committed	SP1: repeatable read SP2: read uncommitted
serializable	

Explanation:

Note:

\* SP1: repeatable read

a repeatable read scan retains locks on every row it touches until the end of the transaction. Even rows that do not qualify for the query result remain locked. These locks ensure that the rows touched by the query cannot be updated or deleted by a concurrent session until the current transaction completes (whether it is committed or rolled back).

\* SP2: read uncommitted permits repeatable reads

Reference: [Transaction Isolation Levels](#)

## Question: 6

You use SQL Server 2014 to maintain the data used by applications at your company.

You want to execute two statements.

You need to guarantee that either both statements succeed, or both statements fail together as a batch.

Which code should you use?

- A. BEGIN TRY  
 INSERT TABLE1 (FIELD1) VALUES ('ONE')  
 INSERT TABLE2 (FIELD1) VALUES ('TWO')  
 END TRY  
 BEGIN CATCH  
 ROLLBACK TRANSACTION  
 THROW  
 END CATCH
- B. BEGIN TRY  
 INSERT TABLE1 (FIELD1) VALUES ('ONE')  
 INSERT TABLE2 (FIELD1) VALUES ('TWO')  
 END TRY  
 BEGIN CATCH  
 THROW  
 ROLLBACK TRANSACTION  
 END CATCH
- C. BEGIN TRANSACTION  
 INSERT TABLE1 (FIELD1) VALUES ('ONE')  
 INSERT TABLE2 (FIELD1) VALUES ('TWO')  
 IF @@ERROR = 0  
 COMMIT TRANSACTION  
 ELSE  
 ROLLBACK TRANSACTION
- D. BEGIN TRY  
 BEGIN TRANSACTION  
 INSERT TABLE1 (FIELD1) VALUES ('ONE')  
 INSERT TABLE2 (FIELD1) VALUES ('TWO')  
 COMMIT TRANSACTION  
 END TRY  
 BEGIN CATCH  
 ROLLBACK TRANSACTION  
 END CATCH
- E. BEGIN TRY  
 INSERT TABLE1 (FIELD1) VALUES ('ONE')  
 INSERT TABLE2 (FIELD1) VALUES ('TWO')  
 END TRY  
 BEGIN CATCH  
 THROW  
 END CATCH

- A. Option A  
 B. Option B  
 C. Option C  
 D. Option D  
 D. Option E

---

Answer: D

---

Explanation:  
 Structure should be:

```
BEGIN TRY  
BEGIN TRANSACTION  
COMMIT TRANSACTION  
END TRY  
BEGIN CATCH  
ROLLBACK TRANSACTION  
END CATCH.
```

Reference: [TRY...CATCH \(Transact-SQL\)](#)

---

### Question: 7

---

You deploy a SQL Server instance named SQLProd that uses SQL Server 2014.

You need to recommend a solution to monitor the transactions that are running currently against SQLProd. The solution must minimize the amount of custom code required.

What should you recommend?

- A. Statistics
- B. A dynamic management view
- C. A trigger
- D. User-defined views

---

**Answer: B**

---

Explanation:

Dynamic management views and functions return server state information that can be used to monitor the health of a server instance, diagnose problems, and tune performance.

Transactions can be monitored.

Reference: [Dynamic Management Views and Functions \(Transact-SQL\)](#)

---

### Question: 8

---

You have a SQL Azure database named Database1.

You need to design the schema for a table named table1. Table1 will have less than one million rows. Table1 will contain the following information for each row:

Column	Description
ID	An incremental numeric value used to identify the row
Name	A string in English
Code	An alphanumeric code that has five characters
ModifiedDate	The date of the last modification

The solution must minimize the amount of space used to store each row.

Which data types should you recommend for each column?

To answer, drag the appropriate data type to the correct column in the answer area.

Data Types	Answer Area
int	ID Data type
bigint	Name Data type
varchar	Code Data type
nvarchar	ModifiedDate Data type
char	
smalldatetime	
date	

**Answer:**

Data Types	Answer Area
	ID int
bigint	Name varchar
	Code char
nvarchar	ModifiedDate date
smalldatetime	

**Explanation:**[Data Types \(Transact-SQL\)](#)**Question: 9**

You have an SQL Server 2014 instance named SQL1.

SQL1 creates error events in the Windows Application event log.

You need to recommend a solution that will run an application when SQL1 logs a specific error in the Application log. Which SQL elements should you include in the recommendation? (Each correct answer presents part of the solution. Choose all that apply.)

- A. A policy
- B. A maintenance plan
- C. An alert
- D. A job
- E. A trigger

---

Answer: D, E

---

Explanation:

Use a trigger that starts a job which executes the application.

Reference: <http://technet.microsoft.com/en-us/library/hh849759.aspx>

---

### Question: 10

---

You have a database named DB1.

You plan to create a stored procedure that will insert rows into three different tables. Each insert must use the same identifying value for each table, but the value must increase from one invocation of the stored procedure to the next. Occasionally, the identifying value must be reset to its initial value.

You need to design a mechanism to hold the identifying values for the stored procedure to use.

What should you do?

More than one answer choice may achieve the goal. Select the BEST answer.

- A. Create a sequence object that holds the next value in the sequence. Retrieve the next value by using the stored procedure. Reset the value by using an ALTER SEQUENCE statement as needed.
- B. Create a sequence object that holds the next value in the sequence. Retrieve the next value by using the stored procedure. Increment the sequence object to the next value by using an ALTER SEQUENCE statement. Reset the value as needed by using a different ALTER SEQUENCE statement.
- C. Create a fourth table that holds the next value in the sequence. At the end each transaction, update the value by using the stored procedure. Reset the value as needed by using an UPDATE statement.
- D. Create an identity column in each of the three tables. Use the same seed and the same increment for each table. Insert new rows into the tables by using the stored procedure. Use the DBCC CHECKIDENT command to reset the columns as needed.

---

Answer: A

---

Explanation:

\* an application can obtain the next sequence number without inserting the row by calling the NEXT VALUE FOR function.

\* ALTER SEQUENCE

Includes argument:

RESTART [ WITH <constant> ]

The next value that will be returned by the sequence object. If provided, the RESTART WITH value must be an integer that is less than or equal to the maximum and greater than or equal to the minimum value of the sequence object. If the WITH value is omitted, the sequence numbering restarts based on the original CREATE SEQUENCE options.

\* CREATE SEQUENCE

Creates a sequence object and specifies its properties. A sequence is a user-defined schema bound object that generates a sequence of numeric values according to the specification with which the sequence was created. The sequence of numeric values is generated in an ascending or descending order at a defined interval and can be configured to restart (cycle) when exhausted.

[Sequence Numbers](#)

---

### Question: 11

---

Your network contains an Active Directory domain that has two groups named Group1 and Group2.

The domain contains two SQL Server instances named SQLDev and SQLProd. Each SQL Server instance has access to various storage media.

The SQL Server instances have a database that contains a table named Table1.

Table1 contains a column named Column1. The value for Column1 can be either Value1 or Value2.

You need to recommend a solution to ensure that users in Group1 can retrieve only rows from Column1 that contain the value of Value1.

What should you recommend?

- A. A dynamic management view
- B. Filegroups
- C. Snapshot isolation
- D. User-defined views

---

**Answer: D**

---

Explanation:

A view is a virtual table whose contents are defined by a query. Like a table, a view consists of a set of named columns and rows of data. Unless indexed, a view does not exist as a stored set of data values in a database. The rows and columns of data come from tables referenced in the query defining the view and are produced dynamically when the view is referenced.

A view acts as a filter on the underlying tables referenced in the view.

<http://msdn.microsoft.com/en-us/library/ms190174.aspx>

Incorrect:

Not A: Dynamic management views and functions return server state information that can be used to monitor the health of a server instance, diagnose problems, and tune performance.

[http://technet.microsoft.com/en-us/library/ms188754\(v=sql.120\).aspx](http://technet.microsoft.com/en-us/library/ms188754(v=sql.120).aspx)

---

## Question: 12

---

You have two SQL Server instances named SQLDev and SQLProd that have access to various storage media.

You plan to synchronize SQLDev and SQLProd.

You need to recommend a solution that meets the following requirements:

The database schemas must be synchronized from SQLDev to SQLProd.

The database on SQLDev must be deployed to SQLProd by using a package.

The package must support being deployed to Windows Azure SQL Database.

What should you recommend?

More than one answer choice may achieve the goal. Select the BEST answer.

- A. A database snapshot
- B. SQL Server Integration Services (SSIS)
- C. Change data capture
- D. A data-tier application

---

**Answer: B**

---

Explanation:

\* SSIS supports connections to SQL Database by using the ADO.NET provider. OLEDB is not supported at this time. You can build the SSIS package connecting to SQL Database and create the data flow tasks the same way as you would against a typical on-premise SQL Server.

Reference: [SSIS for Azure and Hybrid Data Movement](#)

---

## Question: 13

---

You manage a SQL Server 2014 instance that contains a database named DB1.

Users report that some queries to DB1 take longer than expected. Although most queries run in less than one second, some queries take up to 20 seconds to run.

You need to view all of the performance statistics for each database file.

Which method should you use?

- A. Query the sys.dm\_os\_tasks dynamic management view.
- B. Query the sys.dm\_os\_performance\_counters dynamic management view.
- C. Query the sys.dm\_io\_virtual\_file\_stats dynamic management function.
- D. Examine the Data File I/O pane in Activity Monitor.

---

**Answer: C**

---

Explanation:

sys.dm\_io\_virtual\_file\_stats

Returns I/O statistics for data and log files.

Reference: [sys.dm\\_io\\_virtual\\_file\\_stats \(Transact-SQL\)](#)

---

### Question: 14

---

DRAG DROP

You plan to deploy SQL Server 2014.

Your company identifies the following monitoring requirements for the database:

An e-mail message must be sent if the SQL Server Authentication mode changes.

An e-mail message must be sent if CPU utilization exceeds 90 percent.

You need to identify which feature meets each monitoring requirement.

Which features should you identify?

To answer, drag the appropriate feature to the correct monitoring requirement in the answer area.

Policy-Based Management

An e-mail message must be sent when a user logs in.

Feature

a SQL Server Agent alert

An e-mail message must be sent if CPU utilization exceeds 90 percent.

Feature

SQL Server Integration Services (SSIS)

trace flags

triggers

---

**Answer:**

---

Features	Answer Area
Policy-Based Management	An e-mail message must be sent if the SQL Server Authentication mode changes.
a SQL Server Agent alert	Policy-Based Management
SQL Server Integration Services (SSIS)	An e-mail message must be sent if CPU utilization exceeds 90 percent.
trace flags	a SQL Server Agent alert

#### Explanation:

- \* Policy-Based Management is helpful in resolving the issues presented in the following scenario:  
A company policy prohibits enabling Database Mail or SQL Mail. A policy is created to check the server state of those two features. An administrator compares the server state to the policy. If the server state is out of compliance, the administrator chooses the Configure mode and the policy brings the server state into compliance.
- \* Events are generated by SQL Server and entered into the Microsoft Windows application log. SQL Server Agent reads the application log and compares events written there to alerts that you have defined. When SQL Server Agent finds a match, it fires an alert, which is an automated response to an event. In addition to monitoring SQL Server events, SQL Server Agent can also monitor performance conditions and Windows Management Instrumentation (WMI) events.

To define an alert, you specify:

The name of the alert.

The event or performance condition that triggers the alert.

The action that SQL Server Agent takes in response to the event or performance condition.

Reference:

[Configure Alerts to Notify Policy Administrators of Policy Failures](#)

[SQL Server Agent](#)

#### Question: 15

You are the new database administrator for a SQL Server 2014 instance.

You conduct an assessment on the instance and determine that the auto create statistics setting on the database named DB1 has been turned off. You see no evidence that any maintenance has been occurring.

You want to set up monitoring to see if query performance is being affected.

You need to set up a monitoring process that will capture any cases where statistics could have been useful if they existed.

What should you do?

- A. Create a SQL Server Agent job to execute DBCC SHOWSTATISTICS on each of the primary key columns in the database.
- B. Use the missing\_column\_statistics extended event.
- C. Query the sys.statistics system view to see all cases where the statistics were last needed.

D. Write a query using the sys.dm\_db\_missing\_index\_group\_stats DMV Joining to sys.indexes, filtering on is\_hypothetical.

---

**Answer: B**

---

Explanation:

The Missing Column Statistics event class indicates that column statistics that could have been useful for the optimizer are not available.

By monitoring the Missing Column Statistics event class, you can determine if there are statistics missing for a column used by a query. This can cause the optimizer to choose a less efficient query plan than expected.

Reference: [Missing Column Statistics Event Class](#)

## Question: 16

---

DRAG DROP

You plan to deploy SQL Server 2014.

Your company identifies the following monitoring requirements:

Tempdb must be monitored for insufficient free space.

Deadlocks must be analyzed by using Deadlock graphs.

You need to identify which feature meets each monitoring requirement.

Which features should you identify?

To answer, drag the appropriate feature to the correct monitoring requirement in the answer area.

Features	Answer Area
dynamic management view	Tempdb must be monitored for insufficient free space.
Activity Monitor	Deadlocks must be analyzed by using Deadlock graphs.
Resource Governor	
SQL Trace	

---

**Answer:**

---

Tempdb must be monitored for insufficient free space.

dynamic management view

Deadlocks must be analyzed by using Deadlock graphs.

SQL Trace

**Explanation:**

\* You can use the sys.dm\_db\_file\_space\_usage dynamic management view to monitor the disk space used by the user objects, internal objects, and version stores in the tempdb files. Additionally, to monitor the page allocation or deallocation activity in tempdb at the session or task level, you can use the sys.dm\_db\_session\_space\_usage and sys.dm\_db\_task\_space\_usage dynamic management views. These views can be used to identify large queries, temporary tables, or table variables that are using a large amount of tempdb disk space.

\*

/ Use SQL Server Profiler to identify the cause of a deadlock. A deadlock occurs when there is a cyclic dependency between two or more threads, or processes, for some set of resources within SQL Server. Using SQL Server Profiler, you can create a trace that records, replays, and displays deadlock events for analysis.

/ SQL Server Profiler and SQL Server Management Studio use a deadlock wait-for graph to describe a deadlock. The deadlock wait-for graph contains process nodes, resource nodes, and edges representing the relationships between the processes and the resources.

Reference: [Troubleshooting Insufficient Disk Space in tempdb](#)

Reference: [Analyze Deadlocks with SQL Server Profiler](#)

---

### Question: 17

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**DRAG DROP**

You plan to deploy three highly available SQL Server environments that will use SQL Server 2014.

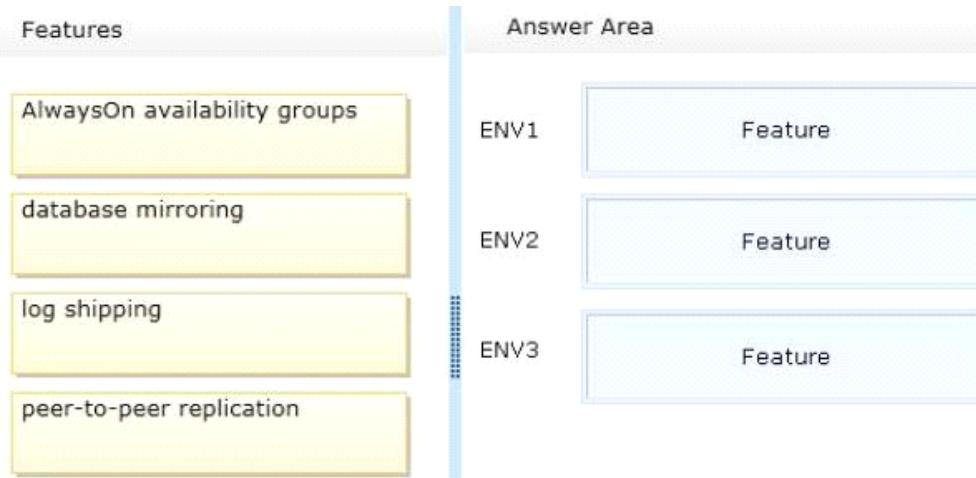
You identify the following specifications for each environment as shown following table.

Environment	Number of nodes	SQL Server edition	Automatic failover required
ENV1	3	Standard	Yes
ENV2	3	Enterprise	Yes
ENV3	4	Enterprise	Yes

You need to recommend which high-availability feature is required for each environment.

Which features should you identify?

To answer, drag the appropriate feature to the correct requirement in the answer area.




---

**Answer:**

---

Features	Answer Area
AlwaysOn availability groups	ENV1 database mirroring
database mirroring	ENV2 AlwaysOn availability groups
log shipping	ENV3 AlwaysOn availability groups
peer-to-peer replication	

Explanation:

- \* Always on availability groups

The AlwaysOn Availability Groups feature is a high-availability and disaster-recovery solution that provides an enterprise-level alternative to database mirroring. Introduced in SQL Server 2012, AlwaysOn Availability Groups maximizes the availability of a set of user databases for an enterprise.

Deploying AlwaysOn Availability Groups requires a Windows Server Failover Clustering (WSFC) cluster.

References:

[AlwaysOn Availability Groups \(SQL Server\)](#)

[Features Supported by the Editions of SQL Server 2014](#)

## Question: 18

DRAG DROP

You plan to deploy a database by using SQL Server 2014.

Your company identifies the following requirements for the database:

The name of all stored procedures must start with "usp\_"always.

All distribution statistics must be updated daily.

You need to identify which feature must be used to meet each database requirement.

Which features should you identify?

To answer, drag the appropriate feature to the correct database requirement in the answer area.

Features	Answer Area
change data capture	The name of all stored procedures must start with "usp_"always. Feature
the CHECK constraint	All distribution statistics must be updated daily. Feature
Extended Event	
a maintenance plan	
Policy-Based Management	

Answer:

Features	Answer Area	
change data capture	The name of all stored procedures must start with "usp_" always.	Policy-Based Management
the CHECK constraint	All distribution statistics must be updated daily.	a maintenance plan
Extended Event		

Explanation:

\* Policy-Based Management

Each Stored Procedure that are created and that will be created has to have prefix “USP\_”.

\* Maintenance plans create a workflow of the tasks required to make sure that your database is optimized, regularly backed up, and free of inconsistencies.

References:

[How to: Create and Configure a Policy-Based Management Policy](#)

[Maintenance Plans](#)

---

### Question: 19

---

You are troubleshooting an application that runs a query. The application frequently causes deadlocks.

You need to identify which transaction causes the deadlock.

What should you do?

More than one answer choice may achieve the goal. Select the BEST answer.

- A. Query the sys.dm\_exec\_sessions dynamic management view.
- B. Query the sys.dm\_exec\_requests dynamic management view.
- C. Create a trace in SQL Server Profiler that contains the Deadlock graph event
- D. Create an extended events session to capture deadlock information.

---

Answer: D

---

Explanation:

Troubleshooting deadlocks

You have been receiving reports from users indicating that certain applications are returning deadlock errors. To maximize the effectiveness of troubleshooting these problems, you decide to focus on the deadlocks that are hit most frequently. You create an Extended Events session that:

/ Configures deadlock event tracking for the session.

/ Specifies a target that aggregates based on an identifier for the deadlock.

You run the Extended Events session, and after additional deadlocks are reported you are able to obtain aggregated deadlock information, along with the complete XML deadlock graph for each source. Using this information you are able to pin point the most common deadlocks and start working on a solution.

[Create an Extended Events Session](#)

[View Event Session Data](#)

---

### Question: 20

---

**DRAG DROP**

You plan to deploy SQL Server 2014.

You identify the following security requirements for the deployment:

Users must be prevented from intercepting and reading the T-SQL statements sent from the clients to the database engine.

All database files and log files must be encrypted if the files are moved to another disk on another server.

You need to identify which feature meets each security requirement. The solution must minimize processor overhead.

Which features should you identify?

To answer, drag the appropriate feature to the correct requirement in the answer area.

Features	Answer Area
Encrypting File System (EFS)	Users must be prevented from intercepting and reading the T-SQL statements sent from the clients to the database engine.
Policy-Based Management	All database files and log files must be encrypted if the files are moved to another disk on another server.
Secure Socket Layer (SSL)	
Transparent Data Encryption (TDE)	
Windows BitLocker Drive Encryption (BitLocker)	

**Answer:**

Features	Answer Area
Encrypting File System (EFS)	Users must be prevented from intercepting and reading the T-SQL statements sent from the clients to the database engine.
Policy-Based Management	All database files and log files must be encrypted if the files are moved to another disk on another server.
Windows BitLocker Drive Encryption (BitLocker)	Secure Socket Layer (SSL) Transparent Data Encryption (TDE)

**Explanation:**

\* Secure Sockets Layer (SSL) encryption enables transmitting encrypted data across the network between an instance of SQL Server and a client application.

\* Transparent data encryption (TDE) performs real-time I/O encryption and decryption of the data and log files.

**References:**

[Authentication in Reporting Services](#)  
[Transparent Data Encryption \(TDE\)](#)

**Question: 21**

You have two databases named DB1 and DB2 that are located on the same server.

You plan to create a stored procedure named SProc1 in DB1.

SProc1 will query a table named Table2 in DB2.

You need to recommend a solution to ensure that SProc1 can access Table2 without granting users direct access to Table2.

What should you include in the recommendation?

More than one answer choice may achieve the goal. Select the BEST answer.

- A. Contained databases
- B. Application roles
- C. Cross-database ownership chaining
- D. Digital certificates

---

**Answer: B**

---

Explanation:

An application role is a database principal that enables an application to run with its own, user-like permissions. You can use application roles to enable access to specific data to only those users who connect through a particular application. Unlike database roles, application roles contain no members and are inactive by default.

Reference: [Application Roles](#)

---

## Question: 22

---

DRAG DROP

You are designing an authentication strategy for a new server that has SQL Server 2014 installed. The strategy must meet the following business requirements:

The account used to generate reports must be allowed to make a connection during certain hours only.

Failed authentication requests must be logged.

You need to recommend a technology that meets each business requirement. The solution must minimize the amount of events that are logged.

Which technologies should you recommend?

To answer, drag the appropriate solution to the correct business requirement in the answer area.

Technologies	Answer Area	
login auditing	The account used to generate reports must be allowed to make a connection during certain hours only.	Technology
logon triggers	Failed authentication requests must be logged.	Technology
C2 audit tracing		
Policy-Based Management		

---

**Answer:**

---

Technologies	Answer Area
	The account used to generate reports must be allowed to make a connection during certain hours only.
	Failed authentication requests must be logged.
C2 audit tracing	logon triggers
Policy-Based Management	login auditing

**Explanation:**

\* Logon triggers fire stored procedures in response to a LOGON event. This event is raised when a user session is established with an instance of SQL Server. Logon triggers fire after the authentication phase of logging in finishes, but before the user session is actually established.

You can use logon triggers to audit and control server sessions, such as by tracking login activity, restricting logins to SQL Server, or limiting the number of sessions for a specific login.

\* Login auditing can be configured to write to the error log on the following events.

Failed logins

Successful logins

Both failed and successful logins

**Incorrect:**

\* C2 audit mode can be configured through SQL Server Management Studio or with the c2 audit mode option in sp\_configure. Selecting this option will configure the server to record both failed and successful attempts to access statements and objects.

**References:**

[Logon Triggers](#)

[Configure Login Auditing \(SQL Server Management Studio\)](#)

---

**Question: 23**

You are creating a database that will store usernames and passwords for an application.

You need to recommend a solution to store the passwords in the database.

What should you recommend?

More than one answer choice may achieve the goal. Select the BEST answer.

- A. One-way encryption
- B. Encrypting File System (EFS)
- C. Transparent Data Encryption (TDE)
- D. Reversible encryption

---

---

**Answer: C**
**Explanation:**

\* Transparent Data Encryption (TDE) is a special case of encryption using a symmetric key. TDE encrypts an entire database using that symmetric key called the database encryption key. The database encryption key is protected by other keys or certificates which are protected either by the database master key or by an asymmetric key stored in an EKM module.

\* SQL Server provides the following mechanisms for encryption:

Transact-SQL functions

Asymmetric keys

Symmetric keys

Certificates

Transparent Data Encryption

Reference: [Transparent Data Encryption \(TDE\)](#)

## Question: 24

DRAG DROP

You need to recommend a backup process for data warehouse database.

The solution must meet the following requirements:

Ensure that if a hardware failure occurs, you can bring the database online without losing more than 24 hours of transactions.

Minimize the amount of administrative effort required to restore any lost data.

Minimize the space used by transaction logs.

What should you include in the recommendation?

To answer, move the appropriate actions from the list of actions to the answer area and arrange them in the correct order.

Actions	Work Area
Perform a weekly full backup of the database.	
Ship the logs to a secondary server.	
Set the database to the simple recovery model.	
Set the database to the full recovery model.	
Create a database snapshot.	
Perform a backup of the transaction log every hour.	
Perform a differential backup of the database every night.	

## Answer:

Box 1: Set the database to the simple recovery model.

Box 2: Perform a weekly full backup of the database.

Box 3: Perform a differential backup of the database every night.

Explanation:

Note:

\* Simple recovery model

No log backups.

\* Full recovery model

Requires log backups

Reference:

[Recovery Models \(SQL Server\)](#)

[Full Database Backups \(SQL Server\)](#)

[Differential Backups \(SQL Server\)](#)

## Question: 25

**DRAG DROP**

You plan to deploy a database to SQL Azure.

You must create two tables named Table 1 and Table 2 that will have the following specifications:

Table1 will contain a date column named Column1 that will contain a null value approximately 80 percent of the time.

Table2 will contain a column named Column2 which is the product of two other columns in Table2.

Both Table1 and Table2 will contain over one million rows.

You need to recommend which options must be defined for the columns. The solution must minimize the time it takes to retrieve data from the tables.

Which options should you recommend?

To answer, drag the appropriate options to the correct column in the answer area.

Options	Answer Area
Sparse	Column1 Option
Computed	Column2 Option
Persisted computed	

---

Options	Answer Area
	Column1 Sparse
	Column2 Persisted computed

**Answer:**

**Explanation:**

- \* Sparse columns are ordinary columns that have an optimized storage for null values. Sparse columns reduce the space requirements for null values at the cost of more overhead to retrieve nonnull values. Consider using sparse columns when the space saved is at least 20 percent to 40 percent.

- \* A Persisted column would be faster to retrieve.

- \* A computed column is computed from an expression that can use other columns in the same table. The expression can be a noncomputed column name, constant, function, and any combination of these connected by one or more operators.

Unless otherwise specified, computed columns are virtual columns that are not physically stored in the table. Their values are recalculated every time they are referenced in a query. The Database Engine uses the PERSISTED keyword in the CREATE TABLE and ALTER TABLE statements to physically store computed columns in the table. Their values are updated when any columns that are part of their calculation change.

References: [Use Sparse Columns](#)

[Specify Computed Columns in a Table](#)

**Question: 26**

You have a server named Server1 that has 16 processors.

You plan to deploy multiple instances of SQL Server 2014 to Server1.

You need to recommend a method to allocate processors to each instance.

What should you include in the recommendation?

More than one answer choice may achieve the goal. Select the BEST answer.

- A. Processor affinity
- B. Windows System Resource Manager (WSRM)
- C. Max Degree of Parallelism
- D. Resource Governor

---

**Answer: A**

---

Explanation:

CPU affinity management through Windows System Resource Manager is not recommended for SQL Server multi-instance management. Instead, use the processor affinity settings in SQL Server.

Reference: [Server Properties \(Processors Page\)](#)

### Question: 27

---

DRAG DROP

You need to recommend the actions that are required to partition a table.

In which order should the four actions be performed?

To answer, move the actions from the list of actions to the answer area and arrange them in the correct order.

Actions	Answer Area
Create a partition scheme.	
Create a partition function.	
Create filegroups.	
Create the table.	

---

**Answer:**

Create filegroups.

Create a partition function.

Create a partition scheme.

Create the table

Explanation:

Create a partitioned table using the AdventureWorks2012 database:

```
CREATE PARTITION FUNCTION TransactionRangePF1 (DATETIME)
```

```
AS RANGE RIGHT FOR VALUES
```

```
(  
    '20071001', '20071101', '20071201', '20080101',  
    '20080201', '20080301', '20080401', '20080501',  
    '20080601', '20080701', '20080801'  
);  
GO
```

```
CREATE PARTITION SCHEME TransactionsPS1 AS PARTITION TransactionRangePF1 TO
(
    [PRIMARY], [PRIMARY], [PRIMARY], [PRIMARY], [PRIMARY],
    [PRIMARY], [PRIMARY], [PRIMARY], [PRIMARY], [PRIMARY],
    [PRIMARY], [PRIMARY], [PRIMARY]
);
GO
CREATE TABLE dbo.TransactionHistory
(
    TransactionID      INT      NOT NULL, -- not bothering with IDENTITY here
    ProductID         INT      NOT NULL,
    ReferenceOrderID   INT      NOT NULL,
    ReferenceOrderLineID INT      NOT NULL DEFAULT (0),
    TransactionDate    DATETIME NOT NULL DEFAULT (GETDATE()),
    TransactionType    NCHAR(1) NOT NULL,
    Quantity          INT      NOT NULL,
    ActualCost        MONEY    NOT NULL,
    ModifiedDate       DATETIME NOT NULL DEFAULT (GETDATE()),
    CONSTRAINT CK_TransactionType
        CHECK (UPPER(TransactionType) IN (N'W', N'S', N'P'))
)
ON TransactionsPS1 (TransactionDate);
GO
Reference: Create Partitioned Tables and Indexes
```

---

### Question: 28

---

You have two SQL Server 2014 instances named SQLDev and SQLProd.

You plan to create a new database on SQLProd that will use SQL Server Authentication.

You need to ensure that when the new database is copied from SQLProd to SQLDev, users can connect to the database on SQLDev even if they do not have a login on the SQLDev instance.

What should you use?

More than one answer choice may achieve the goal. Select the BEST answer.

- A. Triggers
- B. Contained database
- C. SQL Server Analysis Services (SSAS) scripts
- D. Extended Events
- E. SQL Server Integration Services (SSIS) scripts

---

**Answer: B**

---

Explanation:

A fully contained database includes all the settings and metadata required to define the database and has no configuration dependencies on the instance of the SQL Server Database Engine where the database is installed.

Reference: [Contained Databases](#)

---

### Question: 29

---

DRAG DROP

You have two servers named SQL1 and SQL2 that have SQL Server 2012 installed. SQL1 contains a database that is mirrored asynchronously to SQL2. The database contents are updated once a month.

You need to upgrade the database to SQL Server 2014. The solution must minimize downtime.

Which upgrade steps should you recommend?

To answer, move the appropriate actions from the list of actions to the answer area and arrange them in the correct order.

Fail over.

Fail back.

Upgrade SQL1.

Upgrade SQL2.

Establish a mirror.

Break the mirror.

---

**Answer:**

---

Box 1: Fail over.

Box 2: Upgrade SQL1.

Box 3: Upgrade SQL2.

Box 4: Establish a mirror.

Explanation:

Note:

\* To perform the rolling upgrade

Step 1: For each mirroring session, whose mirror server instance has just been upgraded, wait for the session to synchronize. Then, connect to the principal server instance, and manually fail over the session.

Step 2: Upgrade each server instance that is now the mirror server in all mirroring sessions in which it is a partner.

Step 3: Resume the mirroring session.

\* When upgrading server instances to SQL Server 2014, you can reduce downtime for each mirrored database to only a single manual failover by performing a sequential upgrade, known as a rolling upgrade. A rolling upgrade is a multi-stage process that in its simplest form involves upgrading the server instance that is currently acting as the mirror server in a mirroring session, then manually failing over the mirrored database, upgrading the former principal server, and resuming mirroring

Reference: [Minimize Downtime for Mirrored Databases When Upgrading Server Instances](#)

---

**Question: 30**

---

You plan to create a database.

The database will be used by a Microsoft .NET application for a special event that will last for two days.

During the event, data must be highly available.

After the event, the database will be deleted.

You need to recommend a solution to implement the database while minimizing costs. The solution must not affect any existing applications.

What should you recommend?

More than one answer choice may achieve the goal. Select the BEST answer.

A. SQL Server 2014 Enterprise

B. SQL Server 2014 Standard

C. SQL Azure

D. SQL Server 2014 Express with Advanced Services

---

**Answer: B**

---

Explanation:

Programmability (AMO, ADOMD.Net, OLEDB, XML/A, ASSL) supported by Standard and Enterprise editions only.

Reference: [Features Supported by the Editions of SQL Server 2014](#)

### Question: 31

---

DRAG DROP

You have a server named SQL1 that has SQL Server 2014 installed. SQL1 hosts a database named Database1. Database1 contains a table named Table1. Table1 is partitioned across five filegroups based on the TransactionType field. The schema of Table1 is configured as shown in the following table.

Column	Data type
ID	Bigint
Account	Bigint
Amount	Decimal
TransactionType	Int
TransactionDate	Date

Table1 contains the indexes shown in the following table.

Index	Type	Column
PK_Table1	Clustered, primary key	ID, TransactionType
IX_Account	Nonclustered	Account
IX_Type	Nonclustered	TransactionType
IX_Date	Nonclustered	TransactionDate
IX_Amount	Nonclustered	Amount

You need to recommend an index strategy to maximize performance for the queries that consume the indexes available to Table1.

Which type of index storage should you recommend?

To answer, drag the appropriate index storage type to the correct index in the answer area.

<b>Index Storage Types</b>	
Aligned	IX_Type      Index Storage Type
Nonaligned	IX_Account      Index Storage Type
	IX_DATE      Index Storage Type
	IX_Amount      Index Storage Type

---

**Answer:**

---

IX_Type	Aligned
IX_Account	Nonaligned
IX_DATE	Nonaligned
IX_Amount	Nonaligned

Explanation:

Note:

Index Storage Type

\* Designing a partitioned index independently (unaligned) of the base table can be useful in the following cases:

/The base table has not been partitioned.

/The index key is unique and it does not contain the partitioning column of the table.

/ You want the base table to participate in collocated joins with more tables using different join columns.

#### Partitioned Tables and Indexes

### Question: 32

DRAG DROP

You are planning to deploy a database to Windows Azure SQL Database.

You need to design a stored procedure to update rows. The stored procedure must meet the following requirements:

If the update fails, an error must be raised to the application and the update must be discarded.

The stored procedure must be designed to maximize concurrency.

What should you include in your design?

To answer, move the appropriate actions from the list of actions to the answer area and arrange them in the correct order.

Actions	Work Area
Raise an error in a catch block.	
Commit the transaction in a finally block.	
Read the @@ROWCOUNT system variable.	
Perform the update in a try block.	
Raise an error and roll back the transaction if the row count is less than 1.	
Issue a SELECT statement to count the number of rows.	
Set the isolation level to serializable.	
Begin an explicit transaction.	

**Answer:**

Box 1: Begin an explicit transaction.

Box 2: Perform an update in a try block.

Box 3: Read the @@ROWCOUNT system variable.

Box 4: Raise an error and roll back the transaction if the row count is less than 1.

Box 5: Commit the transaction in a finally block.

Explanation:

Note:

\* Read Committed is SQL Server's default isolation level.

\* @@ROWCOUNT

eturns the number of rows affected by the last statement.

\* Using TRY...CATCH in a transaction

The following example shows how a TRY...CATCH block works inside a transaction. The statement inside the TRY block generates a constraint violation error.

```
BEGIN TRANSACTION;
```

```
BEGIN TRY
```

```
-- Generate a constraint violation error.
```

```
DELETE FROM Production.Product
```

```
WHERE ProductID = 980;
```

```
END TRY
```

```
BEGIN CATCH
```

```
SELECT  
    ERROR_NUMBER() AS ErrorNumber  
    ,ERROR_SEVERITY() AS ErrorSeverity  
    ,ERROR_STATE() AS ErrorState  
    ,ERROR_PROCEDURE() AS ErrorProcedure  
    ,ERROR_LINE() AS ErrorLine  
    ,ERROR_MESSAGE() AS ErrorMessage;
```

```
IF @@TRANCOUNT > 0
```

```
    ROLLBACK TRANSACTION;
```

```
END CATCH;
```

```
IF @@TRANCOUNT > 0
```

```
    COMMIT TRANSACTION;
```

```
GO
```

Reference: <http://msdn.microsoft.com/en-us/library/ms175976.aspx>

### **Question: 33**

DRAG DROP

You plan to deploy SQL Server 2012.

You are designing two stored procedures named USP\_1 and USP\_2 that have the following requirements:

Prevent data read by USP\_1 from being modified by other active processes.

Prevent USP\_2 from performing dirty reads.

You need to recommend the isolation level for each stored procedure. The solution must maximize concurrency.

Which isolation levels should you recommend?

To answer, drag the appropriate isolation level to the correct stored procedure in the answer area.

<b>Isolation Levels</b>		<b>Answer Area</b>	
read committed		USP_1	Isolation Level
read uncommitted		USP_2	Isolation Level
repeatable read			
serializable			

---

**Answer:**

---

USP\_1      repeatable read

USP\_2      read committed

**Explanation:**

**Note:**

\* REPEATABLE READ

This isolation level includes the guarantees given by SNAPSHOT isolation level. In addition, REPEATABLE READ guarantees that for any row that is read by the transaction, at the time the transaction commits the row has not been changed by any other transaction. Every read operation in the transaction is repeatable up to the end of the transaction.

\* Committed Read is SQL Server's default isolation level. It ensures that an operation will never read data another application has changed but not yet committed.

Reference: [Transaction Isolation Levels](#)

---

### Question: 34

---

DRAG DROP

You use SQL Server 2014.

You need to create a single object that inserts a provided value into Table1, and then returns a count of the records in Table1.

Develop the solution by selecting and arranging the required code blocks in the correct order. You may not need all of the code blocks.

Code Blocks	Answer Area
END	
CREATE FUNCTION dbo.Func_Table1 @InsertWord Varchar (10), @Var1 int OUTPUT AS BEGIN	
CREATE FUNCTION dbo.Func_Table1 (@InsertWord Varchar (10)) Returns INT AS BEGIN	
CREATE PROCEDURE dbo.Spr_Table1 @InsertWord Varchar (10), @Var1 INT AS BEGIN	
Select @Var1 = count(*) from TABLE1	
Declare @Var1 INT	
CREATE PROCEDURE dbo.Spr_Table1 @InsertWord Varchar (10), @Var1 int OUTPUT AS BEGIN	
INSERT INTO TABLE1 (FIELD1) values (@InsertWord)	

**Answer:**

Box 1:

```
CREATE PROCEDURE dbo.Spr_Table1 @InsertWord Varchar (10), @Var1 int OUTPUT AS BEGIN
```

Box 2:

```
INSERT INTO TABLE1 (FIELD1) values (@InsertWord)
```

Box 3:

```
Select @Var1 = count(*) from TABLE1
```

Box 4:

```
END
```

Explanation:

References:

<http://msdn.microsoft.com/en-us/library/ms187926.aspx>

<http://msdn.microsoft.com/en-us/library/ms345415.aspx>

**Question: 35**

You are building a stored procedure for a Windows Azure SQL Database. The procedure will add multiple rows to a table.

You need to design the stored procedure to meet the following requirements:

If any of the new rows violates a table constraint, then no further additions must be attempted and all changes made by the stored procedure must be discarded.

If any errors occur, a row must be added to an audit table, and the original error must be returned to the caller of the stored procedure.

What should you include in the design?

- A. An explicit transaction that has XACT\_ABORT disabled
- B. An implicit transaction that has error handling enabled
- C. An explicit transaction that has error handling enabled
- D. An implicit transaction that has XACT\_ABORT enabled

---

**Answer: C**

---

Explanation:

Reference:

[http://technet.microsoft.com/en-us/library/ms175127\(v=SQL.105\).aspx](http://technet.microsoft.com/en-us/library/ms175127(v=SQL.105).aspx)

---

**Question: 36**

---

DRAG DROP

You are the senior database administrator at Contoso, Ltd. You manage a SQL Server 2014 Instance, with multiple databases used for reporting.

You have recently hired a junior database administrator. You want this person to be able to view the database structures on the server, but you do not want him or her to be able to make changes or see the data in the tables.

The new hire's login credentials are as follows:

Login name: JFree

Password: Jx672\$qse

You want the new hire to be required to change his password on his next login.

The code that is produced should execute no matter the initial database context in which it is started.

You need to write the code required to give the new hire only the desired access, using the smallest number of steps.

Develop the solution by selecting and arranging the required code blocks in the correct order. You may not need all of the code blocks.

Code Blocks	Answer Area
USE Tempdb; CREATE LOGIN [JFree] WITH PASSWORD = 'Jx672\$qse' MUST_CHANGE, CHECK_EXPIRATION = ON;	
USE MASTER; CREATE LOGIN [JFree] WITH PASSWORD = 'Jx672\$qse' CHANGE ON LOGIN, CHECK_EXPIRATION = ON;	
GRANT VIEW SERVER STATE TO [JFree];	
USE Master; CREATE LOGIN [JFree] WITH PASSWORD = 'Jx672\$qse' MUST_CHANGE, CHECK_EXPIRATION = ON;	
ALTER SERVER ROLE [securityadmin] ADD MEMBER [JFree];	
GRANT CONNECT ANY DATABASE TO [JFree]; GRANT SELECT ALL USER SECURABLES TO [JFree];	
GRANT VIEW ANY DEFINITION TO [JFree]; GRANT CONNECT ANY DATABASE TO [JFree];	

---

**Answer:**

---

Box 1:

```
USE Master;  
CREATE LOGIN [JFree] WITH PASSWORD = 'Jx672$qse'  
MUST_CHANGE, CHECK_EXPIRATION = ON;
```

```
ALTER SERVER ROLE [securityadmin] ADD MEMBER  
[JFree];
```

Box 2:

```
GRANT VIEW ANY DEFINITION TO [JFree];
GRANT CONNECT ANY DATABASE TO [JFree];
```

Explanation:

Note:

\* MUST\_CHANGE

Applies to: SQL Server 2008 through SQL Server 2014.

Applies to SQL Server logins only. If this option is included, SQL Server prompts the user for a new password the first time the new login is used.

\* The VIEW DEFINITION permission lets a user see the metadata of the securable on which the permission is granted. However, VIEW DEFINITION permission does not confer access to the securable itself. For example, a user that is granted only VIEW DEFINITION permission on a table can see metadata related to the table in the sys.objects catalog view. However, without additional permissions such as SELECT or CONTROL, the user cannot read data from the table.

References:

[CREATE LOGIN \(Transact-SQL\)](#)

[ALTER SERVER ROLE \(Transact-SQL\)](#)

---

### Question: 37

You are creating a database that will store usernames and credit card numbers for an application.

You need to recommend a solution to store and reuse the credit card numbers in the database.

What should you recommend? More than one answer choice may achieve the goal. Select the BEST answer.

- A. Data encryption
- B. Transparent Data Encryption (TDE)
- C. Encrypting File System (EPS)
- D. Data hashing

---

**Answer: B**

---

Explanation:

If we are going to encrypt credit card number for storage, then we should have Data Encryption Key (DEK) for encrypting the credit card number.

Reference: <http://msdn.microsoft.com/en-us/library/bb934049.aspx>

---

### Question: 38

You have a query that is used by a reporting dashboard.

Users report that the query sometimes takes a long time to run.

You need to recommend a solution to identify what is causing the issue.

What should you recommend?

More than one answer choice may achieve the goal. Select the BEST answer.

- A. Set the blocked process threshold, and then run SQL Server Profiler.
- B. Set the blocked process threshold, and then create an alert.
- C. Enable trace flag 1204, and then create an alert.
- D. Create a job that queries the sys.dm\_os\_waiting\_tasks dynamic management view.

---

**Answer: B**

---

Explanation:

Step 1: Turn on the blocked process report. This will look for any blocking taking 20 seconds or longer.

--Make sure you don't have any pending changes

SELECT \*

FROM sys.configurations

WHERE value <> value\_in\_use;

GO

exec sp\_configure 'show advanced options', 1;

GO

RECONFIGURE

GO

exec sp\_configure 'blocked process threshold (s)', 20;

GO

RECONFIGURE

GO

Step 2: Set up a trace to capture the blocked process report. Run it as a server side trace.

Reference: [blocked process threshold Server Configuration Option](#)

---

### Question: 39

---

You are troubleshooting an application that runs a query. The application frequently causes deadlocks.

You need to identify the isolation level used by the query when a deadlock occurs.

What should you do?

More than one answer choice may achieve the goal. Select the BEST answer.

- A. Query the sys.dm\_exec\_requests dynamic management view.
- B. Create a trace in SQL Server Profiler that contains the Deadlock graph event.
- C. Query the sys.dm\_exec\_sessions dynamic management view.
- D. Enable trace flag 1222, and then view the SQL Server error log.

---

**Answer: C**

---

Explanation:

\* sys.dm\_exec\_sessions

Returns one row per authenticated session on SQL Server. sys.dm\_exec\_sessions is a server-scope view that shows information about all active user connections and internal tasks.

Include the column:

transaction\_isolation\_level

smallint

Transaction isolation level of the session.

0 = Unspecified

1 = ReadUncommitted

2 = ReadCommitted

3 = Repeatable

4 = Serializable

5 = Snapshot

Is not nullable.

Reference: [sys.dm\\_exec\\_sessions \(Transact-SQL\)](#)

---

### Question: 40

---

You have four databases that are accessed by using an Online Transaction Processing (OLTP) application. The databases are stored on a server named SQL1 that has SQL Server 2014 installed.

You plan to deploy an additional server that has SQL Server 2014 installed.

You need to design a high-availability solution for the databases that meets the following requirements:

If SQL1 fails, the databases must be available.

Users must be able to run reports against a secondary copy of the databases.

What should you include in the design?

More than one answer choice may achieve the goal. Select the BEST answer.

A. AlwaysOn availability groups

B. Database mirroring

C. Log shipping

D. Failover Clustering

---

**Answer: A**

---

Explanation:

The AlwaysOn Availability Groups feature is a high-availability and disaster-recovery solution that provides an enterprise-level alternative to database mirroring.

Introduced in SQL Server 2012, AlwaysOn Availability Groups maximizes the availability of a set of user databases for an enterprise. An availability group supports a failover environment for a discrete set of user databases, known as availability databases that fail over together.

Reference: [Failover and Failover Modes \(AlwaysOn Availability Groups\)](#)

---

### Question: 41

---

You administer a SQL Server 2014 instance.

Users report that the SQL Server has seemed slow today. A large database was being restored for much of the day, which could be causing issues.

You want to write a query of the system views that will report the following:

Number of users that have a connection to the server

Whether a user's connection is active

Whether any connections are blocked

What queries are being executed

Whether the database restore is still executing and, if it is, what percentage of the restore is complete.

Which system objects should you use in your query to best achieve this task?

A. sys.dm\_exec\_requests, sys.dm\_exec\_sessions, sys.objects

B. sys.dm\_exec\_sessions, sys.dm\_exec\_query\_stats, sys.dm\_exec\_query\_text, sys.objects

C. sys.sysprocesses, sys.dm\_exec\_query\_text, sys.objects

D. sys.dm\_exec\_requests, sys.dm\_exec\_sessions, sys.dm\_exec\_query\_text

---

**Answer: D**

---

Explanation:

\* sys.dm\_exec\_requests

Returns information about each request that is executing within SQL Server.

\* sys.dm\_exec\_sessions

Returns one row per authenticated session on SQL Server. sys.dm\_exec\_sessions is a server-scope view that shows

information about all active user connections and internal tasks. This information includes client version, client program name, client login time, login user, current session setting, and more.

\* `sys.dm_exec_query_text`

Returns the text of the SQL batch that is identified by the specified `sql_handle`.

References:

[sys.dm\\_exec\\_requests \(Transact-SQL\)](#)

[sys.dm\\_exec\\_sessions \(Transact-SQL\)](#)

Incorrect:

\* `sys.dm_exec_query_stats`

Returns aggregate performance statistics for cached query plans in SQL Server. The view contains one row per query statement within the cached plan, and the lifetime of the rows are tied to the plan itself.

\* `sys.objects`

Contains a row for each user-defined, schema-scoped object that is created within a database.

---

## Question: 42

---

You are designing a monitoring application for a new SQL Server 2014 instance.

You need to recommend a solution to generate a report that displays the 10 most frequent wait types that occur for the instance.

What should you include in the recommendation?

More than one answer choice may achieve the goal. Select the BEST answer.

- A. The SQL Server error log
- B. The `sys.dm_os_wait_stats` dynamic management view
- C. The `DBCC SQLPERF(WAITSTATS)` command
- D. SQL Server Profiler

---

**Answer: B**

---

Explanation:

`sys.dm_os_wait_stats`

Returns information about all the waits encountered by threads that executed. You can use this aggregated view to diagnose performance issues with SQL Server and also with specific queries and batches.

Columns include:

`waiting_tasks_count`

Number of waits on this wait type. This counter is incremented at the start of each wait.

Reference:

[sys.dm\\_db\\_wait\\_stats \(Windows Azure SQL Database\)](#)

---

## Question: 43

---

You have a database hosted on SQL Server 2012 R2. The database contains 5 million rows.

You need to recommend a repeatable method to migrate the database to SQL Azure.

Which method should you recommend? More than one answer choice may achieve the goal. Select the BEST answer.

- A. Create a SQL Server Integration Services (SSIS) package, and then run the package.
- B. Back up the database, and then restore the database.
- C. Extract a data-tier application, and then import the application.
- D. Generate scripts to create all of the all database objects and all of the data, and then execute the scripts by using SQL Azure.

---

**Answer: A**

---

Explanation:

SQL Server Integration Services

Most flexibility

Data Transfer Efficiency: Good

/ SSIS can be used to perform a broad range of data migration tasks. SSIS provides support for complex workflow and data transformation between the source and destination. It is a good choice to transfer of data for databases that require many changes to work on Microsoft Azure SQL Database. You can use SSIS data transfer packages with another mechanism for transferring the database schema, such as a Data-tier Application package.

[\*\*SSIS for Azure and Hybrid Data Movement\*\*](#)

Incorrect:

Not D: Generate Scripts Wizard

Has explicit option for Azure SQL Database scripts generation

Data Transfer Efficiency: Poor

Good for smaller database

/ Using the Generate Scripts wizard to migrate a SQL Server database to Azure SQL Database should be limited to:

Teams who have experience with the wizard.

Migrating simple databases that need few schema changes to run on Azure SQL Database. The scripts generated from the source database can be modified before being used to create the new version of the database on Azure SQL Database, but using a database project in the SQL Server Data Tools has richer support for making schema changes.

Migrating small databases that do not have much data. The wizard generates scripts that use insert statements instead of bulk copies to transfer the data. The insert statements can be throttled when the tables contain too much data, and are not as fast as bulk copies.

---

**Question: 44**

---

You are designing a database named DB1.

Changes will be deployed to DB1 every Wednesday night.

You need to recommend a strategy to deploy the changes to DB1. The strategy must meet the following requirements:

The strategy must not disrupt backup operations.

DB1 must be online while the changes are deployed.

You must be able to undo quickly any changes made to objects.

What should you recommend?

More than one answer choice may achieve the goal. Select the BEST answer.

- A. Perform a copy-only database backup before the changes are deployed. If the deployment fails, restore the database to another server and recover the original objects from the restored database.
- B. Create a database snapshot. If the deployment fails, recover the objects from the database snapshot.
- C. Create a database snapshot. If the deployment fails, revert the database to the database snapshot.
- D. Perform a full database backup before the changes are deployed. If the deployment fails, restore the database to another server and recover the original objects from the restored database.

---

**Answer: C**

---

Explanation:

Reference:

[\*\*Database Snapshots \(SQL Server\)\*\*](#)

## Question: 45

DRAG DROP

You plan to install two SQL Server 2014 environments named Environment1 and Environment.

Your company identifies the following availability requirements for each environment:

Environment1 must have mirroring with automatic failover implemented.

Environment2 must have AlwaysOn with automatic failover implemented.

You need to identify the minimum number of SQL Server 2014 servers that must be deployed to each environment to ensure that all data remains available if a physical server fails.

How many servers should you identify?

To answer, drag the appropriate number to the correct environment in the answer area.

Number of Servers	Answer Area
2	Environment1      Number of Server
3	Environment2      Number of Server
4	

Answer:

## Answer Area

Environment1

2

Environment2

2

Explanation:

References:

[Database Mirroring \(SQL Server\)](#)

[Failover and Failover Modes \(AlwaysOn Availability Groups\)](#)

## Question: 46

DRAG DROP

You are designing a database for a university.

The database will contain two tables named Classes and Enrollment that have the following specifications:

Classes will store brochures in the XPS format. The brochures must be structured in folders and must be accessible by using UNC paths.

Enrollment will store information about students and their classes. Performance must be enhanced for queries of the current enrollments.

You need to identify which SQL Server technology meets the specifications of each table.

Which technologies should you identify?

To answer, drag the appropriate technology to the correct table in the answer area.

Technologies	Answer Area
FileStream	Technology
FileTable	Technology
Partitioned tables	
Partitioned views	
...	

**Answer:**

**Classes**

**FileTable**

**Enrollment**

**Partitioned tables**

Explanation:

Note:

\* The FileTable feature brings support for the Windows file namespace and compatibility with Windows applications to the file data stored in SQL Server. FileTable lets an application integrate its storage and data management components, and provides integrated SQL Server services - including full-text search and semantic search - over unstructured data and metadata.

In other words, you can store files and documents in special tables in SQL Server called FileTables, but access them from Windows applications as if they were stored in the file system, without making any changes to your client applications.

References:

[FileTables \(SQL Server\)](#)

[Partitioned Tables and Indexes](#)

## Question: 47

You have a server that has SQL Server 2014 installed. The server contains 100 user databases.

You need to recommend a backup solution for the user databases.

The solution must meet the following requirements:

Perform a transaction log backup every hour.

Perform a full backup of each database every week.

Perform a differential backup of each database every day.

Ensure that new user databases are added automatically to the backup solution.

What should you recommend?

More than one answer choice may achieve the goal. Select the BEST answer.

- A. Policy-Based Management
- B. A Data Definition Language (DDL) trigger

- C. SQL Server Agent jobs
- D. A maintenance plan

---

**Answer: D**

**Explanation:**

Maintenance plans create a workflow of the tasks required to make sure that your database is optimized, regularly backed up, and free of inconsistencies.

Maintenance plans can be created to perform the following task (among others):

Back up the database and transaction log files. Database and log backups can be retained for a specified period. This lets you create a history of backups to be used if you have to restore the database to a time earlier than the last database backup. You can also perform differential backups.

Reference: [Maintenance Plans](#)

---

### **Question: 48**

---

You have a SQL Server 2014 database named DB1.

You plan to import a large number of records from a SQL Azure database to DB1.

You need to recommend a solution to minimize the amount of space used in the transaction log during the import operation.

What should you include in the recommendation?

- A. The bulk-logged recovery model
- B. The full recovery model
- C. A new partitioned table
- D. A new log file
- E. A new file group

---

**Answer: A**

**Explanation:**

Compared to the full recovery model, which fully logs all transactions, the bulk-logged recovery model minimally logs bulk operations, although fully logging other transactions. The bulk-logged recovery model protects against media failure and, for bulk operations, provides the best performance and least log space usage.

**Note:**

The bulk-logged recovery model is a special-purpose recovery model that should be used only intermittently to improve the performance of certain large-scale bulk operations, such as bulk imports of large amounts of data.

Reference: [Recovery Models \(SQL Server\)](#)

---

### **Question: 49**

---

You have a server named Server1 that has 2 processors.

You plan to deploy multiple instances of SQL Server 2014 to Server1. Each instance will have multiple databases.

You need to recommend a method to allocate processor time to each database.

What should you include in the recommendation?

More than one answer choice may achieve the goal. Select the BEST answer.

- A. Resource Governor
- B. Max Degree of Parallelism
- C. Windows System Resource Manager (WSRM)

D. Processor affinity

---

**Answer: A**

---

Explanation:

SQL Server Resource Governor is a feature than you can use to manage SQL Server workload and system resource consumption. Resource Governor enables you to specify limits on the amount of CPU, physical IO, and memory that incoming application requests can use.

Reference: [Resource Governor](#)

Incorrect:

D: PROCESS AFFINITY

Enables hardware threads to be associated with CPUs.

---

### **Question: 50**

---

DRAG DROP

You use SQL Server 2014 Enterprise Edition. Your database contains a partitioned table named AuditData

a. AuditData is partitioned by year. Partition 1 contains data from the year 2010 and prior.

Management has decided to archive all AUDITDATA records from 2010 and prior. Management wants the records to be removed from the database entirely and provided to the backup team as a zipped text file. The data must no longer reside in the database. There is very little tolerance for performance degradation in your environment.

You need to remove all 2010 and prior data from the AuditData table by using the least amount of system resources possible.

Develop the solution by selecting and arranging the required SQL actions in the correct order.

You may not need all of the actions.

<b>SQL Actions</b>	<b>Answer Area</b>
Drop Table	
Select Into	
Switch Partition	
Move Partition	
Merge Range	
BCP	
Split Range	
Create Table	
Delete Partition	
Drop Partition	

---

**Answer:**

---

Box 1: CREATE TABLE

Box 2: SPLIT RANGE

Box 3: SELECT INTO

Box 4: BCP

Box 5: DROP TABLE

Box 6: DROP PARTITION

Explanation:

Note:

\* Create a new partitioned table with the partition function you want, and then insert the data from the old table into the new table by using an INSERT INTO...SELECT FROM statement.

\* SPLIT RANGE ( boundary\_value )

Adds one partition to the partition function. boundary\_value determines the range of the new partition, and must differ from the existing boundary ranges of the partition function. Based on boundary\_value, the Database Engine splits one of the existing ranges into two. Of these two, the one where the new boundary\_value resides is considered the new partition.

\* BCP can be used to produce the zipped text file.

\* Example:

Splitting a partition of a partitioned table or index into two partitions

The following example creates a partition function to partition a table or index into four partitions. ALTER PARTITION FUNCTION splits one of the partitions into two to create a total of five partitions.

CREATE PARTITION FUNCTION myRangePF1 (int)

AS RANGE LEFT FOR VALUES ( 1, 100, 1000 );

GO

--Split the partition between boundary\_values 100 and 1000

--to create two partitions between boundary\_values 100 and 500

--and between boundary\_values 500 and 1000.

ALTER PARTITION FUNCTION myRangePF1 ()

SPLIT RANGE (500);

References:

[http://technet.microsoft.com/en-us/library/ms186307\(v=sql.110\).aspx](http://technet.microsoft.com/en-us/library/ms186307(v=sql.110).aspx)

[http://technet.microsoft.com/en-us/library/ms162802\(v=sql.120\).aspx](http://technet.microsoft.com/en-us/library/ms162802(v=sql.120).aspx)

## Question: 51

You are designing a SQL Server database for an order fulfillment system.

You create a table named Sales.Orders by using the following script:

```
CREATE TABLE Sales.Orders
(
    OrderID int IDENTITY(1,1) NOT NULL PRIMARY KEY,
    OrderDate date NOT NULL,
    CustomerID int NOT NULL
);
```

Each order is tracked by using one of the following statuses:

Fulfilled

Shipped

Ordered

Received

You need to design the database to ensure that you can retrieve the status of an order on a given date. The solution must ensure that new statuses can be added in the future.

What should you do?

More than one answer choice may achieve the goal. Select the BEST answer.

- A. Implement change data capture on the Sales.Orders table.
- B. To the Sales.Orders table, add a column named Status that will store the order status. Update the Status column as the order status changes.
- C. Create a new table named Sales.OrderStatus that contains three columns named OrderID, StatusDate, and Status. Insert new rows into the table as the order status changes.
- D. To the Sales.Orders table, add three columns named FulfilledDate, ShippedDate, and ReceivedDate. Update the value of each column from null to the appropriate date as the order status changes.

---

**Answer: B**

---

### **Question: 52**

---

You deploy a database by using SQL Server 2014. The database contains a table named Table1.

You need to recommend a solution to track all of the deletions executed on Table1. The solution must minimize the amount of custom code required.

What should you recommend?

- A. Change data capture
- B. Statistics
- C. A trigger
- D. Master Data Services

---

**Answer: A**

---

Explanation:

Change data capture is designed to capture insert, update, and delete activity applied to SQL Server tables, and to make the details of the changes available in an easily consumed relational format. The change tables used by change data capture contain columns that mirror the column structure of a tracked source table, along with the metadata needed to understand the changes that have occurred.

Reference: [About Change Data Capture \(SQL Server\)](#)

### **Question: 53**

---

You have a SQL Server 2014 environment that includes four servers. The servers are configured as shown in the following table.

<b>Server name</b>	<b>SQL Server 2014 edition</b>	<b>SQL Server version</b>	<b>Details</b>
Server1	Enterprise	SQL Server 2014	A production Online Transaction Processing (OLTP) server
Server2	Web	SQL Server 2014	A test server
Server3	Standard	SQL Server 2012	A production report server
Server4	Express	SQL Server 2008 R2	A witness server

You plan to configure Policy-Based Management to enforce the following rules:

On Server1, enable SQL Server password policies and enable the default trace.

On Server3, ensure that the names of user-defined stored procedures begin with the prefix "usp\_" and ensure that all databases use a case-sensitive collation.

You need to recommend which server you must configure as a Central Management Server.

Which server should you recommend? (Each correct answer presents a complete solution. Choose all that apply.)

- A. Server1
- B. Server2
- C. Server3
- D. Seiver4

---

**Answer: A, C**

---

Explanation:

Need Standard or Enterprise edition of SQL Server.

---

### **Question: 54**

---

You are the administrator for a SQL Server 2014 instance that stores the data for an online transaction processing sales system.

The company takes full backups every week; differential backups on the days with no full backups; and hourly transaction backups. These backups are stored on a backup server in the company's data center.

Every week, the company places the full backup on a tape and sends it to a third-party backup storage system.

The company is worried that a disaster might occur that could destroy their computer center and cause them to lose orders.

You need to determine the best method for providing the smallest amount of data loss and downtime without leasing or purchasing additional physical locations.

What should you do? More than one answer choice may achieve the goal. Select the BEST answer.

- A. Set up SQL Server Always On with a SQL Azure database as a replica.
- B. Set up SQL Server Always On by using a SQL Server on a Windows Azure Virtual Machine.
- C. Put the differential backup on tape and send it to the third-party backup storage system.
- D. Use the Microsoft SQL Server Backup to Microsoft Windows Azure Tool to direct all backups to a different geographical location.

---

**Answer: D**

---

Explanation:

SQL Server 2012 was the first version to provide the ability to back up databases to the Cloud, and SQL Server 2014 improves on the process.

Microsoft SQL Server Backup to Windows Azure Tool enables backup to Windows Azure Blob Storage and encrypts and compresses SQL Server backups stored locally or in the cloud.

Reference:

[Smart, Secure, Cost-Effective: SQL Server Back Up to Windows Azure - SQL Server Team Blog - Site Home - TechNet Blogs](#)

---

### **Question: 55**

---

You have a SQL Server 2014 environment that contains 20 servers.

The corporate security policy states that all SQL Server 2014 instances must meet specific security standards.

You need to recommend a management strategy for the SQL Server 2014 servers.

What should you include in the recommendation?

More than one answer choice may achieve the goal. Select the BEST answer.

- A. Multi server jobs
- B. Policy-Based Management

- C. Common criteria compliance
- D. Maintenance plans

---

**Answer: B**

Explanation:

Policy-Based Management is a system for managing one or more instances of SQL Server. When SQL Server policy administrators use Policy-Based Management, they use SQL Server Management Studio to create policies to manage entities on the server, such as the instance of SQL Server, databases, or other SQL Server objects.

Reference:

[Policy-Based Management How-to Topics](#)

---

### **Question: 56**

You have a customer who has several SQL Server 2012 database servers.

You are designing a data warehouse for the customer. The data warehouse will use columnstore indexes.

The customer identifies that the following must be supported for the column store indexes.

Data manipulation language (DML) statements

Nonclustered columnstore indexes

Clustered columnstore indexes

Partitioning

You need to identify which technology requires the customer to implement an SQL Server 2014 database.

What should you identify?

- A. clustered columnstore indexes

- B. nonclustered columnstore indexes

- C. data manipulation language (DML) statements

- D. partitioning

---

**Answer: A**

Explanation:

SQL Server 2014 has the features of SQL Server 2012 plus updateable clustered columnstore indexes. This feature is required here as DML statements must be supported in the warehouse.

Reference: Columnstore Indexes Described

[https://msdn.microsoft.com/en-us/library/gg492088\(v=sql.120\).aspx](https://msdn.microsoft.com/en-us/library/gg492088(v=sql.120).aspx)

---

### **Question: 57**

You have a server named Server1 that has 2 processors.

You plan to deploy multiple instances of SQL Server 2014 to Server1. Each instance will have multiple databases.

You need to recommend a method to set limits on processor time for each database.

What should you include in the recommendation?

More than one answer choice may achieve the goal. Select the BEST answer.

- A. processor affinity

- B. Max Degree of Parallelism

- C. Windows System Resource Manager (WSRM)

- D. Resource Governor

---

**Answer: D**

---

**Explanation:**

SQL Server Resource Governor is a feature than you can use to manage SQL Server workload and system resource consumption. Resource Governor enables you to specify limits on the amount of CPU, physical IO, and memory that incoming application requests can use.

**Incorrect answers:**

Not A: Processor affinity cannot be used to assign databases to processors.

Not B: The Microsoft SQL Server max degree of parallelism (MAXDOP) configuration option controls the number of processors that are used for the execution of a query in a parallel plan. It is not used limit the processor time for a database.

Not C: You can use Windows System Resource Manager to allocate processor and memory resources to applications, users, Remote Desktop Services sessions, and Internet Information Services (IIS) application pools. You cannot use Windows System Resource Manager to allocate resources for a database.

**Reference:** Resource Governor

[https://msdn.microsoft.com/en-us/library/bb933866\(v=sql.120\).aspx](https://msdn.microsoft.com/en-us/library/bb933866(v=sql.120).aspx)

---

**Question: 58**

DRAG DROP

You define a table by using the following statement.

```
CREATE TABLE School.dbo.Teachers
(
    ID INT PRIMARY KEY,
    Teacher XML
)
```

The Teachers table contains one million records. A sample record of the XML data output is as follows:

```
<teacher>
  <id>12345</id>
  <name>Elementary Teacher1</name>
  <grade>5</grade>
  <subjects>
    <subject>English</subject>
    <subject>Math</subject>
  </subjects>
</teacher>
```

You plan to create queries against the table based on grade.

You need to recommend which indexes should be applied to the XML fields. The solution must meet the following requirements:

Reduce the amount of time required to query the table based on grade.

Minimize the size of the index.

What should you recommend? To answer, drag the appropriate index types to the correct fields. Each index type may be used once, more than once, or not at all. You may need to drag the split bar between panes or scroll to view

content.

#### Index Types

- No index
- Primary XML index
- Secondary XML index
- Selective XML index

#### Answer Area

- Grade:
- Id:
- Subject:

---

**Answer:**

#### Answer Area

- Grade: Secondary XML index
- Id: Primary XML index
- Subject: No index

Explanation:

XML indexes fall into the following categories:

- \* Primary XML index
- \* Secondary XML index

The first index on the xml type column must be the primary XML index.

Reference: XML Indexes (SQL Server)

<https://msdn.microsoft.com/en-us/library/ms191497.aspx>

---

#### Question: 59

You are using dynamic management views to monitor an SQL Server server named SQL1.

A database administrator named Dba1 must monitor the health of SQL1.

You need to ensure that Dba1 can access dynamic management views for SQL1. The solution must use the principle of least privilege.

Which permissions should you assign to Dba1?

- A. VIEW ANY DEFINITION
- B. VIEW SERVER STATE
- C. VIEW DEFINITION
- D. CONTROL SERVER

---

**Answer: B**

Explanation:

To query a dynamic management view or function requires SELECT permission on object and VIEW SERVER STATE or VIEW DATABASE STATE permission.

Reference: Dynamic Management Views and Functions (Transact-SQL)

<https://msdn.microsoft.com/en-us/library/ms188754.aspx>

## Question: 60

DRAG DROP

You have a database named DB1. DB1 contains a table named Sales.SalesPerson that has an index named AK\_SalesPerson\_rowguid. Queries that do not use the index take approximately 10 times longer to complete than queries that use the index.

You discover that AK\_SalesPerson\_rowguid has severe fragmentation.

You need to recommend a solution to defragment the index. The solution must ensure that the index can be used by queries during the defragmentation.

What statement should you use? To answer, drag the appropriate elements to the correct locations. Each element may be used once, more than once, or not at all. You may need to drag the split bar between panes or scroll to view content.

Elements	Answer Area
1	USE DB1 GO ALTER INDEX AK_SalesPerson_rowguid ON Sales.SalesPerson
BLOCKERS	Element WITH ( Element = Element )
FILLCOMPACT	Element WITH ( Element = Element )
OFF	Element WITH ( Element = Element )
ON	Element WITH ( Element = Element )
ONLINE	Element WITH ( Element = Element )
REBUILD	Element WITH ( Element = Element )
REORGANIZE	Element WITH ( Element = Element )

Answer:

### Answer Area

```
USE DB1
GO
ALTER INDEX AK_SalesPerson_rowguid ON Sales.SalesPerson

REBUILD WITH ( ONLINE = ON )
```

Explanation:

Rebuilding an index can be executed online or offline. Reorganizing an index is always executed online. To achieve availability similar to the reorganize option, you should rebuild indexes online.

Use: ALTER INDEX REBUILD WITH (ONLINE = ON)

Reference: Reorganize and Rebuild Indexes

<https://msdn.microsoft.com/en-us/library/ms189858.aspx>

## Question: 61

You have an SQL Server 2014 server named SQL1.

You are designing a performance monitoring solution.

You need to monitor the following events on SQL1:

A deadlock graph

Missing column statistics

CPU performance statistics

A batch of completed Transact-SQL statements

Which two tools should you use? Each correct answer presents a complete solution.

- A. dynamic management views
- B. Database Engine Tuning Advisor
- C. SQL Server Profiler
- D. Activity Monitor
- E. Data Profile Viewer

---

**Answer: BC**

---

Explanation:

B: Database Engine Tuning Advisor examines how queries are processed in the databases you specify.

When you run a Profiler Trace and feed it to the Database Engine Tuning Advisor, it also looks for missing column statistics, and it can automatically create them for you.

C: Use SQL Server Profiler to identify the cause of a deadlock. A deadlock occurs when there is a cyclic dependency between two or more threads, or processes, for some set of resources within SQL Server. Using SQL Server Profiler, you can create a trace that records, replays, and displays deadlock events for analysis.

Reference: Analyze Deadlocks with SQL Server Profiler

<https://msdn.microsoft.com/en-us/library/ms188246.aspx>

Reference: Mastering SQL Server Profiler, page 245

---

## Question: 62

---

DRAG DROP

You have an SQL Server 2014 server.

You plan to create four stored procedures that will use transactions. The stored procedures will be configured as shown in the following table.

<b>Stored procedure name</b>	<b>Concurrency strategy</b>
SP1	A transaction will only recognize data changes made before the start of the transaction. Other transactions are allowed to modify data.
SP2	A transaction can read data made from another transaction that has not been committed.
SP3	A transaction can only read data made from another transaction that has been committed.
SP4	During a transaction, no other transactions can modify data.

You need to recommend an isolation level for each stored procedure. The solution must support the concurrency strategy of each stored procedure and must minimize locks.

What should you recommend? To answer, drag the appropriate isolation levels to the correct stored procedures. Each isolation level may be used once, more than once, or not at all. You may need to drag the split bar between panes or scroll to view content.

**Isolation Levels**

READ COMMITTED

READ UNCOMMITTED

REPEATABLE READ

SERIALIZABLE

SNAPSHOT

•  
•  
•  
•

**Answer Area**

SP1: Isolation level

SP2: Isolation level

SP3: Isolation level

SP4: Isolation level

**Answer:****Answer Area**

SP1: SNAPSHOT

SP2: REPEATABLE READ

SP3: READ COMMITTED

SP4: SERIALIZABLE

**Explanation:**

\* SP1: SNAPSHOT

The transaction can only recognize data modifications that were committed before the start of the transaction. Data modifications made by other transactions after the start of the current transaction are not visible to statements executing in the current transaction. The effect is as if the statements in a transaction get a snapshot of the committed data as it existed at the start of the transaction.

\* SP2: REPEATABLE READ

Specifies that statements cannot read data that has been modified but not yet committed by other transactions and that no other transactions can modify data that has been read by the current transaction until the current transaction completes.

\* SP3: READ COMMITTED

Specifies that statements cannot read data that has been modified but not committed by other transactions. This prevents dirty reads.

\* SP4: SERIALIZABLE

SERIALIZABLE specification include:

/ No other transactions can modify data that has been read by the current transaction until the current transaction completes.

Reference: SET TRANSACTION ISOLATION LEVEL (Transact-SQL)

<https://msdn.microsoft.com/en-us/library/ms173763.aspx>

**Question: 63**

DRAG DROP

You need to assign security to dev\_role1.

How should you complete the code? To answer, drag the appropriate elements to the correct locations. Each element may be used once, more than once, or not at all. You may need to drag the split bar between panes or scroll to view content.

Elements	Answer Area
AUTHORIZATION	
CONTROL	ON [ ] ::[ ] TO [ ]
dev_role1	●
dev_schema1	●
OBJECT_ID	●
SCHEMA	●
SELECT	

---

**Answer:**

---

**Answer Area**

CONTROL	ON	SCHEMA	::[	dev_schema1	] TO [	dev_role1
---------	----	--------	-----	-------------	--------	-----------

---

**Explanation:**

\* Scenario: Application developers must be denied direct access to the database tables. Applications must be denied direct access to the tables.

### Question: 64

---

You need to recommend a solution to allow application users to perform UPDATE operations on the database tables. The solution must meet the business requirements.

What should you recommend?

- A. Create a user-defined database role and add users to the role.
- B. Create stored procedures that use EXECUTE AS clauses.
- C. Create a Policy-Based Management Policy.
- D. Create functions that use EXECUTE AS clauses.

---

**Answer: B**

---