70-764 Q&As

Administering a SQL Database Infrastructure

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QUESTION 1

You are a database administrator for an organization. You manage a mission-critical database named DB1 that is hosted on a server named LON-SQL1.

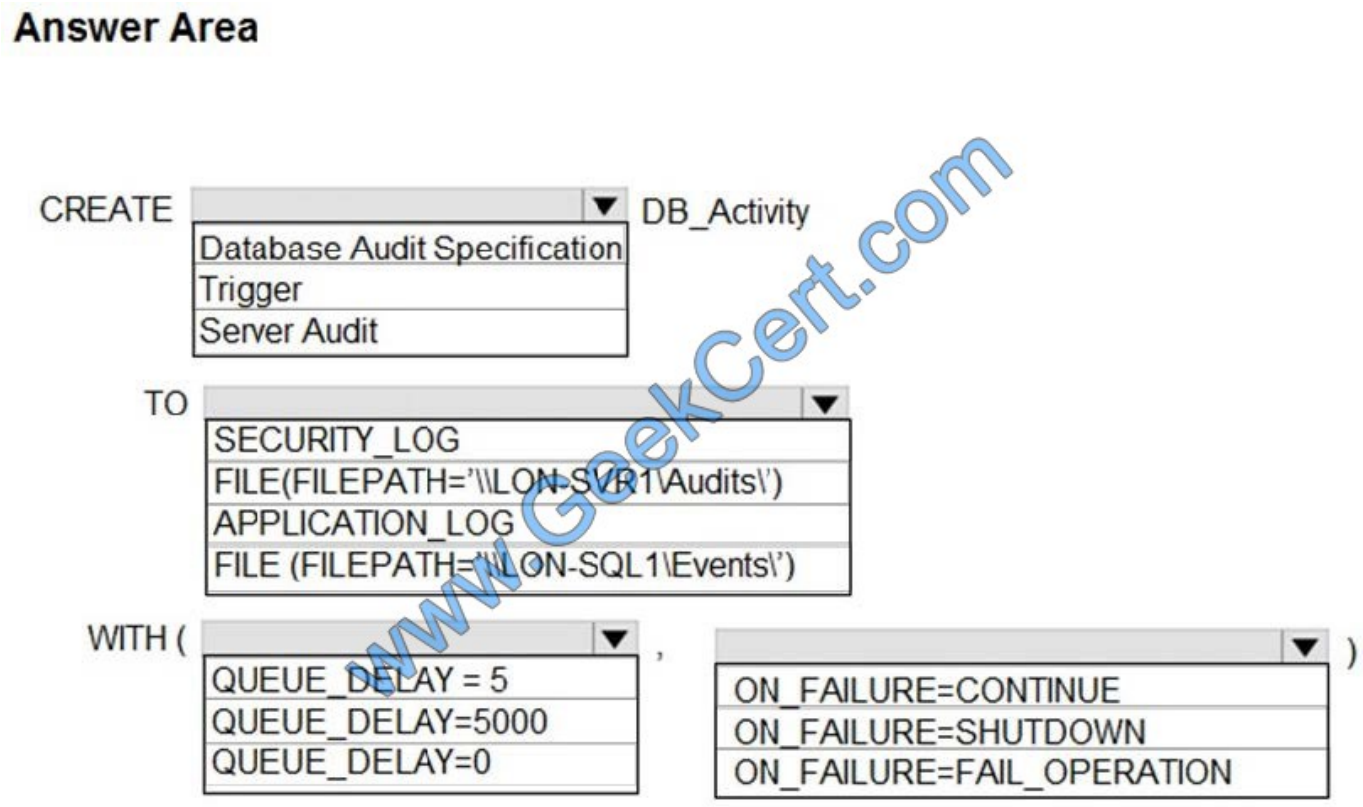
An audit record for transactions that occur in DB1 are written to a file every five seconds. If an audit record cannot be recorded, the transaction must be terminated. You create a shared folder named Audits on a server named LON-SVR1.

You need to implement the process for recording audit records.

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

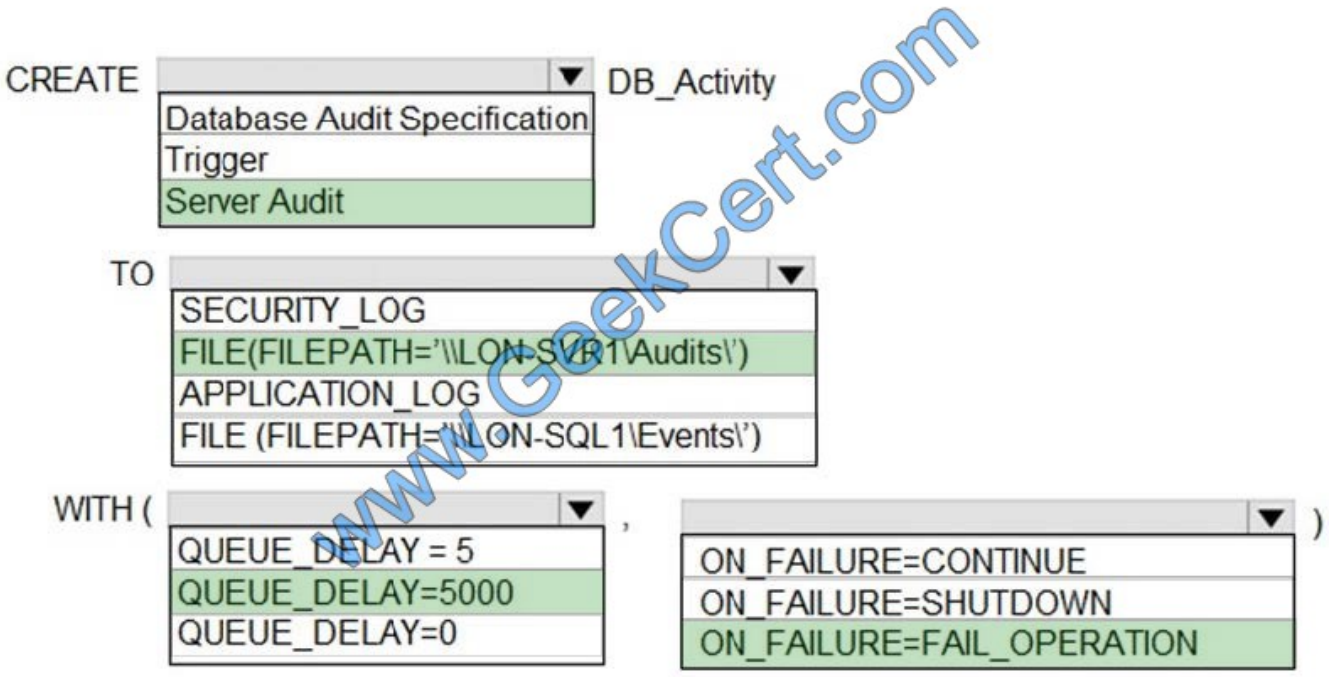
NOTE: Each correct selection is worth one point.

Hot Area:



Correct Answer:

Answer Area



Box 1: Server Audit The CREATE SERVER AUDIT command creates a server audit object using SQL Server Audit. Box 2: FILE(FILEPATH=\\'\\LON-SVR1\Audits\\\') An audit record for transactions that occur in DB1 are written to a file every five seconds. You create a shared folder named Audits on a server named LON-SVR1. Box 3: QUEUE_DELAY=5000 QUEUE_DELAY =integer Determines the time, in milliseconds, that can elapse before audit actions are forced to be processed. A value of 0 indicates synchronous delivery. The minimum settable query delay value is 1000 (1 second), which is the default. Box 4: ON_FAILURE= FAIL_OPERATION FAIL_OPERATION Database actions fail if they cause audited events. Actions, which do not cause audited events can continue, but no audited events can occur. The audit continues to attempt to log events and resumes if the failure condition is resolved. Use this option when maintaining a complete audit is more important than full access to the Database Engine.

References: https://docs.microsoft.com/en-us/sql/t-sql/statements/create-server-audit-transact-sql

QUESTION 2

Your company has offices in Seattle and Montreal.

The network contains two servers named Server1 and Server2 that have SQL Server 2012 installed. Server1 is located in the Seattle office. Server2 is located in the Montreal office. The latency of the WAN link between the Montreal office

and the Seattle office is more than 200 ms.

You plan to implement an AlwaysOn availability group on both servers.

You need to recommend a failover type for the availability group. What should you recommend?

A. Synchronous manual failover

B. Synchronous automatic failover

C. Asynchronous automatic failover

D. Asynchronous manual failover

Correct Answer: D

QUESTION 3

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_CP1_CI_AS collation.

A column named ProductName was created by using the varchar data type. The database contains a table named Orders.

Orders contains 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.

The previous version of the ERP application relied on table-level security.

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	uniquedentifier
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.Prod and Sales.Proc2 execute.

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.

Correct Answer: D

-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.

QUESTION 4

Which task should you perform before you can create a utility control point by using the service account option?

A. Disable the Microsoft SQL Server browser service

B. Start all Data Collector Sets (DCSs) in a Microsoft SQL Server instance

C. Enable named pipes on a Microsoft SQL Server instance

D. Configure the Microsoft SQL Server Agent service account to use an Active Directory Domain Services (AD DS) user account

Correct Answer: D

Utility Collection Set Account

Specify a Windows domain account to run the SQL Server Utility collection set. This account is used as the SQL Server Agent proxy account for the SQL Server Utility collection set. Alternatively, you can use the existing SQL Server Agent

service account. To pass validation requirements, use the following guidelines to specify the account.

If you specify the SQL Server Agent service account option:

The SQL Server Agent service account must be a Windows domain account that is not a built-in account like LocalSystem, NetworkService, or LocalService.

References:

https://docs.microsoft.com/en-us/sql/relational-databases/manage/create-a-sql-server-utility-control-point-sql-server-utility

QUESTION 5

Note: This question is part of a series of questions that present the same scenario. Each question in the series contains a unique solution that might meet the stated goals. Some question sets might have more than one correct solution, while

others might not have a correct solution.

After you answer a question in this section, you will NOT be able to return to it. As a result, these questions will not appear in the review screen.

You support an application that stores data in a Microsoft SQL Server database. You have a query that returns data for a report that users run frequently.

The query optimizer sometimes generates a poorly-performing plan for the query when certain parameters are used. You observe that this is due to the distribution of data within a specific table that the query uses.

You need to ensure that the query optimizer always uses the query plan that you prefer.

Solution: You force the desired plan.

Does the solution meet the goal?

A. Yes

B. No

Correct Answer: B

KEEPFIXED PLAN should be used as it forces the query optimizer not to recompile a query due to changes in statistics.

When FORCEPLAN is set to ON, the SQL Server query optimizer processes a join in the same order as the tables appear in the FROM clause of a query. In addition, setting FORCEPLAN to ON forces the use of a nested loop join unless other types of joins are required to construct a plan for the query, or they are requested with join hints or query hints. References: https://docs.microsoft.com/en-us/sql/t-sql/queries/hints-transact-sql-query?view=sql-server-2017

QUESTION 6

You administer a Microsoft SQL Server 2016 server.

When transaction logs grow, SQL Server must send an email message to the database administrators.

You need to configure SQL Server to send the email messages.

What should you configure?

A. SQL Mail

B. An Extended Events session

C. Alerts and operators in SQL Server Agent

D. Policies under Policy-Based Management

Correct Answer: C

Operators are aliases for people or groups that can receive electronic notification when jobs have completed or alerts have been raised. The SQL Server Agent service supports the notification of administrators through operators. Operators enable notification and monitoring capabilities of SQL Server Agent.

References: https://docs.microsoft.com/en-us/sql/relational-databases/database-mail/configure-sql-server-agent-mail-to-use-database-mail

QUESTION 7

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. A maintenance plan

B. SQL Server Agent jobs

C. Policy-Based Management

D. A Data Definition Language (DDL) trigger

Correct Answer: A

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.

QUESTION 8

Note: This question is part of a series of questions that use the same scenario. For your convenience, the scenario is repeated in each question. Each question presents a different goal and answer choices, but the text of the scenario is

exactly the same in each question in this series.

You are a database administrator for a company that has an on-premises Microsoft SQL Server environment and Microsoft Azure SQL Database instances. The environment hosts several customer databases, and each customer uses a

dedicated instance. The environments that you manage are shown in the following table.

Customer	Cloud Type	Description
AdventureWorks Cycles	Private	The environment includes a database named **Adventureworks** that contains a single schema named ADVSchema. You must implement auditing for all objects in the ADVSchema schema. You must also implement auditing to record access to data that is considered sensitive by the company.
Tailspin Toys	Private	Tailspin Toys has a custom application that accesses a hosted database named **TSpinDB**. The application will monitor **TSpinDB** and capture information over time about which database objects are accessed and how frequently they are accessed.
Contoso, Ltd.	Private	The environment has a database named **ConDB** that was recently upgraded to Microsoft SQL Server 2016. Contoso reports that **ConDB** is slow to return results when the server is busy. You must modify the startup parameters to **ConDB** to optimize performance.
Wingtip Toys	Private	Wingtip Toys has a database named **WingDB**. All tables in the database have indexes. Users report system response time is slow during peak activity periods. You observe that the performance issues are related to locking. Wingtip Toys receives data updates from suppliers each week. You must implement a process for importing the data into **WingDB**. You must use minimal logging and minimized data loss during import process.
Wide World Importers	Public	The environment includes a database named **WDWDB**. Neither auditing nor statistics are configured for **WDWDB**. You must log any deletion of views and all database record update operations.

You need to configure monitoring for Tailspin Toys.

In the table below, identify the monitoring tool that you must use for each activity.

NOTE: Make only one selection in each column.

Hot Area:

Answer Area

Correct Answer:

Answer Area

Monitoring from application: Transact-SQL

Transact-SQL can be used to monitor a customized application.

Trend analysis: System Monitor

System Monitor can provide trend analysis.

From question:

Tailspin Toys has a custom application that accesses a hosted database named TSpinDB.

The application will monitor TSpinDB and capture information over time about which database objects are accessed and how frequently they are accessed.

References: https://docs.microsoft.com/en-us/sql/relationaldatabases/performance/performance-monitoring-and-tuning-tools

QUESTION 9

You manage a Microsoft SQL Server that has a database named salesOrders. Users connect to the database by using a client application.

Users report that the application cannot connect to the database. You observe that the database storage has

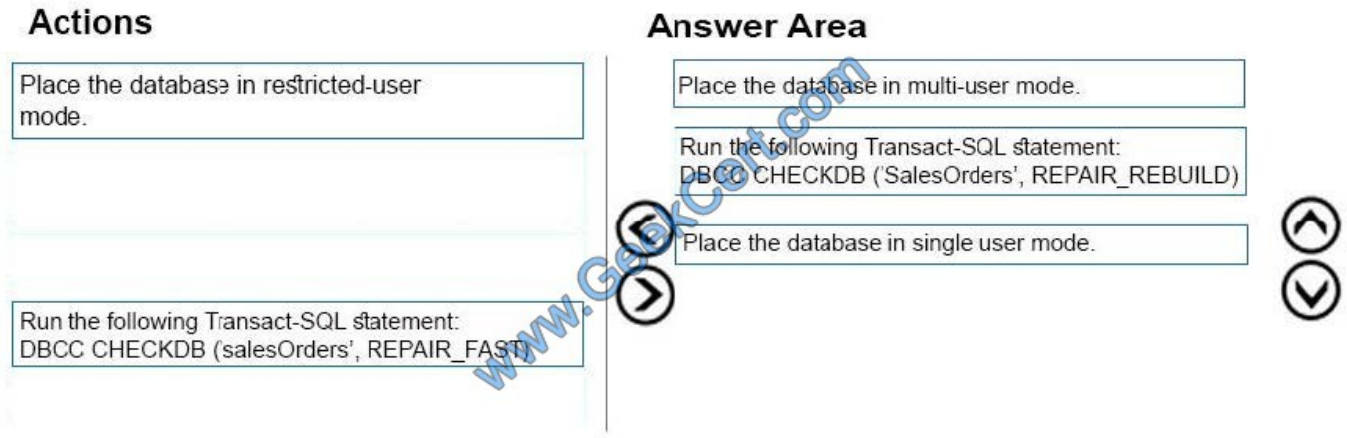
experienced a failure.

You need to repair the database and ensure that applications can connect to the database.

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

Select and Place:

Correct Answer:



The specified database must be in single-user mode to use one of the following repair options.

REPAIR_REBUILD

Performs repairs that have no possibility of data loss. This can include quick repairs, such as repairing missing rows in non-clustered indexes, and more time-consuming repairs, such as rebuilding an index.

QUESTION 10

Note: This question is part of a series of questions that use the same or similar answer choices. An answer choice may be correct for more than one question in the series. Each question is independent of the other questions in this series.

Information and details provided in a question apply only to that question.

A company has a Microsoft SQL Server environment in Microsoft Azure. The databases are stored directly in Azure blob storage.

You need to ensure that you can restore a database to a specific point in time between backups while minimizing the number of Azure storage containers required.

Which option should you use?

A. backup compression

B. backup encryption

C. file snapshot backup

D. mirrored backup media sets

E. SQL Server backup to URL

F. SQL Server Managed Backup to Azure

G. tail-log backup

H. back up and truncate the transaction log

Correct Answer: F

SQL Server Managed Backup to Microsoft Azure supports point in time restore for the retention time period specified.

References: https://docs.microsoft.com/en-us/sql/relational-databases/backup-restore/sql-server-managed-backup-to-microsoft-azure?view=sql-server-2017

QUESTION 11

You have a database named DB1. You complete a full backup on January1, 2018 to a backup set named DB1_Backup. You create a differential backup January 2, 2018 to the same backup set. You perform transaction log backups each day at 1:00 PM.

DB1 experiences a catastrophic failure.

You need to restore the database to January 3, 2018 at 11:00 AM.

Which three Transact-SQL segments should you use to develop the solution? To answer, move the appropriate Transact-SQL segment from the list of Transact-SQL segments to the answer area and arrange them in the correct order.

Select and Place:

Answer Area

Transact-SQL segments

```
RESTORE LOG DB1
FROM DB1_Backup
WITH FILE = 3, Recovery,
STOPAT = 'Jan 3, 2018 11:00 AM';
```

```
RESTORE LOG DB1
FROM DB1_Backup
WITH FILE = 3,
NONRECOVERY;
```

```
RESTORE DATABASE DB1
FROM DB1_Backup
WITH RECOVERY;
```

```
RESTORE DATABASE DB1
FROM DB1_Backup
WITH FILE = 1, NORECOVERY;
```

```
RESTORE DATABASE DB1
FROM DB1_Backup
WITH RECOVERY;
```

```
RESTORE DATABASE DB1
FROM DB1_Backup
WITH FILE = 2, NORECOVERY;
```

```
RESTORE LOG DB1
FROM DB1_Backup
WITH RECOVERY,
STOPAT = 'Jan 3, 2018 11:00 AM';
```


Correct Answer:

This example restores a database, differential database, and transaction log backup of the MyAdvWorks database.

Step 1:

-- Assume the database is lost at this point. Now restore the full

-- database. Specify the original full database backup and NORECOVERY.

-- NORECOVERY allows subsequent restore operations to proceed.

RESTORE DATABASE MyAdvWorks

FROM MyAdvWorks_1

WITH NORECOVERY;

GO

Step 2:

-- Now restore the differential database backup, the second backup on

-- the MyAdvWorks_1 backup device.

RESTORE DATABASE MyAdvWorks

FROM MyAdvWorks_1

WITH FILE = 2,

NORECOVERY;

Step 3:

-- Now restore each transaction log backup created after

-- the differential database backup.

RESTORE LOG MyAdvWorks

FROM MyAdvWorks_log1

WITH NORECOVERY; GO RESTORE LOG MyAdvWorks FROM MyAdvWorks_log2 WITH RECOVERY; GO

References: https://docs.microsoft.com/en-us/sql/relational-databases/backup-restore/restore-a-differential-database-backup-sql-server

QUESTION 12

Overview

General Overview

ADatum 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 5-ms latency. A. Datum standardizes its database platform by using SQL Server 2014 Enterprise

edition.

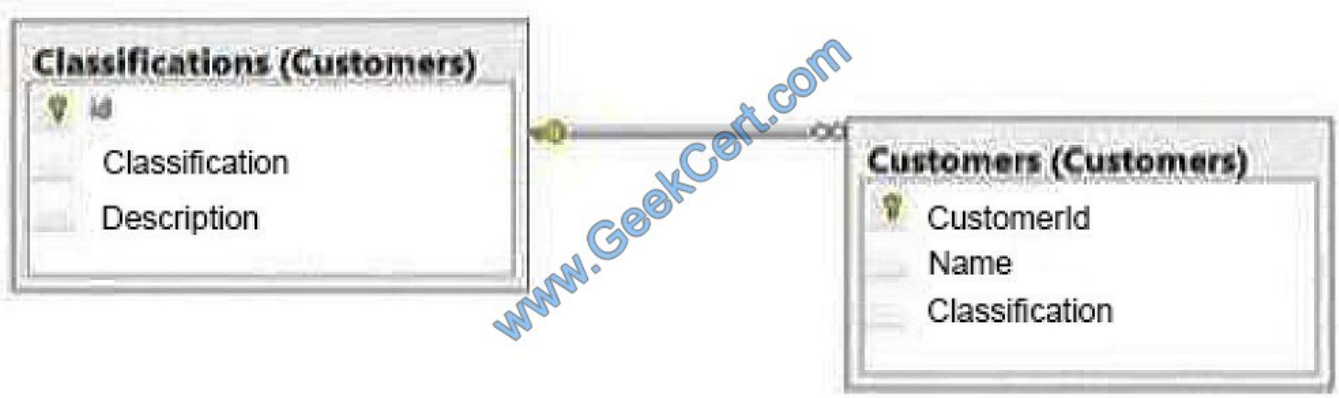
Databases

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:

ID	Classification	Description
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 updated frequently.

The database is often used for reporting.

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 Table1 sequentially several times. After the process is complete, Table1 is deleted. A stored procedure named USP_2 is used to generate a product list. The product list contains the names of products

grouped by category.

USP_2 takes several minutes to run due to locks on the tables the procedure accesses. The locks are caused by USP_1 and USP_3.

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 fails. 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.

All nested stored procedures handle errors by using structured exception handling. A stored procedure named USP_5 calls several stored procedures in the same database. Security checks are performed each time USP_5 calls a stored

procedure.

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 Time Objective (RTO) of 5 minutes.

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 manage security for 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

ADatum 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.

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.

Correct Answer: A

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.

QUESTION 13

You administer a Microsoft SQL Server 2016 database.

You have a SQL Server Agent job instance that runs using the service account.

You have a job step within the job that requires elevated privileges.

You need to ensure that the job step can run using a different user account.

What should you use?

A. a schedule

B. an alert

C. an operator

D. a proxy

Correct Answer: D

QUESTION 14

Note: This question is part of a series of questions that present the same scenario. Each question in the series contains a unique solution that might meet the stated goals. Some question sets might have more than one correct solution, while

others might not have a correct solution.

After you answer a question in this section, you will NOT be able to return to it. As a result, these questions will not appear in the review screen.

A company has an on-premises Microsoft SQL Server environment and Microsoft Azure SQL Database instances. The environment hosts several customer databases.

One customer reports that their database is not responding as quickly as the service level agreements dictate. You observe that the database is fragmented.

You need to optimize query performance.

Solution: You rebuild all indexes.

Does the solution meet the goal?

A. Yes

B. No

Correct Answer: A

You can remedy index fragmentation by either reorganizing an index or by rebuilding an index. References: https://msdn.microsoft.com/en-us/library/ms189858(v=sql.105).aspx

QUESTION 15

Note: This question is part of a series of questions that present the same scenario. Each question in the series contains a unique solution that might meet the stated goals. Some question sets might have more than one correct solution, while

others might not have a correct solution.

After you answer a question in this section, you will NOT be able to return to it. As a result, these questions will not appear in the review screen.

You have a database named DB1 that is 640 GB and is updated frequently.

You enable log shipping for DB1 and configure backup and restore to occur every 30 minutes.

You discover that the hard disks on the database server are almost full.

You need to reduce the amount of disk space used by the log shipping process.

Solution: You reduce the frequency of the transaction log backups to once per hour.

Does this meet the goal?

A. Yes

B. No

Correct Answer: B

You should compress the transaction log backups.

References: https://docs.microsoft.com/en-us/sql/database-engine/log-shipping/configure-log-shipping-sql-server?view=sql-server-2017