

## Topic 1

1.

**Question #1**

**HOTSPOT -**

You are implementing a software as a service (SaaS) ASP.NET Core web service that will run as an Azure Web App. The web service will use an on-premises SQL Server database for storage. The web service also includes a WebJob that processes data updates. Four customers will use the web service.

- ⇒ Each instance of the WebJob processes data for a single customer and must run as a singleton instance.
- ⇒ Each deployment must be tested by using deployment slots prior to serving production data.
- ⇒ Azure costs must be minimized.
- ⇒ Azure resources must be located in an isolated network.

You need to configure the App Service plan for the Web App.

How should you configure the App Service plan? To answer, select the appropriate settings in the answer area.

NOTE: Each correct selection is worth one point.

Hot Area:

**Answer Area**

App service plan setting	Value
Number of VM instances	<input type="button" value="▼"/> 2 4 8 16
Pricing tier	<input type="button" value="▼"/> Isolated Standard Premium Consumption

2.

**Question #2**

**Topic 1**

**DRAG DROP -**

You are a developer for a software as a service (SaaS) company that uses an Azure Function to process orders. The Azure Function currently runs on an Azure Function app that is triggered by an Azure Storage queue.

You are preparing to migrate the Azure Function to Kubernetes using Kubernetes-based Event Driven Autoscaling (KEDA).

You need to configure Kubernetes Custom Resource Definitions (CRD) for the Azure Function.

Which CRDs should you configure? To answer, drag the appropriate CRD types to the correct locations. Each CRD 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.

NOTE: Each correct selection is worth one point.

Select and Place:

**Answer Area**

CRD types	Setting	CRD type
Secret	Azure Function code	<input type="text"/>
Deployment	Polling interval	<input type="text"/>
ScaledObject	Azure Storage connection string	<input type="text"/>
TriggerAuthentication		

3.

**Question #3**

Topic 1

**HOTSPOT**

You are creating a CLI script that creates an Azure web app and related services in Azure App Service. The web app uses the following variables:

Variable name	Value
\$gitrepo	<a href="https://github.com/Contos/webapp">https://github.com/Contos/webapp</a>
\$webappname	Webapp1103

You need to automatically deploy code from GitHub to the newly created web app.

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

NOTE: Each correct selection is worth one point.

Hot Area:

**Answer Area**

```
az group create --location westeurope --name myResourceGroup  
    --name $webappname --resource-group myResourceGroup --sku FREE  
  
az webapp  
az appservice plan create  
az webapp deployment  
az group delete  
  
az webapp create  
az appservice plan create  
az webapp deployment  
az group delete  
  
-repo-url $gitrepo --branch master --manual-integration  
git clone $gitrepo  
-plan $webappname  
  
source config --name $webappname  
az webapp  
az appservice plan create  
az webapp deployment  
az group delete  
  
--resource-group myResourceGroup  
    --repo-url $gitrepo --branch master --manual-integration  
    git clone $gitrepo  
    -plan $webappname
```

4.

**Question #4**

Topic 1

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 develop a software as a service (SaaS) offering to manage photographs. Users upload photos to a web service which then stores the photos in Azure Storage Blob storage. The storage account type is General-purpose V2.

When photos are uploaded, they must be processed to produce and save a mobile-friendly version of the image. The process to produce a mobile-friendly version of the image must start in less than one minute.

You need to design the process that starts the photo processing.

Solution: Trigger the photo processing from Blob storage events.

Does the solution meet the goal?

- A. Yes
- B. No

5.

**Question #5****Topic 1**

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.

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You develop and deploy an Azure App Service API app to a Windows-hosted deployment slot named Development. You create additional deployment slots named Testing and Production. You enable auto swap on the Production deployment slot.

You need to ensure that scripts run and resources are available before a swap operation occurs.

Solution: Update the web.config file to include the applicationInitialization configuration element. Specify custom initialization actions to run the scripts.

Does the solution meet the goal?

- A. No
- B. Yes

**Question #6****Topic 1**

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.

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You develop and deploy an Azure App Service API app to a Windows-hosted deployment slot named Development. You create additional deployment slots named Testing and Production. You enable auto swap on the Production deployment slot.

You need to ensure that scripts run and resources are available before a swap operation occurs.

Solution: Enable auto swap for the Testing slot. Deploy the app to the Testing slot.

Does the solution meet the goal?

- A. No
- B. Yes

**Question #7****Topic 1**

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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 develop and deploy an Azure App Service API app to a Windows-hosted deployment slot named Development. You create additional deployment slots named Testing and Production. You enable auto swap on the Production deployment slot.

You need to ensure that scripts run and resources are available before a swap operation occurs.

Solution: Disable auto swap. Update the app with a method named statuscheck to run the scripts. Re-enable auto swap and deploy the app to the Production slot.

Does the solution meet the goal?

- A. No
- B. Yes

**Question #8****Topic 1**

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.

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You develop a software as a service (SaaS) offering to manage photographs. Users upload photos to a web service which then stores the photos in Azure Storage Blob storage. The storage account type is General-purpose V2.

When photos are uploaded, they must be processed to produce and save a mobile-friendly version of the image. The process to produce a mobile-friendly version of the image must start in less than one minute.

You need to design the process that starts the photo processing.

Solution: Convert the Azure Storage account to a BlockBlobStorage storage account.

Does the solution meet the goal?

- A. Yes
- B. No

### Question #9

HOTSPOT -

You are developing an Azure Web App. You configure TLS mutual authentication for the web app.

You need to validate the client certificate in the web app. To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.

Hot Area:

**Answer Area**

Property	Value
Client certificate location	<input type="checkbox"/> HTTP request header <input type="checkbox"/> Client cookie <input type="checkbox"/> HTTP message body <input type="checkbox"/> URL query string
Encoding type	<input type="checkbox"/> HTML <input type="checkbox"/> URL <input type="checkbox"/> Unicode <input type="checkbox"/> Base64

### Question #10

Topic

DRAG DROP -

You are developing a Docker/Go using Azure App Service Web App for Containers. You plan to run the container in an App Service on Linux. You identify a Docker container image to use.

None of your current resource groups reside in a location that supports Linux. You must minimize the number of resource groups required.

You need to create the application and perform an initial deployment.

Which three Azure CLI commands should you use to develop the solution? To answer, move the appropriate commands from the list of commands to the answer area and arrange them in the correct order.

Select and Place:

Azure CLI Commands	Answer Area
<input type="checkbox"/> az group create	
<input type="checkbox"/> az group update	
<input type="checkbox"/> az webapp update	
<input type="checkbox"/> az webapp create	
<input type="checkbox"/> az appservice plan create	

**Question #11**

Topic 1

**DRAG DROP -**

Fourth Coffee has an ASP.NET Core web app that runs in Docker. The app is mapped to the www.fourthcoffee.com domain.

Fourth Coffee is migrating this application to Azure.

You need to provision an App Service Web App to host this docker image and map the custom domain to the App Service web app.

A resource group named FourthCoffeePublicWebResourceGroup has been created in the WestUS region that contains an App Service Plan named

AppServiceLinuxDockerPlan.

Which order should the CLI commands be used to develop the solution? To answer, move all of the Azure CLI commands from the list of commands to the answer area and arrange them in the correct order.

Select and Place:

Azure CLI Commands	Answer Area
<pre>az webapp config container set --docker-custom-image-name \$dockerHubContainerPath --name \$appName --resource-group fourthCoffeePublicWebResourceGroup</pre>	
<pre>az webapp config hostname add --webapp-name \$appName --resource-group fourthCoffeePublicWebResourceGroup \ --hostname \$fqdn</pre>	
<pre>az webapp create --name \$appName --plan AppServiceLinuxDockerPlan --resource-group fourthCoffeePublicWebResourceGroup</pre>	
<pre>#!/bin/bash appName="FourthCoffeePublicWeb\$random" location="WestUS" dockerHubContainerPath="FourthCoffee/publicweb:v1" fqdn="http://www.fourthcoffee.com"&gt;www.fourthcoffee.com</pre>	

**Question #12**

Topic 1

**DRAG DROP -**

You are developing a serverless Java application on Azure. You create a new Azure Key Vault to work with secrets from a new Azure Functions application.

The application must meet the following requirements:

- ⇒ Reference the Azure Key Vault without requiring any changes to the Java code.
- ⇒ Dynamically add and remove instances of the Azure Functions host based on the number of incoming application events.
- ⇒ Ensure that instances are perpetually warm to avoid any cold starts.
- ⇒ Connect to a VNet.
- ⇒ Authentication to the Azure Key Vault instance must be removed if the Azure Function application is deleted.

You need to grant the Azure Functions application access to the Azure Key Vault.

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

Select and Place:

Actions	Answer Area
Create a user-assigned managed identity for the application.	
Create the Azure Functions app with a Premium plan type.	
Create an access policy in Azure Key Vault for the application identity.	
Create an SSL certification in Azure Key Vault for the application identity.	
Create the Azure Functions app with an App Service plan type.	
Create the Azure Functions app with a Consumption plan type.	
Create a system-assigned managed identity for the application.	

**Question #13**

Topic 1

You develop a website. You plan to host the website in Azure. You expect the website to experience high traffic volumes after it is published.

You must ensure that the website remains available and responsive while minimizing cost.

You need to deploy the website.

What should you do?

- A. Deploy the website to a virtual machine. Configure the virtual machine to automatically scale when the CPU load is high.
- B. Deploy the website to an App Service that uses the Shared service tier. Configure the App Service plan to automatically scale when the CPU load is high.
- C. Deploy the website to a virtual machine. Configure a Scale Set to increase the virtual machine instance count when the CPU load is high.
- D. Deploy the website to an App Service that uses the Standard service tier. Configure the App Service plan to automatically scale when the CPU load is high.

**Question #14**

Topic 1

**HOTSPOT -**

A company is developing a Java web app. The web app code is hosted in a GitHub repository located at <https://github.com/Contoso/webapp>.

The web app must be evaluated before it is moved to production. You must deploy the initial code release to a deployment slot named staging.

You need to create the web app and deploy the code.

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

NOTE: Each correct selection is worth one point.

Hot Area:

**Answer Area**

```
gitrepo=https://github.com/Contoso/webapp
webappname=businesswebapp
resourcegroupname=BusinessAppResourceGroup
az group create --location centralus --name $resourcegroupname
az webapp create --name $webappname --resource-group $resourcegroupname --sku S3
az webapp create --name $webappname --resource-group $resourcegroupname --plan $webappname
az webapp create --name $webappname --resource-group $resourcegroupname --slot staging
az webapp config --name $webappname --resource-group $resourcegroupname \
--slot staging --repo-url $gitrepo --branch master --manual-integration
```

Question #15

Topic 1

**HOTSPOT -**

You have a web service that is used to pay for food deliveries. The web service uses Azure Cosmos DB as the data store.

You plan to add a new feature that allows users to set a tip amount. The new feature requires that a property named tip on the document in Cosmos DB must be present and contain a numeric value.

There are many existing websites and mobile apps that use the web service that will not be updated to set the tip property for some time.

How should you complete the trigger?

NOTE: Each correct selection is worth one point.

Hot Area:

**Answer Area**

```
function ensureTip() {
    var r = __.value();
    r.readDocument("item");
    getContext().getHttpRequest();
    getContext().getResponse();

    var i = r.getBody();

    if (!("tip" in i)) {
        if (request.getValue("tip") == null) {
            if (isNaN(i["tip"]) || i["tip"] == null) {
                if (typeof __.pluck("tip") == 'number') {
                    i["tip"] = 0;
                }
            }
        }
    }

    r.setBody(i);
    r.setValue(i);
    __.upsertDocument(i);
    __.replaceDocument(i);
}
```

**Question #16**

**Topic 1**

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You develop an HTTP triggered Azure Function app to process Azure Storage blob data. The app is triggered using an output binding on the blob. The app continues to time out after four minutes. The app must process the blob data.

You need to ensure the app does not time out and processes the blob data.

**Solution:** Use the Durable Function async pattern to process the blob data.

Does the solution meet the goal?

A. Yes

B. No

**Question #17**

**Topic 1**

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You develop an HTTP triggered Azure Function app to process Azure Storage blob data. The app is triggered using an output binding on the blob. The app continues to time out after four minutes. The app must process the blob data.

You need to ensure the app does not time out and processes the blob data.

Solution: Pass the HTTP trigger payload into an Azure Service Bus queue to be processed by a queue trigger function and return an immediate HTTP success response.

Does the solution meet the goal?

A. Yes

B. No

**Question #18****Topic 1**

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You develop an HTTP triggered Azure Function app to process Azure Storage blob data. The app is triggered using an output binding on the blob.

The app continues to time out after four minutes. The app must process the blob data.

You need to ensure the app does not time out and processes the blob data.

Solution: Configure the app to use an App Service hosting plan and enable the Always On setting.

Does the solution meet the goal?

A. Yes

B. No

**Question #19****Topic 1**

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You develop a software as a service (SaaS) offering to manage photographs. Users upload photos to a web service which then stores the photos in Azure Storage Blob storage. The storage account type is General-purpose V2.

When photos are uploaded, they must be processed to produce and save a mobile-friendly version of the image. The process to produce a mobile-friendly version of the image must start in less than one minute.

You need to design the process that starts the photo processing.

Solution: Move photo processing to an Azure Function triggered from the blob upload.

Does the solution meet the goal?

A. Yes

B. No

**Question #20****Topic 1**

You are developing an application that uses Azure Blob storage.

The application must read the transaction logs of all the changes that occur to the blobs and the blob metadata in the storage account for auditing purposes. The changes must be in the order in which they occurred, include only create, update, delete, and copy operations and be retained for compliance reasons.

You need to process the transaction logs asynchronously.

What should you do?

A. Process all Azure Blob storage events by using Azure Event Grid with a subscriber Azure Function app.

B. Enable the change feed on the storage account and process all changes for available events.

C. Process all Azure Storage Analytics logs for successful blob events.

D. Use the Azure Monitor HTTP Data Collector API and scan the request body for successful blob events.

**Question #21****Topic 1**

DRAG DROP -

You plan to create a Docker image that runs an ASP.NET Core application named ContosoApp. You have a setup script named setupScript.ps1 and a series of application files including ContosoApp.dll.

You need to create a Dockerfile document that meets the following requirements:

⇒ Call setupScripts.ps1 when the container is built.

⇒ Run ContosoApp.dll when the container starts.

The Dockerfile document must be created in the same folder where ContosoApp.dll and setupScript.ps1 are stored.

Which five commands should you use to develop the solution? To answer, move the appropriate commands from the list of commands to the answer area and arrange them in the correct order.

Select and Place:

**Commands**

```
FROM microsoft/aspnetcore:latest
WORKDIR /apps/ContosoApp
CMD ["dotnet", "ContosoApp.dll"]
COPY ./ .
RUN powershell ./setupScript.ps1
```

**Answer Area**

**Question #22****Topic 1**

You are developing an Azure Function App that processes images that are uploaded to an Azure Blob container.

Images must be processed as quickly as possible after they are uploaded, and the solution must minimize latency. You create code to process images when the Function App is triggered.

You need to configure the Function App.

What should you do?

- A. Use an App Service plan. Configure the Function App to use an Azure Blob Storage input trigger.
- B. Use a Consumption plan. Configure the Function App to use an Azure Blob Storage trigger.
- C. Use a Consumption plan. Configure the Function App to use a Timer trigger.
- D. Use an App Service plan. Configure the Function App to use an Azure Blob Storage trigger.
- E. Use a Consumption plan. Configure the Function App to use an Azure Blob Storage input trigger.

**Question #23****Topic 1****HOTSPOT -**

You are configuring a new development environment for a Java application.

The environment requires a Virtual Machine Scale Set (VMSS), several storage accounts, and networking components.

The VMSS must not be created until the storage accounts have been successfully created and an associated load balancer and virtual network is configured.

How should you complete the Azure Resource Manager template? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.

Hot Area:

**Answer Area**

```
{
  ...
  "resources": [
    {
      "apiVersion": "2016-01-01",
      "type": "Microsoft.Storage/storageAccounts",
      "name": "[concat('",
      "copy",
      "copyIndex",
      "priority",
      "dependsOn"
      ")",
      "storage", uniqueString(resourceGroup().id))]",

      "location": "[resourceGroup().location]",
      ...
      "sku": {
        "name": "Standard_LRS"
      },
      "kind": "Storage",
      "properties": {},
      "copy": {
        "name": "storagesetup",
        "count": 3
      }
    },
    {
      "apiVersion": "2015-06-15",
      "type": "Microsoft.Compute/virtualMachines",
      "name": "[concat('VM', uniqueString(resourceGroup().id))]",
      "copy": [
        "copy",
        "copyIndex",
        "priority",
        "dependsOn"
        "[variables('loadBalancerName')]",
        "[variables('virtualNetworkName')]",
        "storagesetup",
      ],
      ...
    },
    {
      "outputs": {}
    }
  ]
}
```

**Question #24**

Topic 1

**HOTSPOT -**

You are developing an Azure Function App by using Visual Studio. The app will process orders input by an Azure Web App. The web app places the order information into Azure Queue Storage.

You need to review the Azure Function App code shown below.

```
public static class OrderProcessor
{
    [FunctionName("ProcessOrders")]
    public static void ProcessOrders([QueueTrigger("incoming-orders")]CloudQueueMessage myQueueItem, [Table("Orders")]ICollector<Order> tableBindings, TraceWriter log)
    {
        log.Info($"Processing Order: {myQueueItem.Id}");
        log.Info($"Queue Insertion Time: {myQueueItem.InsertionTime}");
        log.Info($"Queue Expiration Time: {myQueueItem.ExpirationTime}");
        tableBindings.Add(JsonConvert.DeserializeObject<Order>(myQueueItem.AsString));
    }
    [FunctionName("ProcessOrders-Poison")]
    public static void ProcessFailedOrders([QueueTrigger("incoming-orders-poison")]CloudQueueMessage myQueueItem, TraceWriter log)
    {
        log.Error($"Failed to process order: {myQueueItem.AsString}");
        ...
    }
}
```

NOTE: Each correct selection is worth one point.

Hot Area:

**Answer Area****Yes    No**

The code will log the time that the order was processed from the queue.

When the ProcessOrders function fails, the function will retry up to five times for a given order, including the first try.

When there are multiple orders in the queue, a batch of orders will be retrieved from the queue and the ProcessOrders function will run multiple instances concurrently to process the orders.

The ProcessOrders function will output the order to an Orders table in Azure Table Storage.

**Question #25**

Topic 1

**DRAG DROP -**

You are developing a solution for a hospital to support the following use cases:

- ⇒ The most recent patient status details must be retrieved even if multiple users in different locations have updated the patient record.
- ⇒ Patient health monitoring data retrieved must be the current version or the prior version.
- ⇒ After a patient is discharged and all charges have been assessed, the patient billing record contains the final charges.

You provision a Cosmos DB NoSQL database and set the default consistency level for the database account to Strong. You set the value for Indexing Mode to Consistent.

You need to minimize latency and any impact to the availability of the solution. You must override the default consistency level at the query level to meet the required consistency guarantees for the scenarios.

Which consistency levels should you implement? To answer, drag the appropriate consistency levels to the correct requirements. Each consistency 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.

NOTE: Each correct selection is worth one point.

Select and Place:

**Consistency levels**

Strong	Bounded Staleness
Consistent Prefix	Eventual

**Answer Area**

Return the most recent patient status.

 Consistency level

Return health monitoring data that is no less than one version behind.

 Consistency level

After patient is discharged and all charges are assessed, retrieve the correct billing data with the final charges.

 Consistency level

**Question #26**

Topic 1

**HOTSPOT -**

You are configuring a development environment for your team. You deploy the latest Visual Studio image from the Azure Marketplace to your Azure subscription. The development environment requires several software development kits (SDKs) and third-party components to support application development across the organization. You install and customize the deployed virtual machine (VM) for your development team. The customized VM must be saved to allow provisioning of a new team member development environment.

You need to save the customized VM for future provisioning.

Which tools or services should you use? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.

Hot Area:

**Answer Area****Action**

Generalize the VM.

**Tool or service**

- Azure PowerShell
- Visual Studio command prompt
- Azure Migrate
- Azure Backup

Store images.

- Azure Blob Storage
- Azure Data Lake Storage
- Azure File Storage
- Azure Table Storage

**Question #27**

Topic 1

You are preparing to deploy a website to an Azure Web App from a GitHub repository. The website includes static content generated by a script.

You plan to use the Azure Web App continuous deployment feature.

You need to run the static generation script before the website starts serving traffic.

What are two possible ways to achieve this goal? Each correct answer presents a complete solution.

NOTE: Each correct selection is worth one point.

- A. Add the path to the static content generation tool to WEBSITE\_RUN\_FROM\_PACKAGE setting in the host.json file.
- B. Add a PreBuild target in the websites csproj project file that runs the static content generation script.
- C. Create a file named run.cmd in the folder /run that calls a script which generates the static content and deploys the website.
- D. Create a file named .deployment in the root of the repository that calls a script which generates the static content and deploys the website.

**Reveal Solution****Discussion 38****Question #28**

Topic 1

**DRAG DROP -**

You are developing an application to use Azure Blob storage. You have configured Azure Blob storage to include change feeds.

A copy of your storage account must be created in another region. Data must be copied from the current storage account to the new storage account directly between the storage servers.

You need to create a copy of the storage account in another region and copy the data.

In which order should you perform the actions? To answer, move all actions from the list of actions to the answer area and arrange them in the correct order.

Select and Place:

Actions	Answer Area
Use AZCopy to copy the data to the new storage account.	
Deploy the template to create a new storage account in the target region.	 
Export a Resource Manager template.	
Create a new template deployment.	
Modify the template by changing the storage account name and region.	

**Question #29****Topic 1****DRAG DROP -**

You are preparing to deploy an Azure virtual machine (VM)-based application.

The VMs that run the application have the following requirements:

- ⇒ When a VM is provisioned the firewall must be automatically configured before it can access Azure resources.
- ⇒ Supporting services must be installed by using an Azure PowerShell script that is stored in Azure Storage.

You need to ensure that the requirements are met.

Which features should you use? To answer, drag the appropriate features to the correct requirements. Each feature 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.

NOTE: Each correct selection is worth one point.

Select and Place:

Features	Answer Area
Run Command	<b>Requirement</b> Firewall configuration
Serial console	<b>Feature</b>
Hybrid Runbook Worker	Supporting services script
Custom Script Extension	

**Reveal Solution****Discussion 20****Question #30****Topic 1****HOTSPOT -**

A company is developing a Node.js web app. The web app code is hosted in a GitHub repository located at <https://github.com/TailSpinToys/webapp>.

The web app must be reviewed before it is moved to production. You must deploy the initial code release to a deployment slot named review.

You need to create the web app and deploy the code.

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

NOTE: Each correct selection is worth one point.

Hot Area:

**Answer Area**

```
$gitrepo="https://github.com/TailSpinToys/webapp"
$webappname="TailSpinToysWeb"
$location="WestUS2"
-Name myResourceGroup -Location $location
New-AzWebAppSlot
New-AzWebApp
New-AzAppServicePlan
New-AzResourceGroup
-Name $webappname -Location $location -ResourceGroupName myResourceGroup -Tier Standard
New-AzWebAppSlot
New-AzWebApp
New-AzAppServicePlan
New-AzResourceGroup
-Name $webappname -Location $location -AppServicePlan $webappname -ResourceGroupName myResourceGroup
New-AzWebAppSlot
New-AzWebApp
New-AzAppServicePlan
New-AzResourceGroup
-Name $webappname -ResourceGroupName myResourceGroup -Slot review
New-AzWebAppSlot
New-AzWebApp
New-AzAppServicePlan
New-AzResourceGroup
$PropertiesObject = @{'repoUrl = "$gitrepo",branch = "master",'}
Set-AzResource -PropertyObject $PropertiesObject -ResourceGroupName myResourceGroup -ResourceType
Microsoft.Web/sites/slots/sourcecontrols -ResourceName $webappname/review/web -ApiVersion 2015-08-01 -Force
Switch-AzWebAppSlot -Name $webappname -ResourceGroupName myResourceGroup
-SourceSlotName review -DestinationSlotName production
```

**Question #31****Topic 1****HOTSPOT -**

You are developing an application that needs access to an Azure virtual machine (VM).

The access lifecycle for the application must be associated with the VM service instance.

You need to enable managed identity for the VM.

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

NOTE: Each correct selection is worth one point.

Hot Area:

**Answer Area**

```
$vm = Get-AzVM -ResourceGroupName "ContosoRG" -Name "ContosoVM"
```

```
Update-AzVM -ResourceGroupName "ContosoRG" -VM $vm
```

-AssignIdentity: -IdentityId:	▼
\$SystemAssigned \$UserAssigned	▼

**Question #32****Topic 1**

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 develop a software as a service (SaaS) offering to manage photographs. Users upload photos to a web service which then stores the photos in Azure Storage Blob storage. The storage account type is General-purpose V2.

When photos are uploaded, they must be processed to produce and save a mobile-friendly version of the image. The process to produce a mobile-friendly version of the image must start in less than one minute.

You need to design the process that starts the photo processing.

Solution: Create an Azure Function app that uses the Consumption hosting model and that is triggered from the blob upload.

Does the solution meet the goal?

A. Yes

B. No

**Question #33****Topic 1**

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 develop and deploy an Azure App Service API app to a Windows-hosted deployment slot named Development. You create additional deployment slots named Testing and Production. You enable auto swap on the Production deployment slot.

You need to ensure that scripts run and resources are available before a swap operation occurs.

Solution: Update the app with a method named statuscheck to run the scripts. Update the app settings for the app. Set the

WEBSITE\_SWAP\_WARMUP\_PING\_PATH and WEBSITE\_SWAP\_WARMUP\_PING\_STATUSES with a path to the new method and appropriate response codes.

Does the solution meet the goal?

A. No

B. Yes

**Question #34**

Topic 1

**HOTSPOT -**

You create the following PowerShell script:

```
$source = New-AzScheduledQueryRuleSource -Query 'Heartbeat | where TimeGenerated > ago(1h)' -DataSourceId "contoso"
$schedule = New-AzScheduledQueryRuleSchedule -FrequencyInMinutes 60 -TimeWindowInMinutes 60
$TriggerCondition = New-AzScheduledQueryRuleTriggerCondition -ThresholdOperator "LessThan" -Threshold 5
$aznsActionGroup = New-AzScheduledQueryRuleAznsActionGroup -ActionGroup "contoso" -EmailSubject "Custom email subject"
-CustomWebhookPayload "{ \"alert\":\"#alertrulename\", \"IncludeSearchResults\":true }"
$alertingAction = New-AzScheduledQueryRuleAlertingAction -AznsAction $aznsActionGroup -Severity "3" -Trigger $TriggerCondition
New-AzScheduledQueryRule -ResourceGroupName "contoso" -Location "eastus" -Action $alertingAction -Enabled $true
-Description "Alert description" -Schedule $schedule -Source $source -Name "Alert Name"
```

For each of the following statements, select Yes if the statement is true. Otherwise, select No.

NOTE: Each correct selection is worth one point.

Hot Area:

**Answer Area**

Statements	Yes	No
A log alert is created that sends an email when the CPU percentage is above 60 percent for five minutes.	<input type="radio"/>	<input type="radio"/>
A log alert is created that sends an email when the number of virtual machine heartbeats in the past hour is less than five.	<input type="radio"/>	<input type="radio"/>
The log alert is scheduled to run every two hours.	<input type="radio"/>	<input type="radio"/>

**Question #35**

Topic 1

**DRAG DROP -**

You are developing an Azure Function app.

The app must meet the following requirements:

- ⇒ Enable developers to write the functions by using the Rust language.
- ⇒ Declaratively connect to an Azure Blob Storage account.

You need to implement the app.

Which Azure Function app features should you use? To answer, drag the appropriate features to the correct requirements. Each feature 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.

NOTE: Each correct selection is worth one point.

Select and Place:

Features	Answer Area
Custom handler	
Extension bundle	
Trigger	
Runtime	
Policy	
Hosting plan	
Requirement	Feature
Enable developers to write the functions by using the Rust language.	<input type="text"/> Feature
Declaratively connect to an Azure Blob Storage account.	<input type="text"/> Feature

**Question #36****Topic 1****HOTSPOT -**

You are developing an ASP.NET Core web application. You plan to deploy the application to Azure Web App for Containers.

The application needs to store runtime diagnostic data that must be persisted across application restarts. You have the following code:

```
public void SaveDiagData(string data)
{
    var path = Environment.GetEnvironmentVariable("DIAGDATA");
    File.WriteAllText(Path.Combine(path, "data"), data);
}
```

You need to configure the application settings so that diagnostic data is stored as required.

How should you configure the web app's settings? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.

Hot Area:

**Answer Area**

App setting	Value
LOCALAPPDATA	true
WEBSITE_LOCALCACHE_ENABLED	
DOTNET_HOSTING_OPTIMIZATION_CACHE	
WEBSITES_ENABLE_APP_SERVICE_STORAGE	
DIAGDATA	/home /local D:/home D:/local

**Question #37****Topic 1**

You are developing a web app that is protected by Azure Web Application Firewall (WAF). All traffic to the web app is routed through an Azure Application Gateway instance that is used by multiple web apps. The web app address is contoso.azurewebsites.net.

All traffic must be secured with SSL. The Azure Application Gateway instance is used by multiple web apps.

You need to configure the Azure Application Gateway for the web app.

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

NOTE: Each correct selection is worth one point.

- A. In the Azure Application Gateway's HTTP setting, enable the Use for App service setting.
- B. Convert the web app to run in an Azure App service environment (ASE).
- C. Add an authentication certificate for contoso.azurewebsites.net to the Azure Application Gateway.
- D. In the Azure Application Gateway's HTTP setting, set the value of the Override backend path option to contoso22.azurewebsites.net.

**Question #38****Topic 1**

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 develop a software as a service (SaaS) offering to manage photographs. Users upload photos to a web service which then stores the photos in Azure Storage Blob storage. The storage account type is General-purpose V2.

When photos are uploaded, they must be processed to produce and save a mobile-friendly version of the image. The process to produce a mobile-friendly version of the image must start in less than one minute.

You need to design the process that starts the photo processing.

Solution: Use the Azure Blob Storage change feed to trigger photo processing.

Does the solution meet the goal?

- A. Yes
- B. No

**Topic 2**

**HOTSPOT -**

A company develops a series of mobile games. All games use a single leaderboard service.

You have the following requirements:

- ⇒ Code must be scalable and allow for growth.
- ⇒ Each record must consist of a playerId, gameId, score, and time played.
- ⇒ When users reach a new high score, the system will save the new score using the SaveScore function below.
- ⇒ Each game is assigned an Id based on the series title.

You plan to store customer information in Azure Cosmos DB. The following data already exists in the database:

PartitionKey	RowKey	Email
Harp	Walter	wharp@contoso.com
Smith	Steve	ssmith@contoso.com
Smith	Jeff	jsmith@contoso.com

You develop the following code to save scores in the data store. (Line numbers are included for reference only.)

```
01 public void SaveScore(string gameId, string playerId, int score, long timePlayed)
02 {
03     CloudStorageAccount storageAccount = CloudStorageAccount.Parse(connectionString);
04     CloudTableClient tableClient = storageAccount.CreateCloudTableClient();
05     CloudTable table = tableClient.GetTableReference("scoreTable");
06     table.CreateIfNotExists();
07     var scoreRecord = new PlayerScore(gameId, playerId, score, timePlayed);
08     TableOperation insertOperation = TableOperation.Insert(scoreRecord);
09     table.Execute(insertOperation);
10 }
```

You develop the following code to query the database. (Line numbers are included for reference only.)

```
01 CloudTableClient tableClient = account.CreateCloudTableClient();
02 CloudTable table = tableClient.GetTableReference("people");
03 TableQuery<CustomerEntity> query = new TableQuery<CustomerEntity>();
04 .Where( TableQuery.CombineFilters(
05     TableQuery.GenerateFilterCondition("PartitionKey", QueryComparisons.Equal, "Smith"),
06     TableOperators.And,
07     TableQuery.GenerateFilterCondition("Email", QueryComparisons.Equal, "ssmith@contoso.com")
08 ));
```

For each of the following statements, select Yes if the statement is true. Otherwise, select No.

NOTE: Each correct selection is worth one point.

Hot Area:

**Answer Area**

Statements	Yes	No
SaveScore will work with Cosmos DB.	<input type="radio"/>	<input type="radio"/>
SaveScore will update and replace a record if one already exists with the same playerId and gameId.	<input type="radio"/>	<input type="radio"/>
Leader board data for the game will be automatically partitioned using gameId.	<input type="radio"/>	<input type="radio"/>
SaveScore will store the values for the gameId and playerId parameters in the database.	<input type="radio"/>	<input type="radio"/>

[Reveal Solution](#)[Discussion 26](#)

**Question #2****Topic 2****HOTSPOT -**

You are developing a solution that uses the Azure Storage Client library for .NET. You have the following code: (Line numbers are included for reference only.)

```
01 CloudBlockBlob src = null;
02 try
03 {
04     src = container.ListBlobs().OfType<CloudBlockBlob>().FirstOrDefault();
05     var id = await src.AcquireLeaseAsync(null);
06     var dst = container.GetBlockBlobReference(src.Name);
07     string cpid = await dst.StartCopyAsync(src);
08     await dst.FetchAttributeAsync();
09     return id;
10 }
11 catch (Exception e)
12 {
13     throw;
14 }
15 finally
16 {
17     if (src != null)
18         await src.FetchAttributesAsync();
19     if (src.Properties.LeaseState != LeaseState.Available)
20         await src.BreakLeaseAsync(new TimeSpan(0));
21 }
```

For each of the following statements, select Yes if the statement is true. Otherwise, select No.

NOTE: Each correct selection is worth one point.

Hot Area:

**Answer Area****Statement****Yes****No**

The code creates an infinite lease

The code at line 06 always creates a new blob

The finally block releases the lease

**Question #3****Topic 2**

You are building a website that uses Azure Blob storage for data storage. You configure Azure Blob storage lifecycle to move all blobs to the archive tier after 30 days.

Customers have requested a service-level agreement (SLA) for viewing data older than 30 days.

You need to document the minimum SLA for data recovery.

Which SLA should you use?

- A. at least two days
- B. between one and 15 hours
- C. at least one day
- D. between zero and 60 minutes

**Reveal Solution****Discussion** 18

#### Question #4

##### HOTSPOT -

You are developing a ticket reservation system for an airline.

The storage solution for the application must meet the following requirements:

- ⇒ Ensure at least 99.99% availability and provide low latency.
- ⇒ Accept reservations even when localized network outages or other unforeseen failures occur.
- ⇒ Process reservations in the exact sequence as reservations are submitted to minimize overbooking or selling the same seat to multiple travelers.
- ⇒ Allow simultaneous and out-of-order reservations with a maximum five-second tolerance window.

You provision a resource group named airlineResourceGroup in the Azure South-Central US region.

You need to provision a SQL API Cosmos DB account to support the app.

How should you complete the Azure CLI commands? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.

Hot Area:

#### Answer Area

```
resourceGroupName='airlineResourceGroup'  
name='docdb-airline-reservations'  
databaseName='docdb-tickets-database'  
collectionName='docdb-tickets-collection'  
consistencyLevel=   
Strong  
Eventual  
ConsistentPrefix  
BoundedStaleness  
  
az cosmosdb create \  
--name $name \  
  
--enable-virtual-network true \  
--enable-automatic-failover true \  
--kind 'GlobalDocumentDB' \  
--kind 'MongoDB' \  
  
--resource-group $resourceGroupName \  
--max-interval 5 \  
  
--locations 'southcentralus' \  
--locations 'eastus' \  
--locations 'southcentralus=0 eastus=1 westus=2' \  
--locations 'southcentralus=0' \  
--default-consistency-level = $consistencylevel
```

**HOTSPOT -**

You are preparing to deploy a Python website to an Azure Web App using a container. The solution will use multiple containers in the same container group. The Dockerfile that builds the container is as follows:

```
FROM python:3
ADD website.py
CMD [ "python", "./website.py"]
```

You build a container by using the following command. The Azure Container Registry instance named images is a private registry.

```
docker build -t images.azurecr.io/website:v1.0.0
```

The user name and password for the registry is admin.

The Web App must always run the same version of the website regardless of future builds.

You need to create an Azure Web App to run the website.

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

NOTE: Each correct selection is worth one point.

Hot Area:

**Answer Area**

```
az configure --defaults web=website
az configure --defaults group=website
az appservice plan create --name websitePlan
```

- sku SHARED
- tags container
- sku B1 --hyper-v
- sku B1 --is-linux

```
az webapp create --plan websitePlan
```

- deployment-source-url images.azurecr.io/website:v1.0.0
- deployment-source-url images.azurecr.io/website:latest
- deployment-container-image-name images.azurecr.io/website:v1.0.0
- deployment-container-image-name images.azurecr.io/website:latest

```
az webapp config
```

- set --python-version 2.7 --generic-configurations user=admin password=admin
- set --python-version 3.6 --generic-configurations user=admin password=admin
- container set --docker-registry-server-url https://images.azurecr.io -u admin -p admin
- container set --docker-registry-server-url https://images.azurecr.io/website -u admin -p admin

[Reveal Solution](#)[Discussion 16](#)

**HOTSPOT -**

You are developing a back-end Azure App Service that scales based on the number of messages contained in a Service Bus queue.

A rule already exists to scale up the App Service when the average queue length of unprocessed and valid queue messages is greater than 1000.

You need to add a new rule that will continuously scale down the App Service as long as the scale up condition is not met.

How should you configure the Scale rule? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.

Hot Area:

**Answer Area**

**Scale rule**

Metric source

- Storage queue
- Service Bus queue
- Current resource
- Storage queue (classic)

Resource type

Service Bus Namespaces

Resource

MessageQueue1103

\* Queues

itemqueue

Criteria

\* Metric name

- Message Count
- Active Message Count

1 minute time grain

\* Time grain statistic

- Total
- Maximum
- Average
- Count

\* Operator

**Reveal Solution**

**Discussion** 12

Scale rule

Metric source

- Storage queue
- Service Bus queue
- Current resource
- Storage queue (classic)

Resource type

Service Bus Namespaces

Resource

MessageQueue1103

\* Queues

itemqueue

Criteria

\* Metric name

- Message Count
- Active Message Count

1 minute time grain

\* Time grain statistic

- Total
- Maximum
- Average
- Count

\* Operator

- Greater than
- Greater than or equal to
- Less than
- Less than or equal to

\* Threshold

1000

Action

\* Operation

- Increase count by
- Increase count to
- Decrease count by
- Decrease count to

\* Instance count

1

\* Cool down (minutes)

5

 CEplus.com

**Question #7***Topic 2*

DRAG DROP -

You have an application that uses Azure Blob storage.

You need to update the metadata of the blobs.

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

Select and Place:

**Methods****Metadata.Add****SetMetadataAsync****FetchAttributesAsync****UploadFileStream****SetPropertiesAsync****Answer Area****Question #8***Topic 2*

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 are developing an Azure solution to collect point-of-sale (POS) device data from 2,000 stores located throughout the world. A single device can produce 2 megabytes (MB) of data every 24 hours. Each store location has one to five devices that send data.

You must store the device data in Azure Blob storage. Device data must be correlated based on a device identifier. Additional stores are expected to open in the future.

You need to implement a solution to receive the device data.

Solution: Provision an Azure Event Grid. Configure the machine identifier as the partition key and enable capture.

Does the solution meet the goal?

A. Yes

B. No

**Reveal Solution****Discussion 34****Question #9***Topic .*

You develop Azure solutions.

A .NET application needs to receive a message each time an Azure virtual machine finishes processing data. The messages must NOT persist after being processed by the receiving application.

You need to implement the .NET object that will receive the messages.

Which object should you use?

A. QueueClient

B. SubscriptionClient

C. TopicClient

D. CloudQueueClient

**Question #10**

Topic 2

**DRAG DROP -**

You are maintaining an existing application that uses an Azure Blob GPv1 Premium storage account. Data older than three months is rarely used.

Data newer than three months must be available immediately. Data older than a year must be saved but does not need to be available immediately.

You need to configure the account to support a lifecycle management rule that moves blob data to archive storage for data not modified in the last year.

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

Select and Place:

Actions	Answer Area
Upgrade the storage account to GPv2	
Create a new GPv2 Standard account and set its default access tier level to cool	 
Change the storage account access tier from hot to cool	
Copy the data to be archived to a Standard GPv2 storage account and then delete the data from the original storage account	

**Question #11**

**You develop Azure solutions.**

**You must connect to a No-SQL globally-distributed database by using the .NET API.**

**You need to create an object to configure and execute requests in the database.**

**Which code segment should you use?**

- A. `new Container(EndpointUri, PrimaryKey);`
- B. `new Database(EndpointUri, PrimaryKey);`
- C. `new CosmosClient(EndpointUri, PrimaryKey);`

**Question #12**

You have an existing Azure storage account that stores large volumes of data across multiple containers.

You need to copy all data from the existing storage account to a new storage account. The copy process must meet the following requirements:

⇒ Automate data movement.

⇒ Minimize user input required to perform the operation.

⇒ Ensure that the data movement process is recoverable.

What should you use?

- A. AzCopy
- B. Azure Storage Explorer
- C. Azure portal
- D. .NET Storage Client Library

**Question #13**

Topic 2

**DRAG DROP .**

You are developing a web service that will run on Azure virtual machines that use Azure Storage. You configure all virtual machines to use managed identities.

You have the following requirements:

- ⇒ Secret-based authentication mechanisms are not permitted for accessing an Azure Storage account.
- ⇒ Must use only Azure Instance Metadata Service endpoints.

You need to write code to retrieve an access token to access Azure Storage. To answer, drag the appropriate code segments to the correct locations. Each code segment may be used once or not at all. You may need to drag the split bar between panes or scroll to view content.

NOTE: Each correct selection is worth one point.

Select and Place:

**Code segment 1**

```
http://localhost:50342/oauth2/token
http://169.254.169.254:50432/oauth2/token
http://localhost/metadata/identity/oauth2/token
http://169.254.169.254/metadata/identity/oauth2/token
```

**Code segment 2**

```
XDocument.Parse(payload);
new MultipartContent(payload);
new NetworkCredential("Azure", payload);
JsonConvert.DeserializeObject<Dictionary<string, string>>(payload);
```

**Answer Area**

```
var url = " [REDACTED] " ;
var queryString = "...";
var client = new HttpClient();
var response = await client.GetAsync(url + queryString);
var payload = await response.Content.ReadAsStringAsync();
```

```
return [REDACTED] Code segment 2
```

**Question #14**

Topic 2

**DRAG DROP .**

You are developing a new page for a website that uses Azure Cosmos DB for data storage. The feature uses documents that have the following format:

```
{
    "name": "John",
    "city" : "Seattle"
}
```

You must display data for the new page in a specific order. You create the following query for the page:

```
SELECT*
FROM People p
ORDER BY p.name, p.city DESC
```

You need to configure a Cosmos DB policy to support the query.

How should you configure the policy? To answer, drag the appropriate JSON segments to the correct locations. Each JSON segment 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.

NOTE: Each correct selection is worth one point.

Select and Place:

**JSON segments****Answer Area**

```
orderBy
sortOrder
ascending
descending
compositeIndexes
```

```
{
    "automatic": true,
    "ngMode": "Consistent",
    "includedPaths": [
        {
            "path": "/*"
        }
    ],
    "excludedPaths": [],
    " [REDACTED] " : [
        [
            {
                "path": "/name", "order": "descending"
            },
            {
                "path": "/city", "order": " [REDACTED] "
            }
        ]
    ]
}
```

**Question #15**

Topic 2

**HOTSPOT -**

You are building a traffic monitoring system that monitors traffic along six highways. The system produces time series analysis-based reports for each highway. Data from traffic sensors are stored in Azure Event Hub.

Traffic data is consumed by four departments. Each department has an Azure Web App that displays the time series-based reports and contains a WebJob that processes the incoming data from Event Hub. All Web Apps run on App Service Plans with three instances.

Data throughput must be maximized. Latency must be minimized.

You need to implement the Azure Event Hub.

Which settings should you use? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.

Hot Area:

**Answer Area**

Setting	Value
Number of partitions	<input type="button" value="▼"/>
3	
4	
6	
12	
Partition Key	<input type="button" value="▼"/>
Highway	
Department	
Timestamp	
VM name	

**Question #16**

Topic 2

**DRAG DROP -**

You are developing a microservices solution. You plan to deploy the solution to a multinode Azure Kubernetes Service (AKS) cluster.

You need to deploy a solution that includes the following features:

- ⇒ reverse proxy capabilities
- ⇒ configurable traffic routing
- ⇒ TLS termination with a custom certificate

Which components should you use? To answer, drag the appropriate components to the correct requirements. Each component 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.

NOTE: Each correct selection is worth one point.

Select and Place:

**Answer Area**

Components	Action	Component
Helm		
Draft	Deploy solution.	<input type="button" value=""/>
Brigade		<input type="button" value=""/>
KubeCtl	View cluster and external IP addressing.	<input type="button" value=""/>
Ingress Controller	Implement a single, public IP endpoint that is routed to multiple microservices.	<input type="button" value=""/>
CoreDNS		
Virtual Kubelet		

**Question #17**

Topic 2

**DRAG DROP .**

You are implementing an order processing system. A point of sale application publishes orders to topics in an Azure Service Bus queue. The Label property for the topic includes the following data:

Property	Description
ShipLocation	the country/region where the order will be shipped
CorrelationId	a priority value for the order
Quantity	a user-defined field that stores the quantity of items in an order
AuditedAt	a user-defined field that records the date an order is audited

The system has the following requirements for subscriptions:

Subscription type	Comments
FutureOrders	This subscription is reserved for future use and must not receive any orders
HighPriorityOrders	Handle all high priority orders and international orders
InternationalOrders	Handle orders where the country/region is not United States
HighQuantityOrders	Handle only orders with quantities greater than 100 units
AllOrders	This subscription is used for auditing purposes. This subscription must receive every single order. AllOrders has an Action defined that updates the AuditedAt property to include the date and time it was received by the subscription.

You need to implement filtering and maximize throughput while evaluating filters.

Which filter types should you implement? To answer, drag the appropriate filter types to the correct subscriptions. Each filter 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.

NOTE: Each correct selection is worth one point.

Select and Place:

Filter types	Answer Area
SQLFilter	Subscription: FutureOrders Filter type: filter type
CorrelationFilter	Subscription: HighPriorityOrders Filter type: filter type
No Filter	Subscription: InternationalOrders Filter type: filter type
	Subscription: HighQuantityOrders Filter type: filter type
	Subscription: AllOrders Filter type: filter type

**Question #18**

Topic 2

**DRAG DROP .**

Your company has several websites that use a company logo image. You use Azure Content Delivery Network (CDN) to store the static image.

You need to determine the correct process of how the CDN and the Point of Presence (POP) server will distribute the image and list the items in the correct order.

In which order do the actions occur? To answer, move all actions from the list of actions to the answer area and arrange them in the correct order.

Select and Place:

Actions	Answer Area
If no edge servers in the POP have the image in cache, the POP requests the file from the origin server.	
A user requests the image from the CDN URL. The DNS routes the request to the best performing POP location.	>
Subsequent requests for the file may be directed to the same POP using the CDN logo image URL. The POP edge server returns the file from cache if the TTL has not expired.	<
The origin server returns the logo image to an edge server in the POP. An edge server in the POP caches the logo image and returns the image to the client.	^ v

#### Question #19

You are developing an Azure Cosmos DB solution by using the Azure Cosmos DB SQL API. The data includes millions of documents. Each document may contain hundreds of properties.

The properties of the documents do not contain distinct values for partitioning. Azure Cosmos DB must scale individual containers in the database to meet the performance needs of the application by spreading the workload evenly across all partitions over time.

You need to select a partition key.

Which two partition keys can you use? Each correct answer presents a complete solution.

NOTE: Each correct selection is worth one point.

- A. a single property value that does not appear frequently in the documents
- B. a value containing the collection name
- C. a single property value that appears frequently in the documents
- D. a concatenation of multiple property values with a random suffix appended
- E. a hash suffix appended to a property value

#### Question #20

Topic 2

##### HOTSPOT -

You are developing an Azure-hosted e-commerce web application. The application will use Azure Cosmos DB to store sales orders. You are using the latest SDK to manage the sales orders in the database.

You create a new Azure Cosmos DB instance. You include a valid endpoint and valid authorization key to an appSettings.json file in the code project.

You are evaluating the following application code: (Line number are included for reference only.)

```
01 using System;
02 using System.Threading.Tasks;
03 using Microsoft.Azure.Cosmos;
04 using Microsoft.Extensions.Configuration;
05 using Newtonsoft.Json;
06 namespace SalesOrders
07 {
08     public class SalesOrder
09     {
10         . . .
11     }
12     internal class ManageSalesOrders
13     {
14         private static async Task GenerateSalesOrders()
15         {
16             IConfigurationRoot configuration = new ConfigurationBuilder().AddJsonFile("appSettings.json").Build();
17             string endpoint = configuration["EndPointUrl"];
18             string authKey = configuration["AuthorizationKey"];
19             using CosmosClient client = new CosmosClient(endpoint, authKey);
20             Database database = null;
21             using (await client.GetDatabase("SalesOrders").DeleteStreamAsync()) { }
22             database = await client.CreateDatabaseIfNotExistsAsync("SalesOrders");
23             Container container1 = await database.CreateContainerAsync(id: "Container1", partitionKeyPath: "/AccountNumber");
24             Container container2 = await database.CreateContainerAsync(id: "Container2", partitionKeyPath: "/AccountNumber");
25             SalesOrder salesOrder1 = new SalesOrder() { AccountNumber = "123456" };
26             await container1.CreateItemAsync(salesOrder1, new PartitionKey(salesOrder1.AccountNumber));
27             SalesOrder salesOrder2 = new SalesOrder() { AccountNumber = "654321" };
28             await container1.CreateItemAsync(salesOrder2, new PartitionKey(salesOrder2.AccountNumber));
29             SalesOrder salesOrder3 = new SalesOrder() { AccountNumber = "109876" };
30             await container2.CreateItemAsync(salesOrder3, new PartitionKey(salesOrder3.AccountNumber));
31             _ = await database.CreateUserAsync("User1");
32             User user1 = database.GetUser("User1");
33             _ = await user1.ReadAsync();
34         }
35     }
36 }
```

For each of the following statements, select Yes if the statement is true. Otherwise, select No.

NOTE: Each correct selection is worth one point.

Hot Area:

#### Answer Area

Statements	Yes	No
A database named SalesOrders is created. The database will include two containers.	<input type="radio"/>	<input type="radio"/>
Container1 will contain two items.	<input type="radio"/>	<input type="radio"/>
Container2 will contain one item.	<input type="radio"/>	<input type="radio"/>

**Question #21****Topic 2****DRAG DROP -**

You develop an Azure solution that uses Cosmos DB.

The current Cosmos DB container must be replicated and must use a partition key that is optimized for queries.

You need to implement a change feed processor solution.

Which change feed processor components should you use? To answer, drag the appropriate components to the correct requirements. Each component 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 the content.

NOTE: Each correct selection is worth one point.

Select and Place:

Components	Answer Area	Requirement	Component
Host		Store the data from which the change feed is generated.	Component
Delegate		Coordinate processing of the change feed across multiple workers.	Component
Lease container		Use the change feed processor to listen for changes.	Component
Monitored container		Handle each batch of changes.	Component

## Topic 3

**Question #1****Topic 3****DRAG DROP -**

You develop a web application.

You need to register the application with an active Azure Active Directory (Azure AD) tenant.

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

Select and Place:

Actions	Answer Area
Select <b>Manifest</b> from the middle-tier service registration.	
In Enterprise Applications, select <b>New application</b> .	
Add a Cryptographic key.	
Create a new application and provide the name, account type, and redirect URI.	 
Select the Azure AD instance.	 
Use an access token to access the secure resource.	
In App Registrations, select <b>New registration</b> .	

#### Question #2

You have a new Azure subscription. You are developing an internal website for employees to view sensitive data. The website uses Azure Active Directory (Azure AD) for authentication.

You need to implement multifactor authentication for the website.

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

NOTE: Each correct selection is worth one point.

- A. Configure the website to use Azure AD B2C.
- B. In Azure AD, create a new conditional access policy.
- C. Upgrade to Azure AD Premium.
- D. In Azure AD, enable application proxy.
- E. In Azure AD conditional access, enable the baseline policy.

#### Question #3

Topic 3

You are developing a Java application that uses Cassandra to store key and value data. You plan to use a new Azure Cosmos DB resource and the Cassandra API in the application. You create an Azure Active Directory (Azure AD) group named Cosmos DB Creators to enable provisioning of Azure Cosmos accounts, databases, and containers.

The Azure AD group must not be able to access the keys that are required to access the data.

You need to restrict access to the Azure AD group.

Which role-based access control should you use?

- A. DocumentDB Accounts Contributor
- B. Cosmos Backup Operator
- C. Cosmos DB Operator
- D. Cosmos DB Account Reader

#### Question #4

Topic 4

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 are developing a website that will run as an Azure Web App. Users will authenticate by using their Azure Active Directory (Azure AD) credentials.

You plan to assign users one of the following permission levels for the website: admin, normal, and reader. A user's Azure AD group membership must be used to determine the permission level.

You need to configure authorization.

Solution: Configure the Azure Web App for the website to allow only authenticated requests and require Azure AD log on.

Does the solution meet the goal?

- A. Yes
- B. No

#### Question #5

Topic 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 are developing a website that will run as an Azure Web App. Users will authenticate by using their Azure Active Directory (Azure AD) credentials.

You plan to assign users one of the following permission levels for the website: admin, normal, and reader. A user's Azure AD group membership must be used to determine the permission level.

You need to configure authorization.

Solution:

⇒ Create a new Azure AD application. In the application's manifest, set value of the groupMembershipClaims option to All.

⇒ In the website, use the value of the groups claim from the JWT for the user to determine permissions.

Does the solution meet the goal?

- A. Yes
- B. No

**Question #6****Topic 3**

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 are developing a website that will run as an Azure Web App. Users will authenticate by using their Azure Active Directory (Azure AD) credentials.

You plan to assign users one of the following permission levels for the website: admin, normal, and reader. A user's Azure AD group membership must be used to determine the permission level.

You need to configure authorization.

Solution:

⇒ Create a new Azure AD application. In the application's manifest, define application roles that match the required permission levels for the application.

⇒ Assign the appropriate Azure AD group to each role. In the website, use the value of the roles claim from the JWT for the user to determine permissions.

Does the solution meet the goal?

A. Yes

B. No

**Question #7****Topic 3**

DRAG DROP -

You are developing an application to securely transfer data between on-premises file systems and Azure Blob storage. The application stores keys, secrets, and certificates in Azure Key Vault. The application uses the Azure Key Vault APIs.

The application must allow recovery of an accidental deletion of the key vault or key vault objects. Key vault objects must be retained for 90 days after deletion.

You need to protect the key vault and key vault objects.

Which Azure Key Vault feature should you use? To answer, drag the appropriate features to the correct actions. Each feature 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.

NOTE: Each correct selection is worth one point.

Select and Place:

Features	Answer Area	Action	Feature
Access policy		Enable retention period and accidental deletion.	Feature
Purge protection			Feature
Soft delete		Enforce retention period and accidental deletion.	Feature
Shared access signature			

**Question #8**

You provide an Azure API Management managed web service to clients. The back-end web service implements HTTP Strict Transport Security (HSTS).

Every request to the backend service must include a valid HTTP authorization header.

You need to configure the Azure API Management instance with an authentication policy.

Which two policies can you use? Each correct answer presents a complete solution.

NOTE: Each correct selection is worth one point.

- A. Basic Authentication
- B. Digest Authentication
- C. Certificate Authentication
- D. OAuth Client Credential Grant

**Question #9**

Topic

**DRAG DROP -**

You are developing an ASP.NET Core website that can be used to manage photographs which are stored in Azure Blob Storage containers.

Users of the website authenticate by using their Azure Active Directory (Azure AD) credentials.

You implement role-based access control (RBAC) role permissions on the containers that store photographs. You assign users to RBAC roles.

You need to configure the website's Azure AD Application so that user's permissions can be used with the Azure Blob containers.

How should you configure the application? To answer, drag the appropriate setting to the correct location. Each setting can 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.

**NOTE:** Each correct selection is worth one point.

Select and Place:

Settings	Answer Area		
client_id			
profile			
delegated			
application			
user_impersonation			
	API	Permission	Type
	Azure Storage	Setting	Setting
	Microsoft Graph	User.Read	Setting

**Question #10**

Topic 3

**HOTSPOT -**

You are developing an ASP.NET Core app that includes feature flags which are managed by Azure App Configuration. You create an Azure App Configuration store named AppFeatureFlagStore that contains a feature flag named Export.

You need to update the app to meet the following requirements:

- ⇒ Use the Export feature in the app without requiring a restart of the app.
- ⇒ Validate users before users are allowed access to secure resources.
- ⇒ Permit users to access secure resources.

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

**NOTE:** Each correct selection is worth one point.

Hot Area:

**Answer Area**

```

public void Configure(IApplicationBuilder app, IWebHostEnvironment env)
{
    if (env.IsDevelopment())
    {
        app.UseDeveloperExceptionPage();
    }
    else
    {
        app.UseExceptionHandler("/Error");
    }
    app. () ;
    app. () ;
    app. () ;
    app.UseEndpoint(endpoints =>
    {
        endpoints.MapRazorPages();
    });
}

```

**Question #11****Topic 3**

You have an application that includes an Azure Web app and several Azure Function apps. Application secrets including connection strings and certificates are stored in Azure Key Vault.

Secrets must not be stored in the application or application runtime environment. Changes to Azure Active Directory (Azure AD) must be minimized.

You need to design the approach to loading application secrets.

What should you do?

- A. Create a single user-assigned Managed Identity with permission to access Key Vault and configure each App Service to use that Managed Identity.
- B. Create a single Azure AD Service Principal with permission to access Key Vault and use a client secret from within the App Services to access Key Vault.
- C. Create a system assigned Managed Identity in each App Service with permission to access Key Vault.
- D. Create an Azure AD Service Principal with Permissions to access Key Vault for each App Service and use a certificate from within the App Services to access Key Vault.

**Question #12****Topic 3**

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 are developing a medical records document management website. The website is used to store scanned copies of patient intake forms.

If the stored intake forms are downloaded from storage by a third party, the contents of the forms must not be compromised.

You need to store the intake forms according to the requirements.

Solution:

- 1. Create an Azure Key Vault key named skey.
- 2. Encrypt the intake forms using the public key portion of skey.
- 3. Store the encrypted data in Azure Blob storage.

Does the solution meet the goal?

- A. Yes
- B. No

**Question #13****Topic 3**

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 are developing a medical records document management website. The website is used to store scanned copies of patient intake forms.

If the stored intake forms are downloaded from storage by a third party, the contents of the forms must not be compromised.

You need to store the intake forms according to the requirements.

Solution:

- 1. Create an Azure Cosmos DB database with Storage Service Encryption enabled.
- 2. Store the intake forms in the Azure Cosmos DB database.

Does the solution meet the goal?

- A. Yes
- B. No

**Question #14****Topic 3**

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 are developing a medical records document management website. The website is used to store scanned copies of patient intake forms.

If the stored intake forms are downloaded from storage by a third party, the contents of the forms must not be compromised.

You need to store the intake forms according to the requirements.

Solution: Store the intake forms as Azure Key Vault secrets.

Does the solution meet the goal?

- A. Yes
- B. No

Question #15

HOTSPOT -

You plan to deploy a new application to a Linux virtual machine (VM) that is hosted in Azure.

The entire VM must be secured at rest by using industry-standard encryption technology to address organizational security and compliance requirements.

You need to configure Azure Disk Encryption for the VM.

How should you complete the Azure CLI commands? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.

Hot Area:

**Answer Area**

```
az provider register -n Microsoft.KeyVault  
resourcegroup="myResourceGroup"  
az group create --name $resourcegroup --location westus  
keyvault_name=myvaultname$RANDOM  
  
az [▼] create \  
  ▼ [▼]  
    vm  
    keyvault  
    keyvault key  
    vm encryption  
  
    --name $keyvault_name \  
    --resource-group $resourcegroup \  
    --location eastus \  
    --enabled-for-disk-encryption True  
  
az [▼] create \  
  ▼ [▼]  
    vm  
    keyvault  
    keyvault key  
    vm encryption  
  
    --vault-name $keyvault_name \  
    --name Name1 \  
    --protection software  
  
az [▼] create \  
  ▼ [▼]  
    vm  
    keyvault  
    keyvault key  
    vm encryption  
  
    --resource-group $resourcegroup \  
    --name Name2 \  
    --image Canonical:UbuntuServer:16.04-LTS:latest \  
    --admin-username azureuser \  
    --generate-ssh-keys \  
    --data-disk-sizes-gb 5  
  
az [▼] enable\  
  ▼ [▼]  
    vm  
    keyvault  
    keyvault key  
    vm encryption  
  
    --resource-group $resourcegroup \  
    --name Name2 \  
    --disk-encryption-keyvault $keyvault_name \  
    --key-encryption-key Name1 \  
    --volume-type [▼]  
      ▼ [▼]  
        all  
        data  
        os
```

### Question #16

Your company is developing an Azure API hosted in Azure.

You need to implement authentication for the Azure API to access other Azure resources. You have the following requirements:

⇒ All API calls must be authenticated.

⇒ Callers to the API must not send credentials to the API.

Which authentication mechanism should you use?

- A. Basic
- B. Anonymous
- C. Managed identity
- D. Client certificate

### Question #17

Topic 3

DRAG DROP -

You are developing an application. You have an Azure user account that has access to two subscriptions.

You need to retrieve a storage account key secret from Azure Key Vault.

In which order should you arrange the PowerShell commands to develop the solution? To answer, move all commands from the list of commands to the answer area and arrange them in the correct order.

Select and Place:

Powershell commands	Answer Area
<pre>\$secretvalue = ConvertTo-SecureString \$storAcctkey -AsPlainText -Force Set-AzKeyVaultSecret -VaultName \$vaultName -Name \$secretName -SecretValue \$secretvalue</pre>	
<pre>Get-AzStorageAccountKey - ResourceGroupName \$resGroup -Name \$storAcct</pre>	
<pre>Set-AzContext -SubscriptionId \$subscriptionID</pre>	 
<pre>Get-AzKeyVaultSecret -VaultName \$vaultName</pre>	 
<pre>Get-AzSubscription</pre>	

### Question #18

Topic 3

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 develop Azure solutions.

You must grant a virtual machine (VM) access to specific resource groups in Azure Resource Manager.

You need to obtain an Azure Resource Manager access token.

Solution: Use an X.509 certificate to authenticate the VM with Azure Resource Manager.

Does the solution meet the goal?

- A. Yes
- B. No

**Question #19**

Topic 3

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 develop Azure solutions.

You must grant a virtual machine (VM) access to specific resource groups in Azure Resource Manager.

You need to obtain an Azure Resource Manager access token.

Solution: Use the Reader role-based access control (RBAC) role to authenticate the VM with Azure Resource Manager.

Does the solution meet the goal?

- A. Yes
- B. No

**Question #20**

Topic 3

**HOTSPOT**

You are building a website that is used to review restaurants. The website will use an Azure CDN to improve performance and add functionality to requests.

You build and deploy a mobile app for Apple iPhones. Whenever a user accesses the website from an iPhone, the user must be redirected to the app store.

You need to implement an Azure CDN rule that ensures that iPhone users are redirected to the app store.

How should you complete the Azure Resource Manager template? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.

Hot Area:

**Answer Area**

```
"conditions": [ {  
    "name": "IsDevice",  
    "parameters": {  
        "@odata.type": "#Microsoft.Azure.Cdn.Models.  
        "operator": "Equal",  
        "matchValues": [ "  ",  
                       ,  
                       ,  
                       ]  
    } },  
    {  
        "name": "RequestHeader",  
        "parameters": {  
            "@odata.type": "#Microsoft.Azure.Cdn.Models.  
            "operator": "Contains",  
            "selector": "  ",  
                         ,  
                         ,  
                         "  
            "matchValues": [ "  ",  
                            ,  
                            ,  
                            ]  
        } }  
    ]
```

**Question #21**

Topic 3

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 are developing a website that will run as an Azure Web App. Users will authenticate by using their Azure Active Directory (Azure AD) credentials.

You plan to assign users one of the following permission levels for the website: admin, normal, and reader. A user's Azure AD group membership must be used to determine the permission level.

You need to configure authorization.

Solution:

⇒ Configure and use Integrated Windows Authentication in the website.

⇒ In the website, query Microsoft Graph API to load the group to which the user is a member.

Does the solution meet the goal?

- A. Yes
- B. No

**Question #22**

Topic 3

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 develop Azure solutions.

You must grant a virtual machine (VM) access to specific resource groups in Azure Resource Manager.

You need to obtain an Azure Resource Manager access token.

Solution: Run the Invoke-RestMethod cmdlet to make a request to the local managed identity for Azure resources endpoint.

Does the solution meet the goal?

A. Yes

B. No

**Question #23**

Topic 3

**HOTSPOT -**

You are building a website to access project data related to teams within your organization. The website does not allow anonymous access. Authentication is performed using an Azure Active Directory (Azure AD) app named internal.

The website has the following authentication requirements:

⇒ Azure AD users must be able to login to the website.

⇒ Personalization of the website must be based on membership in Active Directory groups.

You need to configure the application's manifest to meet the authentication requirements.

How should you configure the manifest? To answer, select the appropriate configuration in the answer area.

NOTE: Each correct selection is worth one point.

Hot Area:

**Answer Area**

```
{  
    "appId": "d61126e3-089b-4adb-b721-d5023213df7d",  
    "displayName": "internal",  
    "optionalClaims": [{"name": "groupMembershipClaims", "value": "All"}],  
    "requiredResourceAccess": [{"resourceAppId": "d61126e3-089b-4adb-b721-d5023213df7d", "resourceAccess": [{"scope": "User.Read"}]}]  
}
```

**Question #24**

Topic 3

You develop an app that allows users to upload photos and videos to Azure storage. The app uses a storage REST API call to upload the media to a blob storage account named Account1. You have blob storage containers named Container1 and Container2.

Uploading of videos occurs on an irregular basis.

You need to copy specific blobs from Container1 to Container2 when a new video is uploaded.

What should you do?

- A. Copy blobs to Container2 by using the Put Blob operation of the Blob Service REST API
- B. Create an Event Grid topic that uses the Start-AzureStorageBlobCopy cmdlet
- C. Use AzCopy with the Snapshot switch to copy blobs to Container2
- D. Download the blob to a virtual machine and then upload the blob to Container2

#### Question #25

You are developing an ASP.NET Core website that uses Azure FrontDoor. The website is used to build custom weather data sets for researchers. Data sets are downloaded by users as Comma Separated Value (CSV) files. The data is refreshed every 10 hours. Specific files must be purged from the FrontDoor cache based upon Response Header values. You need to purge individual assets from the Front Door cache. Which type of cache purge should you use?

- A. single path
- B. wildcard
- C. root domain

#### Question #26

Your company is developing an Azure API.

You need to implement authentication for the Azure API. You have the following requirements:

All API calls must be secure.



⇒ Callers to the API must not send credentials to the API.

Which authentication mechanism should you use?

- A. Basic
- B. Anonymous
- C. Managed identity
- D. Client certificate

#### Question #27

You are a developer for a SaaS company that offers many web services.

All web services for the company must meet the following requirements:

- ⇒ Use API Management to access the services
- ⇒ Use OpenID Connect for authentication
- ⇒ Prevent anonymous usage

A recent security audit found that several web services can be called without any authentication.

Which API Management policy should you implement?

- A. jsonp
- B. authentication-certificate
- C. check-header
- D. validate-jwt

**Question #28****Topic 3****DRAG DROP -**

Contoso, Ltd. provides an API to customers by using Azure API Management (APIM). The API authorizes users with a JWT token.

You must implement response caching for the APIM gateway. The caching mechanism must detect the user ID of the client that accesses data for a given location and cache the response for that user ID.

You need to add the following policies to the policies file:

- ⇒ a set-variable policy to store the detected user identity
- ⇒ a cache-lookup-value policy
- ⇒ a cache-store-value policy
- ⇒ a find-and-replace policy to update the response body with the user profile information

To which policy section should you add the policies? To answer, drag the appropriate sections to the correct policies. Each section 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.

NOTE: Each correct selection is worth one point.

Select and Place:

**Answer Area**

Policy section	Policy	Policy section
	Set-variable	<input type="text"/>
Inbound	Cache-lookup-value	<input type="text"/>
Outbound	Cache-store-value	<input type="text"/>
	Find-and-replace	<input type="text"/>

**Question #29****Topic 3****DRAG DROP -**

You are developing an Azure solution.

You need to develop code to access a secret stored in Azure Key Vault.

How should you complete the code segment? To answer, drag the appropriate code segments to the correct location. Each code segment 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.

NOTE: Each correct selection is worth one point.

Select and Place:

**Code segments**

- DefaultAzureCredential
- ClientSecretCredential
- CloudClients
- SecretClient

**Answer Area**

```
string var1 = Environment.GetEnvironmentVariable("KEY_VAULT_URI");
var var2 = new  ( new Uri(var1), new  () );
```

**Question #30**

You are developing an Azure App Service REST API.

The API must be called by an Azure App Service web app. The API must retrieve and update user profile information stored in Azure Active Directory (Azure AD).

You need to configure the API to make the updates.

Which two tools should you use? Each correct answer presents part of the solution.

NOTE: Each correct selection is worth one point.

- A. Microsoft Graph API
- B. Microsoft Authentication Library (MSAL)
- C. Azure API Management
- D. Microsoft Azure Security Center
- E. Microsoft Azure Key Vault SDK

### Question #31

You develop a REST API. You implement a user delegation SAS token to communicate with Azure Blob storage. The token is compromised.

You need to revoke the token.

What are two possible ways to achieve this goal? Each correct answer presents a complete solution.

NOTE: Each correct selection is worth one point.

- A. Revoke the delegation key.
- B. Delete the stored access policy.
- C. Regenerate the account key.
- D. Remove the role assignment for the security principle.

### Question #32

Topic 3

DRAG DROP -

You are developing an Azure-hosted application that must use an on-premises hardware security module (HSM) key.

The key must be transferred to your existing Azure Key Vault by using the Bring Your Own Key (BYOK) process.

You need to securely transfer the key to Azure Key Vault.

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

Select and Place:

#### Actions

- Generate a key transfer blob file by using the HSM vendor-provided tool.
- Generate a Key Exchange Key (KEK).
- Create a custom policy definition in Azure Policy.
- Run the `az keyvault key import` Command.
- Run the `az keyvault key restore` command.
- Retrieve the Key Exchange Key (KEK) public key.

#### Answer Area

### Question #33

You develop and deploy an Azure Logic app that calls an Azure Function app. The Azure Function app includes an OpenAPI (Swagger) definition and uses an Azure Blob storage account. All resources are secured by using Azure Active Directory (Azure AD).

The Azure Logic app must securely access the Azure Blob storage account. Azure AD resources must remain if the Azure Logic app is deleted.

You need to secure the Azure Logic app.

What should you do?

- A. Create a user-assigned managed identity and assign role-based access controls.
- B. Create an Azure AD custom role and assign the role to the Azure Blob storage account.
- C. Create an Azure Key Vault and issue a client certificate.
- D. Create a system-assigned managed identity and issue a client certificate.
- E. Create an Azure AD custom role and assign role-based access controls.

**HOTSPOT -**

You are developing an application that uses a premium block blob storage account. You are optimizing costs by automating Azure Blob Storage access tiers.

You apply the following policy rules to the storage account. You must determine the implications of applying the rules to the data. (Line numbers are included for reference only.)

```
01 {
02     "rules": [
03         {
04             "name": "agingDataRule",
05             "enabled": true,
06             "type": "Lifecycle",
07             "definition": {
08                 "filters": {
09                     "blobTypes": [ "blockBlob" ],
10                     "prefixMatch": [ "container1/salesorders", "container2/inventory" ]
11                 },
12                 "actions": {
13                     "baseBlob": {
14                         "tierToCool": { "daysAfterModificationGreaterThan": 60 },
15                         "tierToArchive": { "daysAfterModificationGreaterThan": 120 }
16                     }
17                 }
18             }
19         },
20         {
21             "enabled": true,
22             "name": "lastAccessedDataRule",
23             "type": "Lifecycle",
24             "definition": {
25                 "actions": {
26                     "baseBlob": {
27                         "enableAutoTierToHotFromCool": true,
28                         "tierToCool": {
29                             "daysAfterLastAccessTimeGreaterThan": 30
30                         }
31                     }
32                 },
33                 "filters": {
34                     "blobTypes": [ "blockBlob" ]
35                 }
36             }
37         },
38         {
39             "rules": [
40                 {
41                     "name": "expirationDataRule",
42                     "enabled": true,
43                     "type": "Lifecycle",
44                     "definition": {
45                         "filters": {
46                             "blobTypes": [ "blockBlob" ]
47                         },
48                         "actions": {
49                             "baseBlob": {
50                                 "delete": { "daysAfterModificationGreaterThan": 730 }
51                             }
52                         }
53                     }
54                 }
55             ]
56         }
57     ]
58 }
```

For each of the following statements, select Yes if the statement is true. Otherwise, select No.

NOTE: Each correct selection is worth one point.

Hot Area:

**Answer Area**

Yes	No
<input type="radio"/>	<input type="radio"/>

Block blobs prefixed with container1/salesorders or container2/inventory which have not been modified in over 60 days are moved to cool storage. Blobs that have not been modified in 120 days are moved to the archive tier.

Blobs are moved to cool storage if they have not been accessed for 30 days.

<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------

Blobs will automatically be tiered from cool back to hot if accessed again after being tiered to cool.

<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------

All block blobs older than 730 days will be deleted.

<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------

**Question #35****Topic 3**

You are developing a solution that will use a multi-partitioned Azure Cosmos DB database. You plan to use the latest Azure Cosmos DB SDK for development.

The solution must meet the following requirements:

- ⇒ Send insert and update operations to an Azure Blob storage account.
- ⇒ Process changes to all partitions immediately.
- ⇒ Allow parallelization of change processing.

You need to process the Azure Cosmos DB operations.

What are two possible ways to achieve this goal? Each correct answer presents a complete solution.

NOTE: Each correct selection is worth one point.

- A. Create an Azure App Service API and implement the change feed estimator of the SDK. Scale the API by using multiple Azure App Service instances.
- B. Create a background job in an Azure Kubernetes Service and implement the change feed feature of the SDK.
- C. Create an Azure Function to use a trigger for Azure Cosmos DB. Configure the trigger to connect to the container.
- D. Create an Azure Function that uses a FeedIterator object that processes the change feed by using the pull model on the container. Use a FeedRange object to parallelize the processing of the change feed across multiple functions.

**Question #36****Topic 3**

HOTSPOT -

You have an Azure Web app that uses Cosmos DB as a data store. You create a CosmosDB container by running the following PowerShell script:

```
$resourceGroupName = "testResourceGroup"  
$accountName = "testCosmosAccount"  
$databaseName = "testDatabase"  
$containerName = "testContainer"  
$partitionKeyPath = "/EmployeeId"  
$autoscaleMaxThroughput = 5000
```

```
New-AzCosmosDBSqlContainer -  
-ResourceGroupName $resourceGroupName  
-AccountName $accountName  
-DatabaseName $databaseName  
-Name $containerName  
-PartitionKeyKind Hash  
-PartitionKeyPath $partitionKeyPath  
-AutoscaleMaxThroughput $autoscaleMaxThroughput
```

You create the following queries that target the container:

```
SELECT * FROM c WHERE c.EmployeeId > '12345'  
SELECT * FROM c WHERE c.UserId = '12345'
```

For each of the following statements, select Yes if the statement is true. Otherwise, select No.

NOTE: Each correct selection is worth one point.

Hot Area:

**Answer Area**

<b>Yes</b>	<b>No</b>
------------	-----------

<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------

The minimum throughput for the container is 400 R/U/s.

<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------

The first query statement is an in-partition query.

<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------

The second query statement is a cross-partition query.

**Question #37****Topic 3****HOTSPOT -**

You are developing a web application that makes calls to the Microsoft Graph API. You register the application in the Azure portal and upload a valid X509 certificate. You create an appsettings.json file containing the certificate name, client identifier for the application, and the tenant identifier of the Azure Active Directory (Azure AD). You create a method named ReadCertificate to return the X509 certificate by name.

You need to implement code that acquires a token by using the certificate.

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

NOTE: Each correct selection is worth one point.

Hot Area:

**Answer Area**

```
AuthenticationConfig config = AuthenticationConfig.ReadFromJsonFile("appsettings.json");
X509Certificate2 certificate = ReadCertificate(config.CertificateName);
var app =  .Create(config.ClientId)
    
        ConfidentialClientApplicationBuilder
        GetAccountAsync()
        GetAccountsAsync()
        ConfidentialClientApplication
    .WithCertificate(certificate)
    .WithAuthority(new Uri(config.Authority))
    .Build();
string[] scopes = new string[] { $"{config.ApiUrl}.default" };
AuthenticationResult result = await app.AcquireTokenForClient(
    
        scopes
        app
        config
    ).ExecuteAsync();
```

## Topic 4

**Question #1****Topic 4**

You are developing an ASP.NET Core Web API web service. The web service uses Azure Application Insights for all telemetry and dependency tracking. The web service reads and writes data to a database other than Microsoft SQL Server.

You need to ensure that dependency tracking works for calls to the third-party database.

Which two dependency telemetry properties should you use? Each correct answer presents part of the solution.

NOTE: Each correct selection is worth one point.

- A. Telemetry.Context.Cloud.RoleInstance
- B. Telemetry.Id
- C. Telemetry.Name
- D. Telemetry.Context.Operation.Id
- E. Telemetry.Context.Session.Id

**HOTSPOT -**

You are using Azure Front Door Service.

You are expecting inbound files to be compressed by using Brotli compression. You discover that inbound XML files are not compressed. The files are 9 megabytes (MB) in size.

You need to determine the root cause for the issue.

To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.

Hot Area:

**Answer Area**

Statement	Yes	No
The file MIME type is supported by the service.	<input type="radio"/>	<input type="radio"/>
Edge nodes must be purged of all cache assets.	<input type="radio"/>	<input type="radio"/>
The compression type is supported.	<input type="radio"/>	<input type="radio"/>

**HOTSPOT -**

You are developing an Azure App Service hosted ASP.NET Core web app to deliver video-on-demand streaming media. You enable an Azure Content Delivery Network (CDN) Standard for the web endpoint. Customer videos are downloaded from the web app by using the following example URL: <http://www.contoso.com/content.mp4?quality=1>

All media content must expire from the cache after one hour. Customer videos with varying quality must be delivered to the closest regional point of presence (POP) node.

You need to configure Azure CDN caching rules.

Which options should you use? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.

Hot Area:

**Answer Area**

Setting	Action
Caching behavior	<div style="border: 1px solid black; padding: 5px; width: fit-content;">           Bypass cache            Override            Set if missing         </div>
Cache expiration duration	<div style="border: 1px solid black; padding: 5px; width: fit-content;">           1 second            1 minute            1 hour            1 day         </div>
Query string caching behavior	<div style="border: 1px solid black; padding: 5px; width: fit-content;">           Ignore query strings            Bypass caching for query strings            Cache every unique URL         </div>

**Question #4**

Topic 4

**DRAG DROP -**

You develop a web app that uses tier D1 app service plan by using the Web Apps feature of Microsoft Azure App Service.

Spikes in traffic have caused increases in page load times.

You need to ensure that the web app automatically scales when CPU load is about 85 percent and minimize costs.

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

NOTE: More than one order of answer choices is correct. You will receive credit for any of the correct orders you select.

Select and Place:

Actions	Answer Area
Configure the web app to the Premium App Service tier.	
Configure the web app to the Standard App Service tier.	
Enable autoscaling on the web app.	
Add a Scale rule.	
Switch to an Azure App Services consumption plan.	
Configure a Scale condition.	

**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. Determine whether the solution meets the stated goals.

You are developing and deploying several ASP.NET web applications to Azure App Service. You plan to save session state information and HTML output.

You must use a storage mechanism with the following requirements:

- ⇒ Share session state across all ASP.NET web applications.
- ⇒ Support controlled, concurrent access to the same session state data for multiple readers and a single writer.
- ⇒ Save full HTTP responses for concurrent requests.

You need to store the information.

Proposed Solution: Enable Application Request Routing (ARR).

Does the solution meet the goal?

A. Yes

B. No

**Question #6**

7

Note: This question is part of a series of questions that present the same scenario. Each question in the series contains a unique solution. Determine whether the solution meets the stated goals.

You are developing and deploying several ASP.NET web applications to Azure App Service. You plan to save session state information and HTML output.

You must use a storage mechanism with the following requirements:

- ⇒ Share session state across all ASP.NET web applications.
- ⇒ Support controlled, concurrent access to the same session state data for multiple readers and a single writer.
- ⇒ Save full HTTP responses for concurrent requests.

You need to store the information.

Proposed Solution: Deploy and configure an Azure Database for PostgreSQL. Update the web applications.

Does the solution meet the goal?

A. Yes

B. No

**Question #7**

Topic 4

**HOTSPOT -**

A company is developing a gaming platform. Users can join teams to play online and see leaderboards that include player statistics. The solution includes an entity named Team.

You plan to implement an Azure Redis Cache instance to improve the efficiency of data operations for entities that rarely change.

You need to invalidate the cache when team data is changed.

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

NOTE: Each correct selection is worth one point.

Hot Area:

**Answer Area**

```
void ClearCachedTeams()  
{  
    IDatabase cache = Connection.GetDatabase();  
    ICache cache = Connection.GetDatabase();  
  
    cache.KeyDelete("Team");  
    cache.StringSet("Team", "");  
    cache.ValueDelete("Team");  
    cache.StringGet("Team", "");  
  
    ViewBag.msg += "Team data removed from cache.";  
}
```

**Question #8**

Topic 4

**DRAG DROP -**

A company has multiple warehouses. Each warehouse contains IoT temperature devices which deliver temperature data to an Azure Service Bus queue.

You need to send email alerts to facility supervisors immediately if the temperature at a warehouse goes above or below specified threshold temperatures.

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

Select and Place:

**Actions**

- Add a logic app trigger that fires when one or more messages arrive in the queue.
- Add a Recurrence trigger that schedules the app to run every 15 minutes.
- Add an action that sends an email to specified personnel if the temperature is outside of those thresholds.
- Add a trigger that reads IoT temperature data from a Service Bus queue.
- Add a logic app action that fires when one or more messages arrive in the queue.
- Add a condition that compares the temperature against the upper and lower thresholds.
- Create a blank Logic app.
- Add an action that reads IoT temperature data from the Service Bus queue.

**Answer Area**

**Question #9**

Topic 4

**DRAG DROP -**

You develop an ASP.NET Core MVC application. You configure the application to track webpages and custom events.

You need to identify trends in application usage.

Which Azure Application Insights Usage Analysis features should you use? To answer, drag the appropriate features to the correct requirements. Each feature 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.

NOTE: Each correct selection is worth one point.

Select and Place:

<b>Features</b>	<b>Answer Area</b>	<b>Requirement</b>	<b>Feature</b>
Users		Which pages visited by users most often correlate to a product purchase?	Feature
Funnels		How does load time of the product display page affect a user's decision to purchase a product?	Feature
Impact		Which events most influence a user's decision to continue to use the application?	Feature
Retention		Are there places in the application that users often perform repetitive actions?	Feature
User Flows			Feature

**Question #10**

Topic 4

You develop a gateway solution for a public facing news API. The news API back end is implemented as a RESTful service and uses an OpenAPI specification.

You need to ensure that you can access the news API by using an Azure API Management service instance.

Which Azure PowerShell command should you run?

- A. Import-AzureRmApiManagementApi -Context \$ApiMgmtContext -SpecificationFormat "Swagger" -SpecificationPath \$SwaggerPath -Path \$Path
- B. New-AzureRmApiManagementBackend -Context \$ApiMgmtContext -Url \$Url -Protocol http
- C. New-AzureRmApiManagement -ResourceGroupName \$ResourceGroup -Name \$Name -Location \$Location -Organization \$Org -AdminEmail \$AdminEmail
- D. New-AzureRmApiManagementBackendProxy -Url \$ApiUrl

**Question #11**

Topic 4

You are creating a hazard notification system that has a single signaling server which triggers audio and visual alarms to start and stop.

You implement Azure Service Bus to publish alarms. Each alarm controller uses Azure Service Bus to receive alarm signals as part of a transaction. Alarm events must be recorded for audit purposes. Each transaction record must include information about the alarm type that was activated.

You need to implement a reply trail auditing solution.

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

NOTE: Each correct selection is worth one point.

- A. Assign the value of the hazard message SessionID property to the ReplyToSessionId property.
- B. Assign the value of the hazard message MessageId property to the DeliveryCount property.
- C. Assign the value of the hazard message SessionID property to the SequenceNumber property.
- D. Assign the value of the hazard message MessageId property to the CorrelationId property.
- E. Assign the value of the hazard message SequenceNumber property to the DeliveryCount property.
- F. Assign the value of the hazard message MessageId property to the SequenceNumber property.

**Question #12**

Topic 4

You are developing an Azure function that connects to an Azure SQL Database instance. The function is triggered by an Azure Storage queue.

You receive reports of numerous System.InvalidOperationExceptions with the following message:

'Timeout expired. The timeout period elapsed prior to obtaining a connection from the pool. This may have occurred because all pooled connections were in use and max pool size was reached.'

You need to prevent the exception.

What should you do?

- A. In the host.json file, decrease the value of the batchSize option
- B. Convert the trigger to Azure Event Hub
- C. Convert the Azure Function to the Premium plan
- D. In the function.json file, change the value of the type option to queueScaling

**Question #13**

74

Note: This question is part of a series of questions that present the same scenario. Each question in the series contains a unique solution. Determine whether the solution meets the stated goals.

You are developing and deploying several ASP.NET web applications to Azure App Service. You plan to save session state information and HTML output.

You must use a storage mechanism with the following requirements:

- ⇒ Share session state across all ASP.NET web applications.
- ⇒ Support controlled, concurrent access to the same session state data for multiple readers and a single writer.
- ⇒ Save full HTTP responses for concurrent requests.

You need to store the information.

Proposed Solution: Deploy and configure Azure Cache for Redis. Update the web applications.

Does the solution meet the goal?

- A. Yes
- B. No

**Question #14**

75

**HOTSPOT -**

You are debugging an application that is running on Azure Kubernetes cluster named cluster1. The cluster uses Azure Monitor for containers to monitor the cluster.

The application has sticky sessions enabled on the ingress controller.

Some customers report a large number of errors in the application over the last 24 hours.

You need to determine on which virtual machines (VMs) the errors are occurring.

How should you complete the Azure Monitor query? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.

Hot Area:

**Answer Area**

```
let startTimestamp = ago(1d)  
let ContainerIDs = KubePodInventory  
| where ClusterName == "Cluster1"  
| top ContainerID  
| union ContainerID  
| sample ContainerID  
| distinct ContainerID  
ContainerLog  
| fork ContainerID in (ContainerIDs)  
| where TimeGenerated > startTimestamp  
| where LogEntrySource == "stderr"  
| project by Computer  
| summarize by Computer  
| partition count() by Computer  
| summarize count() by Computer
```

**Question #15**

Topic 4

**HOTSPOT -**

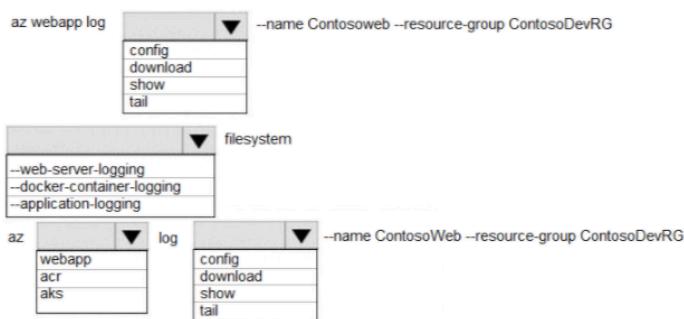
You plan to deploy a web app to App Service on Linux. You create an App Service plan. You create and push a custom Docker image that contains the web app to Azure Container Registry.

You need to access the console logs generated from inside the container in real-time.

How should you complete the Azure CLI command? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.

Hot Area:

**Answer Area****Question #16**

Topic 4

You develop and deploy an ASP.NET web app to Azure App Service. You use Application Insights telemetry to monitor the app.

You must test the app to ensure that the app is available and responsive from various points around the world and at regular intervals. If the app is not responding, you must send an alert to support staff.

You need to configure a test for the web app.

Which two test types can you use? Each correct answer presents a complete solution.

NOTE: Each correct selection is worth one point.

- A. integration
- B. multi-step web
- C. URL ping
- D. unit
- E. load

**Question #17**

Topic 4

**DRAG DROP -**

A web service provides customer summary information for e-commerce partners. The web service is implemented as an Azure Function app with an HTTP trigger.

Access to the API is provided by an Azure API Management instance. The API Management instance is configured in consumption plan mode. All API calls are authenticated by using OAuth.

API calls must be cached. Customers must not be able to view cached data for other customers.

You need to configure API Management policies for caching.

How should you complete the policy statement?

Select and Place:

Targets	Answer Area
Expect	<policies>
Public	<inbound>
Private	<base />
Internal	<cache-lookup caching-type="
External	Target
Authorization	" downstream-caching-type = " Target >
	<vary-by-header>
	Target
	</vary-by-header>
	</cache-lookup>
	</inbound>
	</policies>

#### Question #18

You are developing applications for a company. You plan to host the applications on Azure App Services.

The company has the following requirements:

- ⇒ Every five minutes verify that the websites are responsive.
- ⇒ Verify that the websites respond within a specified time threshold. Dependent requests such as images and JavaScript files must load properly.
- ⇒ Generate alerts if a website is experiencing issues.
- ⇒ If a website fails to load, the system must attempt to reload the site three more times.

You need to implement this process with the least amount of effort.

What should you do?

- A. Create a Selenium web test and configure it to run from your workstation as a scheduled task.
- B. Set up a URL ping test to query the home page.
- C. Create an Azure function to query the home page.
- D. Create a multi-step web test to query the home page.
- E. Create a Custom Track Availability Test to query the home page.

#### Question #19

Topic 4

You develop and add several functions to an Azure Function app that uses the latest runtime host. The functions contain several REST API endpoints secured by using SSL. The Azure Function app runs in a Consumption plan.

You must send an alert when any of the function endpoints are unavailable or responding too slowly.

You need to monitor the availability and responsiveness of the functions.

What should you do?

- A. Create a URL ping test.
- B. Create a timer triggered function that calls `TrackAvailability()` and send the results to Application Insights.
- C. Create a timer triggered function that calls `GetMetric("Request Size")` and send the results to Application Insights.
- D. Add a new diagnostic setting to the Azure Function app. Enable the `FunctionAppLogs` and `Send to Log Analytics` options.

#### Question #20

DRAG DROP -

You are developing an application to retrieve user profile information. The application will use the Microsoft Graph SDK.

The app must retrieve user profile information by using a Microsoft Graph API call.

You need to call the Microsoft Graph API from the application.

In which order should you perform the actions? To answer, move all actions from the list of actions to the answer area and arrange them in the correct order.

Select and Place:

Actions	Answer Area
Create an authentication provider.	
Create a new instance of the GraphServiceClient.	
Invoke the request to the Microsoft Graph API.	
Register the application with the Microsoft identity platform.	
Build a client by using the client app ID.	

**Question #21****Topic 4****DRAG DROP -**

You develop and deploy an Azure Logic App that calls an Azure Function app. The Azure Function App includes an OpenAPI (Swagger) definition and uses an Azure Blob storage account. All resources are secured by using Azure Active Directory (Azure AD).

The Logic App must use Azure Monitor logs to record and store information about runtime data and events. The logs must be stored in the Azure Blob storage account. You need to set up Azure Monitor logs and collect diagnostics data for the Azure Logic App.

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

Select and Place:

Actions	Answer Area
Create action groups and alert rules.	
Create a Log Analytics workspace.	
Install the Logic Apps Management solution.	
Add a diagnostic setting to the Azure Function App.	◀
Create an Azure storage account.	
Add a diagnostic setting to the Azure Logic App.	▶

**Question #22****Topic 4****DRAG DROP -**

You develop an application. You plan to host the application on a set of virtual machines (VMs) in Azure.

You need to configure Azure Monitor to collect logs from the application.

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

Select and Place:

Actions	Answer Area
Create a Log Analytics workspace.	
Install agents on the VM and VM scale set to be monitored.	
Send console logs.	
Add a VMIInsights solution.	
Create an Application Insights resource.	

## Topic 5

**Question #1****Topic 5****DRAG DROP -**

You have an application that provides weather forecasting data to external partners. You use Azure API Management to publish APIs.

You must change the behavior of the API to meet the following requirements:

- ⇒ Support alternative input parameters
- ⇒ Remove formatting text from responses
- ⇒ Provide additional context to back-end services

Which types of policies should you implement? To answer, drag the policy types to the correct scenarios. Each policy 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.

NOTE: Each correct selection is worth one point.

Select and Place:

Policy types	Answer Area	Policy type
Inbound	Requirement	policy type
Outbound	Rewrite the request URL to match to the format expected by the web service.	policy type
Backend	Remove formatting text from responses.	policy type
	Forward the user ID that is associated with the subscription key for the original request to the back-end service.	policy type

## Question #2

Topic 5

You are developing an e-commerce solution that uses a microservice architecture.

You need to design a communication backplane for communicating transactional messages between various parts of the solution. Messages must be communicated in first-in-first-out (FIFO) order.

What should you use?

- A. Azure Storage Queue
- B. Azure Event Hub
- C. Azure Service Bus
- D. Azure Event Grid

## Question #3

Topic 5

### DRAG DROP -

A company backs up all manufacturing data to Azure Blob Storage. Admins move blobs from hot storage to archive tier storage every month.

You must automatically move blobs to Archive tier after they have not been modified within 180 days. The path for any item that is not archived must be placed in an existing queue. This operation must be performed automatically once a month. You set the value of TierAgeInDays to -180.

How should you configure the Logic App? To answer, drag the appropriate triggers or action blocks to the correct trigger or action slots. Each trigger or action block 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.

NOTE: Each correct selection is worth one point.

Select and Place:

The screenshot shows the Microsoft Logic Apps designer interface. On the left, there is a 'Triggers and action blocks' pane containing several items:

- Insert Entity**: Table 'processing', Entity 'Path X'
- Tier blob**: If blob is older than the defined value, tier it to Cool or Archive tier. Blob path 'Path X', Blob tier 'Archive'
- When there are messages in a queue**: QueueName 'processing'
- Recurrence**: Interval '1', Frequency 'Month'
- List blobs 2**: Folder '/items'
- Condition**: Check LastModified timestamp and whether older than the tier age variable. Condition: ticks(@items[For\_each]?['LastModified']) is less than ticks(addDaysInMonth(), variables['TierAgeInDays'])
- Put a message on a queue**: Queue Name 'processing', Message 'Path X'

On the right, there is an 'Answer area' where blocks are being assembled:

- A large blue box labeled 'trigger or action block' (empty)
- An arrow points down to a purple box labeled '(+) Set tier age variable' (empty)
- Another arrow points down to a purple box labeled '(+) List blobs' (empty)
- A 'For each' loop is shown with a purple box labeled 'Scan all blobs in this folder' (empty). It has an input 'value' from the previous step.
- Inside the loop:
  - A blue box labeled 'trigger or action block' (empty)
  - Two branches from a decision box:
    - 'If true': A blue box labeled 'trigger or action block' (empty) with an 'Add an action' button.
    - 'If false': A blue box labeled 'trigger or action block' (empty) with an 'Add an action' button.
  - A blue box labeled 'trigger or action block' (empty) with an 'Add an action' button.

**Question #4****Topic 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 are developing an Azure Service application that processes queue data when it receives a message from a mobile application. Messages may not be sent to the service consistently.

You have the following requirements:

- ⇒ Queue size must not grow larger than 80 gigabytes (GB).
- ⇒ Use first-in-first-out (FIFO) ordering of messages.
- ⇒ Minimize Azure costs.

You need to implement the messaging solution.

Solution: Use the .Net API to add a message to an Azure Service Bus Queue from the mobile application. Create an Azure Function App that uses an Azure Service Bus Queue trigger.

Does the solution meet the goal?

A. Yes

B. No

**Question #5****Topic 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 are developing an Azure solution to collect point-of-sale (POS) device data from 2,000 stores located throughout the world. A single device can produce 2 megabytes (MB) of data every 24 hours. Each store location has one to five devices that send data.

You must store the device data in Azure Blob storage. Device data must be correlated based on a device identifier. Additional stores are expected to open in the future.

You need to implement a solution to receive the device data.

Solution: Provision an Azure Notification Hub. Register all devices with the hub.

Does the solution meet the goal?

A. Yes

B. No

**Question #6****Topic 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 are developing an Azure solution to collect point-of-sale (POS) device data from 2,000 stores located throughout the world. A single device can produce 2 megabytes (MB) of data every 24 hours. Each store location has one to five devices that send data.

You must store the device data in Azure Blob storage. Device data must be correlated based on a device identifier. Additional stores are expected to open in the future.

You need to implement a solution to receive the device data.

Solution: Provision an Azure Service Bus. Configure a topic to receive the device data by using a correlation filter.

Does the solution meet the goal?

A. Yes

B. No

**Question #7****Topic 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 are developing an Azure solution to collect point-of-sale (POS) device data from 2,000 stores located throughout the world. A single device can produce 2 megabytes (MB) of data every 24 hours. Each store location has one to five devices that send data.

You must store the device data in Azure Blob storage. Device data must be correlated based on a device identifier. Additional stores are expected to open in the future.

You need to implement a solution to receive the device data.

Solution: Provision an Azure Event Grid. Configure event filtering to evaluate the device identifier.

Does the solution meet the goal?

A. Yes

B. No

**Question #8****Topic 5**

DRAG DROP -

You manage several existing Logic Apps.

You need to change definitions, add new logic, and optimize these apps on a regular basis.

What should you use? To answer, drag the appropriate tools to the correct functionalities. Each tool 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.

NOTE: Each correct selection is worth one point.

Select and Place:

**Answer Area**

Tools	Functionality	Tool
Logic Apps Designer	Edit B2B workflows	
Code View Editor	Edit definitions in JSON	
Enterprise Integration Pack	Visually add functionality	

**Question #9****Topic 5**

A company is developing a solution that allows smart refrigerators to send temperature information to a central location.

The solution must receive and store messages until they can be processed. You create an Azure Service Bus instance by providing a name, pricing tier, subscription, resource group, and location.

You need to complete the configuration.

Which Azure CLI or PowerShell command should you run?

A.

```
az servicebus queue create
--resource-group fridge-rg
--namespace-name fridge-ns
--name fridge-q
```

B.

```
New-AzureRmResourceGroup
-Name fridge-rg
-Location fridge-loc
```

C.

```
az servicebus namespace create
--resource-group fridge-rg
--name fridge-ns
--location fridge-loc
```

D.

```
connectionString-$)az serviceBus namespace authorization-rule keys list
--resource-group fridge-rg
--fridge-ns fridge-ns
--query primaryConnectionString --output tsv)
```

**HOTSPOT -**

You are developing an application that uses Azure Storage Queues.

You have the following code:

```
CloudStorageAccount storageAccount = CloudStorageAccount.Parse
(CloudConfigurationManager.GetSetting("StorageConnectionString"));
CloudQueueClient queueClient = storageAccount.CreateCloudQueueClient();

CloudQueue queue = queueClient.GetQueueReference("appqueue");
await queue.CreateIfNotExistsAsync();

CloudQueueMessage peekedMessage = await queue.PeekMessageAsync();
if (peekedMessage != null)
{
    Console.WriteLine("The peeked message is: {0}", peekedMessage.AsString);
}
CloudQueueMessage message = await queue.GetMessageAsync();
```

For each of the following statements, select Yes if the statement is true. Otherwise, select No.

NOTE: Each correct selection is worth one point.

Hot Area:

**Answer Area**

Statement	Yes	No
The code configures the lock duration for the queue.	<input type="radio"/>	<input type="radio"/>
The last message read remains in the queue after the code runs.	<input type="radio"/>	<input type="radio"/>
The storage queue remains in the storage account after the code runs.	<input type="radio"/>	<input type="radio"/>

A company is developing a solution that allows smart refrigerators to send temperature information to a central location.

The solution must receive and store messages until they can be processed. You create an Azure Service Bus instance by providing a name, pricing tier, subscription, resource group, and location.

You need to complete the configuration.

Which Azure CLI or PowerShell command should you run?

A.

```
az group create
--name fridge-rg
--location fridge-loc
```

B.

```
New-AzureRmServiceBusNamespace
-ResourceGroupName fridge-rg
-NamespaceName fridge-ns
-Location fridge-loc
```

C.

```
New-AzureRmServiceBusQueue
-ResourceGroupName fridge-rg
-NamespaceName fridge-ns
-Name fridge-q
-EnablePartitioning $False
```

D.

```
az servicebus namespace create
--resource-group fridge-rg
--name fridge-rg
--location fridge-loc
```

**Question #12****Topic 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 are developing an Azure Service application that processes queue data when it receives a message from a mobile application. Messages may not be sent to the service consistently.

You have the following requirements:

- ⇒ Queue size must not grow larger than 80 gigabytes (GB).
- ⇒ Use first-in-first-out (FIFO) ordering of messages.
- ⇒ Minimize Azure costs.

You need to implement the messaging solution.

Solution: Use the .Net API to add a message to an Azure Storage Queue from the mobile application. Create an Azure Function App that uses an Azure Storage Queue trigger.

Does the solution meet the goal?

- A. Yes
- B. No

**Question #13****Topic 5**

DRAG DROP -

You develop software solutions for a mobile delivery service. You are developing a mobile app that users can use to order from a restaurant in their area. The app uses the following workflow:

1. A driver selects the restaurants for which they will deliver orders.
2. Orders are sent to all available drivers in an area.
3. Only orders for the selected restaurants will appear for the driver.
4. The first driver to accept an order removes it from the list of available orders.

You need to implement an Azure Service Bus solution.

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

Select and Place:

Actions	Answer Area
Create a single Service Bus topic.	
Create a Service Bus Namespace for each restaurant for which a driver can receive messages.	
Create a single Service Bus subscription.	
Create a Service Bus subscription for each restaurant for which a driver can receive orders.	
Create a single Service Bus Namespace.	
Create a Service Bus topic for each restaurant for which a driver can receive messages.	

#### Question #14

To

##### HOTSPOT -

You develop a news and blog content app for Windows devices.

A notification must arrive on a user's device when there is a new article available for them to view.

You need to implement push notifications.

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

NOTE: Each correct selection is worth one point.

Hot Area:

#### Answer Area

```
string notificationHubName = "contoso_hub";
string notificationHubConnection = "connection_string";
hub =
NotificationHubClient
NotificationHubClientSettings
NotificationHubJob
NotificationDetails

NotificationHubClient
NotificationHubClientSettings
NotificationHubJob
NotificationDetails

(notificationHubConnection, notificationHubName);
string windowsToastPayload =
@"><toast><visual><binding template=""ToastText01""><text id=""1"">" +
@"New item to view" + @"</text></binding></visual></toast>";
try
{
var result =
await hub.
SendWindowsNativeNotificationAsync
SubmitNotificationHubJobAsync
ScheduleNotificationAsync
SendAppleNativeNotificationAsync
}

}
catch (System.Exception ex)
{
...
}
```

#### Question #15

You are developing an Azure messaging solution.

You need to ensure that the solution meets the following requirements:

- ☞ Provide transactional support.
- ☞ Provide duplicate detection.
- ☞ Store the messages for an unlimited period of time.

Which two technologies will meet the requirements? Each correct answer presents a complete solution.

NOTE: Each correct selection is worth one point.

- A. Azure Service Bus Topic
- B. Azure Service Bus Queue
- C. Azure Storage Queue
- D. Azure Event Hub

**Question #16**

Topic

**DRAG DROP -**

You develop a gateway solution for a public facing news API.

The news API back end is implemented as a RESTful service and hosted in an Azure App Service instance.

You need to configure back-end authentication for the API Management service instance.

Which target and gateway credential type should you use? To answer, drag the appropriate values to the correct parameters. Each value 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.

NOTE: Each correct selection is worth one point.

Select and Place:

Values	Answer Area
Azure Resource	Configuration parameter
HTTP(s) endpoint	Target
Basic	Gateway credentials
Client cert	

**Question #17****HOTSPOT -**

You are creating an app that uses Event Grid to connect with other services. Your app's event data will be sent to a serverless function that checks compliance.

This function is maintained by your company.

You write a new event subscription at the scope of your resource. The event must be invalidated after a specific period of time.

You need to configure Event Grid.

What should you do? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.

Hot Area:

Answer Area				
Option	Value			
WebHook event delivery	<table border="1"><tr><td>SAS tokens</td></tr><tr><td>Key authentication</td></tr><tr><td>Management Access Control</td></tr></table>	SAS tokens	Key authentication	Management Access Control
SAS tokens				
Key authentication				
Management Access Control				
Topic publishing	<table border="1"><tr><td>ValidationCode handshake</td></tr><tr><td>ValidationURL handshake</td></tr><tr><td>JWT token</td></tr></table>	ValidationCode handshake	ValidationURL handshake	JWT token
ValidationCode handshake				
ValidationURL handshake				
JWT token				

#### Question #18

HOTSPOT -

You are working for Contoso, Ltd.

You define an API Policy object by using the following XML markup:

```
<set-variable name="bodySize" value="@{context.Request.Headers["Content-Length"] [0]}"/>
<choose>
<when condition="@(int.Parse(context.Variables.GetValueOrDefault<string> ("bodySize"))<512000)">
</when>
<otherwise>
    <rewrite-uri template="/put"/>
    <set-backend-service base-url="http://contoso.com/api/9.1/">
</otherwise>
</choose>
```

For each of the following statements, select Yes if the statement is true. Otherwise, select No.

NOTE: Each correct selection is worth one point.

Hot Area:

#### Answer Area

Statement	Yes	No
-----------	-----	----

The XML segment belongs in the <inbound> section of the policy.

If the body size is >256k, an error will occur.

If the request is http://contoso.com/api/9.2/, the policy will retain the higher version.

#### Question #19

You are developing a solution that will use Azure messaging services.

You need to ensure that the solution uses a publish-subscribe model and eliminates the need for constant polling.

What are two possible ways to achieve the goal? Each correct answer presents a complete solution.

NOTE: Each correct selection is worth one point.

- A. Service Bus
- B. Event Hub
- C. Event Grid
- D. Queue

#### Question #20

Topic 5

A company is implementing a publish-subscribe (Pub/Sub) messaging component by using Azure Service Bus. You are developing the first subscription application.

In the Azure portal you see that messages are being sent to the subscription for each topic. You create and initialize a subscription client object by supplying the correct details, but the subscription application is still not consuming the messages.

You need to ensure that the subscription client processes all messages.

Which code segment should you use?

- A. await subscriptionClient.AddRuleAsync(new RuleDescription(RuleDescription.DefaultRuleName, new TrueFilter()));
- B. subscriptionClient = new SubscriptionClient(ServiceBusConnectionString, TopicName, SubscriptionName);
- C. await subscriptionClient.CloseAsync();
- D. subscriptionClient.RegisterMessageHandler(ProcessMessagesAsync, messageHandlerOptions);

**Question #21****Topic 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.

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You are developing an Azure Service application that processes queue data when it receives a message from a mobile application. Messages may not be sent to the service consistently.

You have the following requirements:

- ⇒ Queue size must not grow larger than 80 gigabytes (GB).
- ⇒ Use first-in-first-out (FIFO) ordering of messages.
- ⇒ Minimize Azure costs.

You need to implement the messaging solution.

Solution: Use the .Net API to add a message to an Azure Storage Queue from the mobile application. Create an Azure VM that is triggered from Azure Storage Queue events.

Does the solution meet the goal?

A. Yes

B. No

**Question #22****Topic 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.

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You are developing an Azure Service application that processes queue data when it receives a message from a mobile application. Messages may not be sent to the service consistently.

You have the following requirements:

- ⇒ Queue size must not grow larger than 80 gigabytes (GB).
- ⇒ Use first-in-first-out (FIFO) ordering of messages.
- ⇒ Minimize Azure costs.

You need to implement the messaging solution.

Solution: Use the .Net API to add a message to an Azure Service Bus Queue from the mobile application. Create an Azure Windows VM that is triggered from Azure Service Bus Queue.

Does the solution meet the goal?

A. Yes

B. No

**Question #23****Topic 5**

DRAG DROP -

You are developing a REST web service. Customers will access the service by using an Azure API Management instance.

The web service does not correctly handle conflicts. Instead of returning an HTTP status code of 409, the service returns a status code of 500. The body of the status message contains only the word conflict.

You need to ensure that conflicts produce the correct response.

How should you complete the policy? To answer, drag the appropriate code segments to the correct locations. Each code segment 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.

NOTE: Each correct selection is worth one point.

Select and Place:

**Policy segments**

server  
context  
on-error  
set-status  
when-error  
override-status

**Answer Area**

```
< Policy segment >
<base />
<choose>
  <when condition = " @ Policy segment .Response.StatusCode == 500
    && Policy segment .LastError.Message.Contains
      <return-response>
        < Policy segment >
        </return-response>
      </when>
      <otherwise />
    </choose>
< Policy segment >
```

**Question #24****Topic 5****DRAG DROP -**

You are a developer for a Software as a Service (SaaS) company. You develop solutions that provide the ability to send notifications by using Azure Notification Hubs.

You need to create sample code that customers can use as a reference for how to send raw notifications to Windows Push Notification Services (WNS) devices. The sample code must not use external packages.

How should you complete the code segment? To answer, drag the appropriate code segments to the correct locations. Each code segment 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.

NOTE: Each correct selection is worth one point.

Select and Place:

**Code segments**

- raw
- windows
- windowsphone
- application/xml
- application/json
- application/octet-stream

**Answer Area**

```
var endpoint = "...";
var payload = "...";
var request = new HttpRequestMessage(HttpMethod.Post, endpoint);
request.Headers.Add("X-WNS-Type", "wns/raw");
request.Headers.Add("ServiceBusNotification-Format", "Code segment");
request.Content = new StringContent(payload, Encoding.UTF8, "Code segment");
var client = new HttpClient();
await client.SendAsync(request);
```

**Question #25****Topic 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.

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You are developing an Azure solution to collect point-of-sale (POS) device data from 2,000 stores located throughout the world. A single device can produce 2 megabytes (MB) of data every 24 hours. Each store location has one to five devices that send data.

You must store the device data in Azure Blob storage. Device data must be correlated based on a device identifier. Additional stores are expected to open in the future.

You need to implement a solution to receive the device data.

Solution: Provision an Azure Event Hub. Configure the machine identifier as the partition key and enable capture.

Does the solution meet the goal?

- A. Yes
- B. No

**Question #26****Topic 5****DRAG DROP -**

You are developing an Azure solution to collect inventory data from thousands of stores located around the world. Each store location will send the inventory data hourly to an Azure Blob storage account for processing.

The solution must meet the following requirements:

- ⇒ Begin processing when data is saved to Azure Blob storage.
- ⇒ Filter data based on store location information.
- ⇒ Trigger an Azure Logic App to process the data for output to Azure Cosmos DB.
- ⇒ Enable high availability and geographic distribution.
- ⇒ Allow 24-hours for retries.
- ⇒ Implement an exponential back off data processing.

You need to configure the solution.

What should you implement? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.

Select and Place:

<b>Technologies</b>
Azure Event Hub
Azure Event Grid
Azure Service Bus
Azure Blob Storage
Azure App Service
Azure Logic App

<b>Answer Area</b>	<b>Object</b>	<b>Technology</b>
	Event Source	Technology
	Event Receiver	Technology
	Event Handler	Technology

## Topic 6

**Question #1****Topic 6**

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.

Your company has an azure subscription that includes a storage account, a resource group, a blob container and a file share.

A fellow administrator named Jon Ross used an Azure Resource Manager template to deploy a virtual machine and an Azure Storage account.

You need to identify the Azure Resource Manager template the Jon Ross used.

Solution: You access the Container blade.

Does the solution meet the goal?

- A. Yes
- B. No

**Question #2****Topic 6**

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.

Your company has an azure subscription that includes a storage account, a resource group, a blob container and a file share.

A fellow administrator named Jon Ross used an Azure Resource Manager template to deploy a virtual machine and an Azure Storage account.

You need to identify the Azure Resource Manager template the Jon Ross used.

Solution: You access the Virtual Machine blade.

Does the solution meet the goal?

- A. Yes
- B. No

### Question #3

Topic

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.

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Your company has an Azure subscription that includes a storage account, a resource group, a blob container and a file share.

A fellow administrator named Jon Ross used an Azure Resource Manager template to deploy a virtual machine and an Azure Storage account.

You need to identify the Azure Resource Manager template the Jon Ross used.

Solution: You access the Resource Group blade.

Does the solution meet the goal?

A. Yes

B. No

### Question #4

You have two Hyper-V hosts named Host1 and Host2. Host1 has an Azure virtual machine named VM1 that was deployed by using a custom Azure Resource Manager template.

You need to move VM1 to Host2.

What should you do?

A. From the Update management blade, click Enable.

B. From the Overview blade, move VM1 to a different subscription.

C. From the Redeploy blade, click Redeploy.

D. From the Profile blade, modify the usage location.

### Question #5

Your company has an Azure Kubernetes Service (AKS) cluster that you manage from an Azure AD-joined device. The cluster is located in a resource group.

Developers have created an application named MyApp. MyApp was packaged into a container image.

You need to deploy the YAML manifest file for the application.

Solution: You install the Azure CLI on the device and run the kubectl apply -f myapp.yaml command.

Does this meet the goal?

A. Yes

B. No

### Question #6

Your company has an Azure Kubernetes Service (AKS) cluster that you manage from an Azure AD-joined device. The cluster is located in a resource group.

Developers have created an application named MyApp. MyApp was packaged into a container image.

You need to deploy the YAML manifest file for the application.

Solution: You install the docker client on the device and run the docker run -it microsoft/azure-cli:0.10.17 command.

Does this meet the goal?

A. Yes

B. No

**Question #7****Topic 6**

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 are developing a web app named mywebapp1. Mywebapp1 uses the address myapp1.azurewebsites.net. You protect mywebapp1 by implementing an Azure Web Application Firewall (WAF). The traffic to mywebapp1 is routed through an Azure Application Gateway instance that is also used by other web apps.

You want to secure all traffic to mywebapp1 by using SSL.

Solution: You open the Azure Application Gateway's HTTP setting and set the Override backend path option to mywebapp1.azurewebsites.net. You then enable the Use for App service option.

Does this meet the goal?

A. Yes

B. No

**Question #8****Topic 6**

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 are developing a web app named mywebapp1. Mywebapp1 uses the address myapp1.azurewebsites.net. You protect mywebapp1 by implementing an Azure Web Application Firewall (WAF). The traffic to mywebapp1 is routed through an Azure Application Gateway instance that is also used by other web apps.

You want to secure all traffic to mywebapp1 by using SSL.

Solution: You configure mywebapp1 to run in an Azure App service environment (ASE).

Does this meet the goal?

A. Yes

B. No

**Question #9****Topic 6**

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 are developing a web app named mywebapp1. Mywebapp1 uses the address myapp1.azurewebsites.net. You protect mywebapp1 by implementing an Azure Web Application Firewall (WAF). The traffic to mywebapp1 is routed through an Azure Application Gateway instance that is also used by other web apps.

You want to secure all traffic to mywebapp1 by using SSL.

Solution: You open the Azure Application Gateway's HTTP setting and set the Override backend path option to mywebapp1.azurewebsites.net. You then add an authentication certificate for mywebapp1.azurewebsites.net.

Does this meet the goal?

A. Yes

B. No

**Question #10****Topic 6**

Your company has a web app named WebApp1.

You use the WebJobs SDK to design a triggered App Service background task that automatically invokes a function in the code every time new data is received in a queue.

You are preparing to configure the service processes a queue data item.

Which of the following is the service you should use?

A. Logic Apps

B. WebJobs

C. Flow

D. Functions

**Question #11****Topic 6**

Your company has an Azure subscription.

You need to deploy a number of Azure virtual machines to the subscription by using Azure Resource Manager (ARM) templates. The virtual machines will be included in a single availability set.

You need to ensure that the ARM template allows for as many virtual machines as possible to remain accessible in the event of fabric failure or maintenance.

Which of the following is the value that you should configure for the platformFaultDomainCount property?

- A. 10
- B. 30
- C. Min Value
- D. Max Value

**Question #12****Topic 6**

Your company has an Azure subscription.

You need to deploy a number of Azure virtual machines to the subscription by using Azure Resource Manager (ARM) templates. The virtual machines will be included in a single availability set.

You need to ensure that the ARM template allows for as many virtual machines as possible to remain accessible in the event of fabric failure or maintenance.

Which of the following is the value that you should configure for the platformUpdateDomainCount property?

- A. 10
- B. 20
- C. 30
- D. 40

**Question #13****Topic 6**

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 are designing an Azure WebJob that will run on the same instances as a web app.

You want to make use of a suitable WebJob type. The webjob type should also allow for the option to restrict the WebJob to a single instance.

Solution: You configure the use of the Triggered WebJob type.

Does the solution meet the goal?

- A. Yes
- B. No

**Question #14****Topic 6**

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 are designing an Azure WebJob that will run on the same instances as a web app.

You want to make use of a suitable WebJob type. The webjob type should also allow for the option to restrict the WebJob to a single instance.

Solution: You configure the use of the Continuous WebJob type.

Does the solution meet the goal?

- A. Yes
- B. No

**Question #15****Topic 6**

This question requires that you evaluate the underlined text to determine if it is correct.

You company has an on-premises deployment of MongoDB, and an Azure Cosmos DB account that makes use of the MongoDB API.

You need to devise a strategy to migrate MongoDB to the Azure Cosmos DB account.

You include the Data Management Gateway tool in your migration strategy.

Instructions: Review the underlined text. If it makes the statement correct, select 'No change required.' If the statement is incorrect, select the answer choice that makes the statement correct.

A. No change required

B. mongorestore

C. Azure Storage Explorer

D. AzCopy

**Question #16****Topic 6**

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 are developing an application that processes Azure Blob storage events.

Your application has the following requirements:

Process transaction logs asynchronously for changes that occur to the blobs and the blob metadata.

Process changes in the order in which they occurred.

Retain changes for compliance reasons.

Solution: You use Azure Event Grid with a subscriber Azure Function app.

Does the solution meet the goal?

A. Yes

B. No

**Question #17****Topic 6**

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.

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You are developing an application that processes Azure Blob storage events.

Your application has the following requirements:

Process transaction logs asynchronously for changes that occur to the blobs and the blob metadata.

Process changes in the order in which they occurred.

Retain changes for compliance reasons.

Solution: You use Azure Monitor HTTP Data Collector API.

Does the solution meet the goal?

A. Yes

B. No

**Question #18****Topic**

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 are developing a mobile app that uses an Azure SQL Database named Weyland.

The database contains a table named Customers that has a field named email\_address.

You want to implement dynamic data masking to hide the data in the email\_address field.

Solution: You run the following transact-SQL statement:

```
ALTER TABLE [dbo].[Weyland].[Customers]
```

```
ALTER COLUMN [email_address]
```

```
ADD MASKED WITH (FUNCTION = 'email()')
```

Does the solution meet the goal?

A. Yes

B. No

**Question #19****Topic 6**

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 are developing a mobile app that uses an Azure SQL Database named Weyland.

The database contains a table named Customers that has a field named email\_address.

You want to implement dynamic data masking to hide the data in the email\_address field.

Solution: You run the Set-AzSqlDatabaseDataMaskingPolicy -DatabaseName "Weyland" Powershell cmdlet

Does the solution meet the goal?

A. Yes

B. No

**Question #20****Topic 6**

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 are developing a mobile app that uses an Azure SQL Database named Weyland.

The database contains a table named Customers that has a field named email\_address.

You want to implement dynamic data masking to hide the data in the email\_address field.

Solution: You run the Set-AzSqlDatabaseDataMaskingRule

-DatabaseName "Weyland" -SchemaName "dbo"

-TableName "Customers" -ColumnName "email\_address"

-MaskingFunction "email" Powershell cmdlet

Does the solution meet the goal?

A. Yes

B. No

**Question #21**

You are developing an e-Commerce Web App.

You want to use Azure Key Vault to ensure that sign-ins to the e-Commerce Web App are secured by using Azure App Service authentication and Azure Active Directory (AAD).

What should you do on the e-Commerce Web App?

A. Run the az keyvault secret command.

B. Enable Azure AD Connect.

C. Enable Managed Service Identity (MSI).

D. Create an Azure AD service principal.

**Question #22**

You are developing a web app that uses Azure Active Directory (Azure AD) for authentication.

You want to configure the web app to use multifactor authentication.

What should you do?

A. Enable mobile app authentication.

B. In Azure AD conditional access, enable the baseline policy.

C. In Azure AD, create a conditional access policy.

D. Install the Azure Multi-Factor Authentication Server.

**Question #23**

Topic C

This question requires that you evaluate the underlined text to determine if it is correct.

Your Azure Active Directory (Azure AD) tenant has an Azure subscription linked to it.

Your developer has created a mobile application that obtains Azure AD access tokens using the OAuth 2 implicit grant type.

The mobile application must be registered in Azure AD.

You require a redirect URI from the developer for registration purposes.

Instructions: Review the underlined text. If it makes the statement correct, select "No change is needed." If the statement is incorrect, select the answer choice that makes the statement correct.

- A. No change required.
- B. a secret
- C. a login hint
- D. a client ID

**Question #24**

You are creating an Azure key vault using PowerShell. Objects deleted from the key vault must be kept for a set period of 90 days.

Which two of the following parameters must be used in conjunction to meet the requirement? (Choose two.)

- A. EnabledForDeployment
- B. EnablePurgeProtection
- C. EnabledForTemplateDeployment
- D. EnableSoftDelete

**Question #25**

Topic C

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.

Your company has an Azure Active Directory (Azure AD) environment. Users occasionally connect to Azure AD via the Internet.

You need to ensure that users who connect to Azure AD via the internet using an unidentified IP address, are automatically instructed to change their passwords.

Solution: You configure the use of Azure Key Vault.

Does the solution meet the goal?

- A. Yes
- B. No

**Question #26**

Topic C

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.

Your company has an Azure Active Directory (Azure AD) environment. Users occasionally connect to Azure AD via the Internet.

You need to ensure that users who connect to Azure AD via the internet using an unidentified IP address, are automatically instructed to change their passwords.

Solution: You configure the use of Azure AD Identity Protection.

Does the solution meet the goal?

- A. Yes
- B. No

**Question #27****Topic 6**

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.

Your company has an Azure Active Directory (Azure AD) environment. Users occasionally connect to Azure AD via the Internet.

You need to ensure that users who connect to Azure AD via the internet using an unidentified IP address, are automatically instructed to change their passwords.

Solution: You configure the use of Azure AD Privileged Identity Management.

Does the solution meet the goal?

A. Yes

B. No

**Question #28****Topic 6**

You manage an Azure SQL database that allows for Azure AD authentication.

You need to make sure that database developers can connect to the SQL database via Microsoft SQL Server Management Studio (SSMS). You also need to make sure the developers use their on-premises Active Directory account for authentication. Your strategy should allow for authentication prompts to be kept to a minimum.

Which of the following should you implement?

A. Azure AD token.

B. Azure Multi-Factor authentication.

C. Active Directory integrated authentication.

D. OATH software tokens.

**Question #29****Topic 6**

You are developing an application to transfer data between on-premises file servers and Azure Blob storage. The application stores keys, secrets, and certificates in Azure Key Vault and makes use of the Azure Key Vault APIs.

You want to configure the application to allow recovery of an accidental deletion of the key vault or key vault objects for 90 days after deletion.

What should you do?

A. Run the Add-AzKeyVaultKey cmdlet.

B. Run the az keyvault update --enable-soft-delete true --enable-purge-protection true CLI.

C. Implement virtual network service endpoints for Azure Key Vault.

D. Run the az keyvault update --enable-soft-delete false CLI.

**Question #30****Topic 6**

Note: The question is included in a number of questions that depicts the identical set-up. However, every question has a distinctive result. Establish if the solution satisfies the requirements.

You are configuring a web app that delivers streaming video to users. The application makes use of continuous integration and deployment.

You need to ensure that the application is highly available and that the users' streaming experience is constant. You also want to configure the application to store data in a geographic location that is nearest to the user.

Solution: You include the use of Azure Redis Cache in your design.

Does the solution meet the goal?

A. Yes

B. No

**Question #31****Topic 6**

Note: The question is included in a number of questions that depicts the identical set-up. However, every question has a distinctive result. Establish if the solution satisfies the requirements.

You are configuring a web app that delivers streaming video to users. The application makes use of continuous integration and deployment.

You need to ensure that the application is highly available and that the users' streaming experience is constant. You also want to configure the application to store data in a geographic location that is nearest to the user.

Solution: You include the use of an Azure Content Delivery Network (CDN) in your design.

Does the solution meet the goal?

A. Yes

B. No

**Question #32****Topic 6**

Note: The question is included in a number of questions that depicts the identical set-up. However, every question has a distinctive result. Establish if the solution satisfies the requirements.

You are configuring a web app that delivers streaming video to users. The application makes use of continuous integration and deployment.

You need to ensure that the application is highly available and that the users' streaming experience is constant. You also want to configure the application to store data in a geographic location that is nearest to the user.

Solution: You include the use of a Storage Area Network (SAN) in your design.

Does the solution meet the goal?

A. Yes

B. No

**Question #33**

You develop a Web App on a tier D1 app service plan.

You notice that page load times increase during periods of peak traffic.

You want to implement automatic scaling when CPU load is above 80 percent. Your solution must minimize costs.

What should you do first?

- A. Enable autoscaling on the Web App.
- B. Switch to the Premium App Service tier plan.
- C. Switch to the Standard App Service tier plan.
- D. Switch to the Azure App Services consumption plan.

**Question #34****Topic**

Your company's Azure subscription includes an Azure Log Analytics workspace.

Your company has a hundred on-premises servers that run either Windows Server 2012 R2 or Windows Server 2016, and is linked to the Azure Log Analytics workspace.

The Azure Log Analytics workspace is set up to gather performance counters associated with security from these linked servers.

You must configure alerts based on the information gathered by the Azure Log Analytics workspace.

You have to make sure that alert rules allow for dimensions, and that alert creation time should be kept to a minimum. Furthermore, a single alert notification must be created when the alert is created and when the alert is resolved.

You need to make use of the necessary signal type when creating the alert rules.

Which of the following is the option you should use?

- A. The Activity log signal type.
- B. The Application Log signal type.
- C. The Metric signal type.
- D. The Audit Log signal type.

### Question #35

You are developing a .NET Core MVC application that allows customers to research independent holiday accommodation providers.  
You want to implement Azure Search to allow the application to search the index by using various criteria to locate documents related to accommodation.  
You want the application to allow customers to search the index by using regular expressions.  
What should you do?

- A. Configure the SearchMode property of the SearchParameters class.
- B. Configure the QueryType property of the SearchParameters class.
- C. Configure the Facets property of the SearchParameters class.
- D. Configure the Filter property of the SearchParameters class.

### Question #36

You are a developer at your company.  
You need to update the definitions for an existing Logic App.  
What should you use?

- A. the Enterprise Integration Pack (EIP)
- B. the Logic App Code View
- C. the API Connections
- D. the Logic Apps Designer

### Question #37

*Top*

Note: The question is included in a number of questions that depicts the identical set-up. However, every question has a distinctive result. Establish if the solution satisfies the requirements.

You are developing a solution for a public facing API.

The API back end is hosted in an Azure App Service instance. You have implemented a RESTful service for the API back end.

You must configure back-end authentication for the API Management service instance.

Solution: You configure Basic gateway credentials for the Azure resource.

Does the solution meet the goal?

- A. Yes
- B. No

**Question #38**[Topic](#)

Note: The question is included in a number of questions that depicts the identical set-up. However, every question has a distinctive result. Establish if the solution satisfies the requirements.

You are developing a solution for a public facing API.

The API back end is hosted in an Azure App Service instance. You have implemented a RESTful service for the API back end.

You must configure back-end authentication for the API Management service instance.

Solution: You configure Client cert gateway credentials for the HTTP(s) endpoint.

Does the solution meet the goal?

A. Yes

B. No

**Question #39**[Topic](#)

Note: The question is included in a number of questions that depicts the identical set-up. However, every question has a distinctive result. Establish if the solution satisfies the requirements.

You are developing a solution for a public facing API.

The API back end is hosted in an Azure App Service instance. You have implemented a RESTful service for the API back end.

You must configure back-end authentication for the API Management service instance.

Solution: You configure Basic gateway credentials for the HTTP(s) endpoint.

Does the solution meet the goal?

A. Yes

B. No

**Question #40**[Topic](#)

Note: The question is included in a number of questions that depicts the identical set-up. However, every question has a distinctive result. Establish if the solution satisfies the requirements.

You are developing a solution for a public facing API.

The API back end is hosted in an Azure App Service instance. You have implemented a RESTful service for the API back end.

You must configure back-end authentication for the API Management service instance.

Solution: You configure Client cert gateway credentials for the Azure resource.

Does the solution meet the goal?

A. Yes

B. No

**Question #41**[Topic](#)

You are developing a .NET Core MVC application that allows customers to research independent holiday accommodation providers.

You want to implement Azure Search to allow the application to search the index by using various criteria to locate documents related to accommodation venues.

You want the application to list holiday accommodation venues that fall within a specific price range and are within a specified distance to an airport.

What should you do?

A. Configure the SearchMode property of the SearchParameters class.

B. Configure the QueryType property of the SearchParameters class.

C. Configure the Facets property of the SearchParameters class.

D. Configure the Filter property of the SearchParameters class.

## Question #42

You are a developer at your company.

You need to edit the workflows for an existing Logic App.

What should you use?

- A. the Enterprise Integration Pack (EIP)
- B. the Logic App Code View
- C. the API Connections
- D. the Logic Apps Designer

## Question #43

7c

You are developing an application that applies a set of governance policies for internal and external services, as well as for applications.

You develop a stateful ASP.NET Core 2.1 web application named PolicyApp and deploy it to an Azure App Service Web App. The PolicyApp reacts to events from Azure Event Grid and performs policy actions based on those events.

You have the following requirements:

Authentication events must be used to monitor users when they sign in and sign out.

All authentication events must be processed by PolicyApp.

Sign outs must be processed as fast as possible.

What should you do?

- A. Create a new Azure Event Grid subscription for all authentication events. Use the subscription to process sign-out events.
- B. Create a separate Azure Event Grid handler for sign-in and sign-out events.
- C. Create separate Azure Event Grid topics and subscriptions for sign-in and sign-out events.
- D. Add a subject prefix to sign-out events. Create an Azure Event Grid subscription. Configure the subscription to use the subjectBeginsWith filter.

## Topic 7

**Introductory Info**

Case study -

This is a case study. Case studies are not timed separately. You can use as much exam time as you would like to complete each case. However, there may be additional case studies and sections on this exam. You must manage your time to ensure that you are able to complete all questions included on this exam in the time provided.

To answer the questions included in a case study, you will need to reference information that is provided in the case study. Case studies might contain exhibits and other resources that provide more information about the scenario that is described in the case study. Each question is independent of the other questions in this case study.

At the end of this case study, a review screen will appear. This screen allows you to review your answers and to make changes before you move to the next section of the exam. After you begin a new section, you cannot return to this section.

To start the case study -

To display the first question in this case study, click the Next button. Use the buttons in the left pane to explore the content of the case study before you answer the questions. Clicking these buttons displays information such as business requirements, existing environment, and problem statements. When you are ready to answer a question, click the Question button to return to the question.

Current environment -

Windows Server 2016 virtual machine

This virtual machine (VM) runs BizTalk Server 2016. The VM runs the following workflows:

Ocean Transport <sup>"</sup> This workflow gathers and validates container information including container contents and arrival notices at various shipping ports.

Inland Transport <sup>"</sup> This workflow gathers and validates trucking information including fuel usage, number of stops, and routes.

The VM supports the following REST API calls:

Container API <sup>"</sup> This API provides container information including weight, contents, and other attributes.

Location API <sup>"</sup> This API provides location information regarding shipping ports of call and trucking stops.

Shipping REST API <sup>"</sup> This API provides shipping information for use and display on the shipping website.

Shipping Data -

The application uses MongoDB JSON document storage database for all container and transport information.

Shipping Web Site -

The site displays shipping container tracking information and container contents. The site is located at <http://shipping.wideworldimporters.com/>

Proposed solution -

The on-premises shipping application must be moved to Azure. The VM has been migrated to a new Standard\_D16s\_v3 Azure VM by using Azure Site Recovery and must remain running in Azure to complete the BizTalk component migrations. You create a Standard\_D16s\_v3 Azure VM to host BizTalk Server. The Azure architecture diagram for the proposed solution is shown below:



---

Requirements -

Shipping Logic app -

The Shipping Logic app must meet the following requirements:

Support the ocean transport and inland transport workflows by using a Logic App.

Support industry-standard protocol X12 message format for various messages including vessel content details and arrival notices.

Secure resources to the corporate VNet and use dedicated storage resources with a fixed costing model.

Maintain on-premises connectivity to support legacy applications and final BizTalk migrations.

Shipping Function app -

Implement secure function endpoints by using app-level security and include Azure Active Directory (Azure AD).

REST APIs -

The REST API's that support the solution must meet the following requirements:

Secure resources to the corporate VNet.

Allow deployment to a testing location within Azure while not incurring additional costs.

Automatically scale to double capacity during peak shipping times while not causing application downtime.

Minimize costs when selecting an Azure payment model.

Shipping data -

Data migration from on-premises to Azure must minimize costs and downtime.

Shipping website -

Use Azure Content Delivery Network (CDN) and ensure maximum performance for dynamic content while minimizing latency and costs.

Issues -

Windows Server 2016 VM -

The VM shows high network latency, jitter, and high CPU utilization. The VM is critical and has not been backed up in the past. The VM must enable a quick restore from a 7-day snapshot to include in-place restore of disks in case of failure.

Shipping website and REST APIs -

The following error message displays while you are testing the website:

Failed to load <http://test-shippingapi.wideworldimporters.com/>: No 'Access-Control-Allow-Origin' header is present on the requested resource. Origin 'http://test.wideworldimporters.com/' is therefore not allowed access.

**Question**

HOTSPOT -

You need to configure Azure CDN for the Shipping web site.

Which configuration options should you use? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.

Hot Area:

**Answer Area**

Option	Value
Tier	<div style="border: 1px solid black; padding: 5px; display: inline-block;"><input type="checkbox"/> Standard <input type="checkbox"/> Premium</div>
Profile	<div style="border: 1px solid black; padding: 5px; display: inline-block;"><input type="checkbox"/> Akamai <input type="checkbox"/> Microsoft</div>
Optimization	<div style="border: 1px solid black; padding: 5px; display: inline-block;"><input type="checkbox"/> general web delivery <input type="checkbox"/> large file download <input type="checkbox"/> dynamic site acceleration <input type="checkbox"/> video-on-demand media streaming</div>

**Introductory Info****Case study -**

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**To start the case study -**

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**Current environment -****Windows Server 2016 virtual machine**

This virtual machine (VM) runs BizTalk Server 2016. The VM runs the following workflows:

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Inland Transport ~ This workflow gathers and validates trucking information including fuel usage, number of stops, and routes.

The VM supports the following REST API calls:

Container API ~ This API provides container information including weight, contents, and other attributes.

Location API ~ This API provides location information regarding shipping ports of call and trucking stops.

Shipping REST API ~ This API provides shipping information for use and display on the shipping website.

**Shipping Data -**

The application uses MongoDB JSON document storage database for all container and transport information.

**Shipping Web Site -**

The site displays shipping container tracking information and container contents. The site is located at <http://shipping.wideworldimporters.com/>

**Proposed solution -**

The on-premises shipping application must be moved to Azure. The VM has been migrated to a new Standard\_D16s\_v3 Azure VM by using Azure Site Recovery and must remain running in Azure to complete the BizTalk component migrations. You create a Standard\_D16s\_v3 Azure VM to host BizTalk Server. The Azure architecture diagram for the proposed solution is shown below:

Requirements -

Shipping Logic app -

The Shipping Logic app must meet the following requirements:

Support the ocean transport and inland transport workflows by using a Logic App.

Support industry-standard protocol X12 message format for various messages including vessel content details and arrival notices.

Secure resources to the corporate VNet and use dedicated storage resources with a fixed costing model.

Maintain on-premises connectivity to support legacy applications and final BizTalk migrations.

Shipping Function app -

Implement secure function endpoints by using app-level security and include Azure Active Directory (Azure AD).

REST APIs -

The REST API's that support the solution must meet the following requirements:

Secure resources to the corporate VNet.

Allow deployment to a testing location within Azure while not incurring additional costs.

Automatically scale to double capacity during peak shipping times while not causing application downtime.

Minimize costs when selecting an Azure payment model.

Shipping data -

Data migration from on-premises to Azure must minimize costs and downtime.

Shipping website -

Use Azure Content Delivery Network (CDN) and ensure maximum performance for dynamic content while minimizing latency and costs.

Issues -

Windows Server 2016 VM -

The VM shows high network latency, jitter, and high CPU utilization. The VM is critical and has not been backed up in the past. The VM must enable a quick restore from a 7-day snapshot to include in-place restore of disks in case of failure.

Shipping website and REST APIs -

The following error message displays while you are testing the website:

Failed to load <http://test-shippingapi.wideworldimporters.com/>: No 'Access-Control-Allow-Origin' header is present on the requested resource. Origin 'http://test.wideworldimporters.com/' is therefore not allowed access.

**Question**

HOTSPOT -

You need to correct the VM issues.

Which tools should you use? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.

Hot Area:

**Answer Area**

Issue	Tool
Backup and Restore	Azure Site Recovery Azure Backup Azure Data Box Azure Migrate
Performance	Azure Network Watcher Azure Traffic Manager ExpressRoute Accelerated Networking

## Topic 8

**Introductory Info****Case study -**

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**To start the case study -**

To display the first question in this case study, click the Next button. Use the buttons in the left pane to explore the content of the case study before you answer the questions. Clicking these buttons displays information such as business requirements, existing environment, and problem statements. When you are ready to answer a question, click the Question button to return to the question.

**Background -****Overview -**

You are a developer for Contoso, Ltd. The company has a social networking website that is developed as a Single Page Application (SPA). The main web application for the social networking website loads user uploaded content from blob storage.

You are developing a solution to monitor uploaded data for inappropriate content. The following process occurs when users upload content by using the SPA:

\* Messages are sent to ContentUploadService.

\* Content is processed by ContentAnalysisService.

\* After processing is complete, the content is posted to the social network or a rejection message is posted in its place.

The ContentAnalysisService is deployed with Azure Container Instances from a private Azure Container Registry named contosoimages.

The solution will use eight CPU cores.

**Azure Active Directory -**

Contoso, Ltd. uses Azure Active Directory (Azure AD) for both internal and guest accounts.

**Requirements -****ContentAnalysisService -**

The company's data science group built ContentAnalysisService which accepts user generated content as a string and returns a probable value for inappropriate content.

Any values over a specific threshold must be reviewed by an employee of Contoso, Ltd.

You must create an Azure Function named CheckUserContent to perform the content checks.

**Costs -**

You must minimize costs for all Azure services.

**Manual review -**

To review content, the user must authenticate to the website portion of the ContentAnalysisService using their Azure AD credentials. The website is built using React and all pages and API endpoints require authentication. In order to review content a user must be part of a ContentReviewer role. All completed reviews must include the reviewer's email address for auditing purposes.

**High availability -**

All services must run in multiple regions. The failure of any service in a region must not impact overall application availability.

**Monitoring -**

An alert must be raised if the ContentUploadService uses more than 80 percent of available CPU cores.

**Security -**

You have the following security requirements:

Any web service accessible over the Internet must be protected from cross site scripting attacks.

All websites and services must use SSL from a valid root certificate authority.

Azure Storage access keys must only be stored in memory and must be available only to the service.

All Internal services must only be accessible from internal Virtual Networks (VNets).

All parts of the system must support inbound and outbound traffic restrictions.

All service calls must be authenticated by using Azure AD.

**User agreements -**

When a user submits content, they must agree to a user agreement. The agreement allows employees of Contoso, Ltd. to review content, store cookies on user devices, and track user's IP addresses.

Information regarding agreements is used by multiple divisions within Contoso, Ltd.

User responses must not be lost and must be available to all parties regardless of individual service uptime. The volume of agreements is expected to be in the millions per hour.

Validation testing -

When a new version of the ContentAnalysisService is available the previous seven days of content must be processed with the new version to verify that the new version does not significantly deviate from the old version.

Issues -

Users of the ContentUploadService report that they occasionally see HTTP 502 responses on specific pages.

Code -

```
ContentUploadService -  
CS01 apiVersion: '2018-10-01'  
CS02 type: Microsoft.ContainerInstance/containerGroups  
CS03 location: westus  
CS04 name: contentUploadService  
CS05 properties:  
CS06     containers:  
CS07       - name: service  
CS08         properties:  
CS09           image: contoso/contentUploadService:latest  
CS10         ports:  
CS11           - port: 80  
CS12             protocol: TCP  
CS13         resources:  
CS14           requests:  
CS15             cpu: 1.0  
CS16             memoryInGB: 1.5  
CS17  
CS18 ipAddress:  
CS19   ip: 10.23.121.112  
CS20   ports:  
CS21     - port: 80  
CS22       protocol: TCP  
CS23  
CS24  
CS25 networkProfile:  
CS26  
id: /subscriptions/98...19/resourceGroups/container/providers/Microsoft.Network/networkProfiles/subnet
```

ApplicationManifest -

```
AM01 {  
AM02   "id" : "2b079f03-9b06-2d44-98bb-e9182901fc6",  
AM03   "appId" : "7118a7f0-b5c2-4c9d-833c-3d711396fe65",  
AM04  
AM05   "createdDateTime" : "2019-12-24T06:01:44Z",  
AM06   "logoUrl" : null,  
AM07   "logoutUrl" : null,  
AM08   "name" : "ContentAnalysisService",  
AM09  
AM10  
AM11   "orgRestrictions" : [],  
AM12   "parentalControlSettings" : {  
AM13     "countriesBlockedForMinors" : [],  
AM14       "legalAgeGroupRule" : "Allow"  
AM15     },  
AM16   "passwordCredentials" : []  
AM17 }
```

Question

DRAG DROP -

You need to add markup at line AM04 to implement the ContentReview role.

How should you complete the markup? To answer, drag the appropriate json segments to the correct locations. Each json segment 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.

NOTE: Each correct selection is worth one point.

Select and Place:

**Json segments**

**Answer Area**

User

"appRoles": [

{

value

  "": [

role

  "": "

],

Application

  "displayName": "ContentReviewer",

allowedMemberTypes

  "id": "e1c2ade8-98f8-45fd-aa4a-6d24b512c22a",

allowedAccountTypes

  "isEnabled" : true,

  "": "ContentReviewer"

}

,

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- \* Content is processed by ContentAnalysisService.
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The solution will use eight CPU cores.

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Requirements -

ContentAnalysisService -

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You must create an Azure Function named CheckUserContent to perform the content checks.

Costs -

You must minimize costs for all Azure services.

Manual review -

To review content, the user must authenticate to the website portion of the ContentAnalysisService using their Azure AD credentials. The website is built using React and all pages and API endpoints require authentication. In order to review content a user must be part of a ContentReviewer role. All completed reviews must include the reviewer's email address for auditing purposes.

High availability -

All services must run in multiple regions. The failure of any service in a region must not impact overall application availability.

Monitoring -

An alert must be raised if the ContentUploadService uses more than 80 percent of available CPU cores.

**Security -**

You have the following security requirements:

- Any web service accessible over the Internet must be protected from cross site scripting attacks.
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**Validation testing -**

When a new version of the ContentAnalysisService is available the previous seven days of content must be processed with the new version to verify that the new version does not significantly deviate from the old version.

**Issues -**

Users of the ContentUploadService report that they occasionally see HTTP 502 responses on specific pages.

Code -

```
ContentUploadService -  
CS01 apiVersion: '2018-10-01'  
CS02 type: Microsoft.ContainerInstance/containerGroups  
CS03 location: westus  
CS04 name: contentUploadService  
CS05 properties:  
CS06   containers:  
CS07     - name: service  
CS08       properties:  
CS09         image: contoso/contentUploadService:latest  
CS10       ports:  
CS11         - port: 80  
CS12           protocol: TCP  
CS13       resources:  
CS14         requests:  
CS15           cpu: 1.0  
CS16           memoryInGB: 1.5  
CS17  
CS18 ipAddress:  
CS19   ip: 10.23.121.112  
CS20   ports:  
CS21     - port: 80  
CS22       protocol: TCP  
CS23  
CS24  
CS25 networkProfile:  
CS26  
id: /subscriptions/98...19/resourceGroups/container/providers/Microsoft.Network/networkProfiles/subnet
```

ApplicationManifest -

```
AM01 {  
AM02   "id" : "2b079f03-9b06-2d44-98bb-e9182901fcb6",  
AM03   "appId" : "7118a7f0-b5c2-4c9d-833c-3d711396fe65",  
AM04  
AM05   "createdDateTime" : "2019-12-24T06:01:44Z",  
AM06   "logoUrl" : null,  
AM07   "logoutUrl" : null,  
AM08   "name" : "ContentAnalysisService",  
AM09  
AM10  
AM11   "orgRestrictions" : [],  
AM12   "parentalControlSettings" : {  
AM13     "countriesBlockedForMinors" : [],  
AM14       "legalAgeGroupRule" : "Allow"  
AM15     },  
AM16   "passwordCredentials" : []  
AM17 }
```

Question

HOTSPOT -

You need to add code at line AM09 to ensure that users can review content using ContentAnalysisService.

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

NOTE: Each correct selection is worth one point.

Hot Area:

## Answer Area

```
"allowPublicClient":true  
"oauth2Permissions": ["login"]  
"oauth2AllowUrlPathMatching":true  
"oauth2AllowIdTokenImplicitFlow":true
```

```
"oauth2AllowImplicitFlow": true  
"oauth2RequiredPostResponse":true  
"preAuthorizedApplications":["SPA"]  
"knownClientApplications":["ContentAnalysisService"]
```

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#### Security -

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#### Code -

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```
CS01 apiVersion: '2018-10-01'
CS02 type: Microsoft.ContainerInstance/containerGroups
CS03 location: westus
CS04 name: contentUploadService
CS05 properties:
CS06   containers:
CS07     - name: service
CS08       properties:
CS09         image: contoso/contentUploadService:latest
CS10       ports:
CS11         - port: 80
CS12           protocol: TCP
CS13       resources:
CS14         requests:
CS15           cpu: 1.0
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CS17
CS18 ipAddress:
CS19   ip: 10.23.121.112
CS20   ports:
CS21     - port: 80
CS22     protocol: TCP
CS23
CS24
CS25 networkProfile:
CS26
id: /subscriptions/98...19/resourceGroups/container/providers/Microsoft.Network/networkProfiles/subnet
```

```
ApplicationManifest -  
AM01 {  
AM02     "id" : "2b079f03-9b06-2d44-98bb-e9182901fcb6",  
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AM04  
AM05     "createdDateTime" : "2019-12-24T06:01:44Z",  
AM06     "logoUrl" : null,  
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AM09  
AM10  
AM11     "orgRestrictions" : [],  
AM12     "parentalControlSettings" : {  
AM13         "countriesBlockedForMinors" : [],  
AM14         "legalAgeGroupRule" : "Allow"  
AM15     },  
AM16     "passwordCredentials" : []  
AM17 }
```

**Question**

HOTSPOT -

You need to ensure that network security policies are met.

How should you configure network security? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.

Hot Area:

### Answer Area

Technology	Value
SSL certificate	<input type="checkbox"/> Valid root certificate <input type="checkbox"/> Self-signed certificate
Proxy type	<input type="checkbox"/> nginx <input type="checkbox"/> Azure Application Gateway

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Monitoring -

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#### Issues -

Users of the ContentUploadService report that they occasionally see HTTP 502 responses on specific pages.

#### Code -

##### ContentUploadService -

```
CS01 apiVersion: '2018-10-01'
CS02 type: Microsoft.ContainerInstance/containerGroups
CS03 location: westus
CS04 name: contentUploadService
CS05 properties:
CS06   containers:
CS07     - name: service
CS08       properties:
CS09         image: contoso/contentUploadService:latest
CS10       ports:
CS11         - port: 80
CS12           protocol: TCP
CS13       resources:
CS14         requests:
CS15           cpu: 1.0
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CS17
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```

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AM09  
AM10  
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AM12     "parentalControlSettings" : {  
AM13         "countriesBlockedForMinors" : [],  
AM14         "legalAgeGroupRule" : "Allow"  
AM15     },  
AM16     "passwordCredentials" : []  
AM17 }
```

**Question**

DRAG DROP -

You need to add YAML markup at line CS17 to ensure that the ContentUploadService can access Azure Storage access keys.

How should you complete the YAML markup? To answer, drag the appropriate YAML segments to the correct locations. Each YAML segment 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.

NOTE: Each correct selection is worth one point.

Select and Place:

**YAML segments**

- secret
- envVar
- secretValues
- volumes
- volumeMounts
- environmentVariables

**Answer Area**

YAML segment :  
- mountPath: /mnt/secrets  
 name: accesskey  
YAML segment :  
- name: accesskey  
YAML segment :  
key: TXkgZmlyc3Qgc2VjcmV0IEZPTwo=

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```
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CS02 type: Microsoft.ContainerInstance/containerGroups
CS03 location: westus
CS04 name: contentUploadService
CS05 properties:
CS06   containers:
CS07     - name: service
CS08       properties:
CS09         image: contoso/contentUploadService:latest
CS10       ports:
CS11         - port: 80
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```

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```
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AM09  
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AM12     "parentalControlSettings" : {  
AM13         "countriesBlockedForMinors" : [],  
AM14         "legalAgeGroupRule" : "Allow"  
AM15     },  
AM16     "passwordCredentials" : []  
AM17 }
```

**Question**

HOTSPOT -

You need to add code at line AM10 of the application manifest to ensure that the requirement for manually reviewing content can be met.

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

NOTE: Each correct selection is worth one point.

Hot Area:

**Answer Area**

```
    "optionalClaims": [  
        "acct",  
        "platf",  
        "sid",  
        "tenant_ctry",  
        "sid",  
        "upn",  
        "email",  
        "enfpolids"],
```

## Topic 9

### Question #1

### Topic 9

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##### Current environment -

###### Windows Server 2016 virtual machine

This virtual machine (VM) runs BizTalk Server 2016. The VM runs the following workflows:

Ocean Transport " This workflow gathers and validates container information including container contents and arrival notices at various shipping ports.

Inland Transport " This workflow gathers and validates trucking information including fuel usage, number of stops, and routes.

The VM supports the following REST API calls:

Container API " This API provides container information including weight, contents, and other attributes.

Location API " This API provides location information regarding shipping ports of call and trucking stops.

Shipping REST API " This API provides shipping information for use and display on the shipping website.

##### Shipping Data -

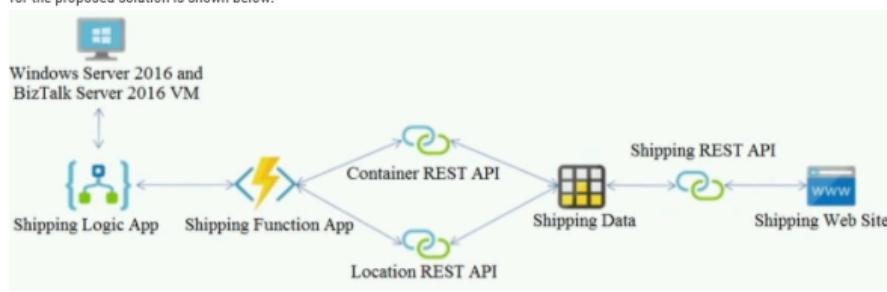
The application uses MongoDB JSON document storage database for all container and transport information.

##### Shipping Web Site -

The site displays shipping container tracking information and container contents. The site is located at <http://shipping.wideworldimporters.com/>

##### Proposed solution -

The on-premises shipping application must be moved to Azure. The VM has been migrated to a new Standard\_D16s\_v3 Azure VM by using Azure Site Recovery and must remain running in Azure to complete the BizTalk component migrations. You create a Standard\_D16s\_v3 Azure VM to host BizTalk Server. The Azure architecture diagram for the proposed solution is shown below:



**Requirements -**

**Shipping Logic app -**

The Shipping Logic app must meet the following requirements:

Support the ocean transport and inland transport workflows by using a Logic App.

Support industry-standard protocol X12 message format for various messages including vessel content details and arrival notices.

Secure resources to the corporate VNet and use dedicated storage resources with a fixed costing model.

Maintain on-premises connectivity to support legacy applications and final BizTalk migrations.

**Shipping Function app -**

Implement secure function endpoints by using app-level security and include Azure Active Directory (Azure AD).

**REST APIs -**

The REST API's that support the solution must meet the following requirements:

Secure resources to the corporate VNet.

Allow deployment to a testing location within Azure while not incurring additional costs.

Automatically scale to double capacity during peak shipping times while not causing application downtime.

Minimize costs when selecting an Azure payment model.

**Shipping data -**

Data migration from on-premises to Azure must minimize costs and downtime.

**Shipping website -**

Use Azure Content Delivery Network (CDN) and ensure maximum performance for dynamic content while minimizing latency and costs.

**Issues -**

**Windows Server 2016 VM -**

The VM shows high network latency, jitter, and high CPU utilization. The VM is critical and has not been backed up in the past. The VM must enable a quick restore from a 7-day snapshot to include in-place restore of disks in case of failure.

**Shipping website and REST APIs -**

The following error message displays while you are testing the website:

Failed to load <http://test-shippingapi.wideworldimporters.com/>: No 'Access-Control-Allow-Origin' header is present on the requested resource. Origin '<http://test.wideworldimporters.com/>' is therefore not allowed access.

**Question**

HOTSPOT -

You need to secure the Shipping Function app.

How should you configure the app? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.

Hot Area:

**Answer Area****Setting**      **Value**

Authorization level

Function
Anonymous
Admin

User claims

JSON Web Token (JWT)
Shared Access Signature (SAS) token
API Key

Trigger type

blob
HTTP
queue
timer

**Introductory Info**

Case study -

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Current environment -

Windows Server 2016 virtual machine

This virtual machine (VM) runs BizTalk Server 2016. The VM runs the following workflows:

Ocean Transport ^ This workflow gathers and validates container information including container contents and arrival notices at various shipping ports.

Inland Transport ^ This workflow gathers and validates trucking information including fuel usage, number of stops, and routes.

The VM supports the following REST API calls:

Container API ^ This API provides container information including weight, contents, and other attributes.

Location API ^ This API provides location information regarding shipping ports of call and trucking stops.

Shipping REST API ^ This API provides shipping information for use and display on the shipping website.

Shipping Data -

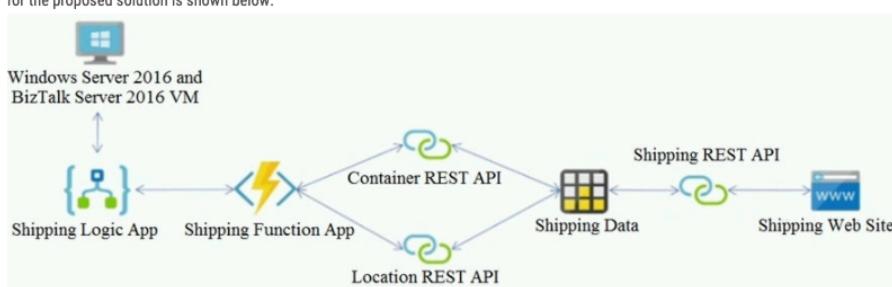
The application uses MongoDB JSON document storage database for all container and transport information.

Shipping Web Site -

The site displays shipping container tracking information and container contents. The site is located at <http://shipping.wideworldimporters.com/>

Proposed solution -

The on-premises shipping application must be moved to Azure. The VM has been migrated to a new Standard\_D16s\_v3 Azure VM by using Azure Site Recovery and must remain running in Azure to complete the BizTalk component migrations. You create a Standard\_D16s\_v3 Azure VM to host BizTalk Server. The Azure architecture diagram for the proposed solution is shown below:



Requirements -

Shipping Logic app -

The Shipping Logic app must meet the following requirements:

Support the ocean transport and inland transport workflows by using a Logic App.

Support industry-standard protocol X12 message format for various messages including vessel content details and arrival notices.

Secure resources to the corporate VNet and use dedicated storage resources with a fixed costing model.

Maintain on-premises connectivity to support legacy applications and final BizTalk migrations.

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Implement secure function endpoints by using app-level security and include Azure Active Directory (Azure AD).

REST APIs -

The REST API's that support the solution must meet the following requirements:

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Minimize costs when selecting an Azure payment model.

**Shipping data -**

Data migration from on-premises to Azure must minimize costs and downtime.

**Shipping website -**

Use Azure Content Delivery Network (CDN) and ensure maximum performance for dynamic content while minimizing latency and costs.

**Issues -**

**Windows Server 2016 VM -**

The VM shows high network latency, jitter, and high CPU utilization. The VM is critical and has not been backed up in the past. The VM must enable a quick restore from a 7-day snapshot to include in-place restore of disks in case of failure.

**Shipping website and REST APIs -**

The following error message displays while you are testing the website:

Failed to load <http://test-shippingapi.wideworldimporters.com/>: No 'Access-Control-Allow-Origin' header is present on the requested resource. Origin '<http://test.wideworldimporters.com/>' is therefore not allowed access.

**Question**

You need to secure the Shipping Logic App.

What should you use?

- A. Azure App Service Environment (ASE)
- B. Integration Service Environment (ISE)
- C. VNet service endpoint
- D. Azure AD B2B integration

## Topic 10

### Question #1

### Topic 10

#### Introductory Info

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Background -

City Power & Light company provides electrical infrastructure monitoring solutions for homes and businesses. The company is migrating solutions to Azure.

Current environment -

Architecture overview -

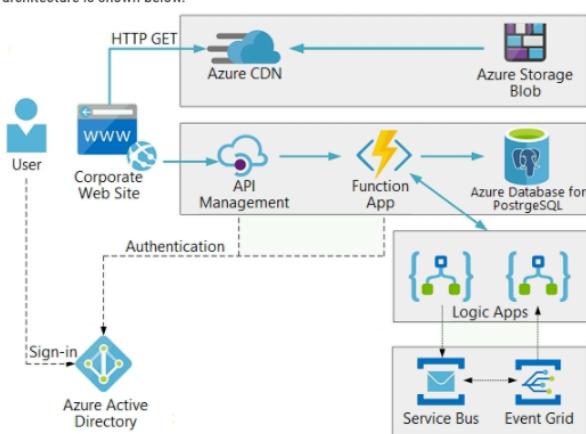
The company has a public website located at <http://www.cpandi.com/>. The site is a single-page web application that runs in Azure App Service on Linux. The website uses files stored in Azure Storage and cached in Azure Content Delivery Network (CDN) to serve static content.

API Management and Azure Function App functions are used to process and store data in Azure Database for PostgreSQL. API Management is used to broker communications to the Azure Function app functions for Logic app integration. Logic apps are used to orchestrate the data processing while Service Bus and Event Grid handle messaging and events.

The solution uses Application Insights, Azure Monitor, and Azure Key Vault.

Architecture diagram -

The company has several applications and services that support their business. The company plans to implement serverless computing where possible. The overall architecture is shown below.



User authentication -

The following steps detail the user authentication process:

1. The user selects Sign in in the website.
2. The browser redirects the user to the Azure Active Directory (Azure AD) sign in page.
3. The user signs in.
4. Azure AD redirects the user's session back to the web application. The URL includes an access token.
5. The web application calls an API and includes the access token in the authentication header. The application ID is sent as the audience ('aud') claim in the access token.
6. The back-end API validates the access token.

Requirements -

Corporate website -

Communications and content must be secured by using SSL.

Communications must use HTTPS.

Data must be replicated to a secondary region and three availability zones.

Data storage costs must be minimized.

Azure Database for PostgreSQL -

The database connection string is stored in Azure Key Vault with the following attributes:

Azure Key Vault name: cpandlkeyvault

Secret name: PostgreSQLConn

Id: 80df3e46ffcd4f1cb187f79905e9a1e8

The connection information is updated frequently. The application must always use the latest information to connect to the database.

Azure Service Bus and Azure Event Grid

Azure Event Grid must use Azure Service Bus for queue-based load leveling.

Events in Azure Event Grid must be routed directly to Service Bus queues for use in buffering.

Events from Azure Service Bus and other Azure services must continue to be routed to Azure Event Grid for processing.

Security -

All SSL certificates and credentials must be stored in Azure Key Vault.

File access must restrict access by IP, protocol, and Azure AD rights.

All user accounts and processes must receive only those privileges which are essential to perform their intended function.

Compliance -

Auditing of the file updates and transfers must be enabled to comply with General Data Protection Regulation (GDPR). The file updates must be read-only, stored in the order in which they occurred, include only create, update, delete, and copy operations, and be retained for compliance reasons.

Issues -

Corporate website -

While testing the site, the following error message displays:

CryptographicException: The system cannot find the file specified.

Function app -

You perform local testing for the RequestUserApproval function. The following error message displays:

'Timeout value of 00:10:00 exceeded by function: RequestUserApproval'

The same error message displays when you test the function in an Azure development environment when you run the following Kusto query:

FunctionAppLogs -

| where FunctionName == "RequestUserApproval"

Logic app -

You test the Logic app in a development environment. The following error message displays:

'400 Bad Request'

Troubleshooting of the error shows an HttpTrigger action to call the RequestUserApproval function.

Code -

Corporate website -

Security.cs:

```
SC01 public class Security
SC02 {
SC03     var bytes = System.IO.File.ReadAllBytes("~/var/ssl/private");
SC04     var cert = new System.Security.Cryptography.X509Certificate2(bytes);
SC05     var certName = cert.FriendlyName;
SC06 }
```

Function app -

RequestUserApproval.cs:

```
RA01 public static class RequestUserApproval
RA02 {
RA03     [FunctionName("RequestUserApproval")]
RA04     public static async Task<IActionResult> Run(
RA05         [HttpTrigger(AuthorizationLevel.Function, "get", "post", Route = null)] HttpRequest req,
RA06         ILogger log)
RA07     {
RA08         log.LogInformation("RequestUserApproval function processed a request.");
RA09         ...
RA10         return ProcessRequest(req)
RA11     ? (ActionResult)new OkObjectResult($"User approval processed")
RA12     : new BadRequestObjectResult("Failed to process user approval");
RA13     private static bool ProcessRequest(HttpContext req)
RA14     {
RA15         ...
RA16     }
RA17 }
```

#### Question

HOTSPOT -

You need to retrieve the database connection string.

Which values should you use? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.

Hot Area:

#### Question

HOTSPOT -

You need to retrieve the database connection string.

Which values should you use? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.

Hot Area:

#### Answer Area

REST API Endpoint:

https://	<input type="text" value="cpandlkeyvault"/>	... vault.azure.net/secrets/	<input type="text" value="cpandlkeyvault"/>	/
	<input type="checkbox" value="PostgreSQLConn"/>		<input type="checkbox" value="PostgreSQLConn"/>	
	<input type="checkbox" value="80df3e46ffcd4f1cb187f79905e9a1e8"/>		<input type="checkbox" value="80df3e46ffcd4f1cb187f79905e9a1e8"/>	

Variable type to access Azure Key Vault secret values:

<input type="radio" value="Environment"/>
<input type="radio" value="Session"/>
<input type="radio" value="ViewState"/>
<input type="radio" value="QueryString"/>

**Introductory Info**

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Background -

City Power & Light company provides electrical infrastructure monitoring solutions for homes and businesses. The company is migrating solutions to Azure.

Current environment -

Architecture overview -

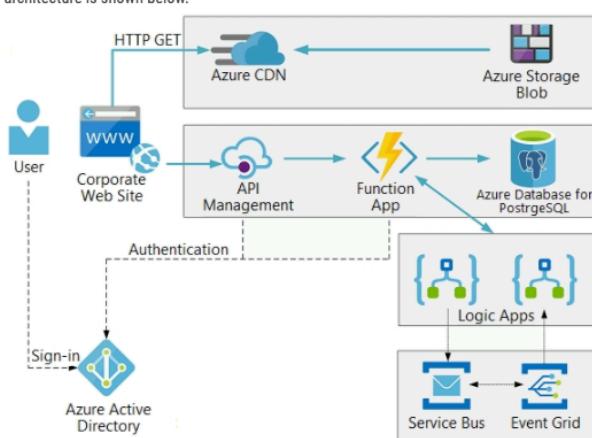
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The solution uses Application Insights, Azure Monitor, and Azure Key Vault.

Architecture diagram -

The company has several applications and services that support their business. The company plans to implement serverless computing where possible. The overall architecture is shown below.



User authentication -

The following steps detail the user authentication process:

1. The user selects Sign in in the website.
2. The browser redirects the user to the Azure Active Directory (Azure AD) sign in page.
3. The user signs in.
4. Azure AD redirects the user's session back to the web application. The URL includes an access token.
5. The web application calls an API and includes the access token in the authentication header. The application ID is sent as the audience ('aud') claim in the access token.
6. The back-end API validates the access token.

Requirements -

Corporate website -

Communications and content must be secured by using SSL.

Communications must use HTTPS.

Data must be replicated to a secondary region and three availability zones.

Data storage costs must be minimized.

Azure Database for PostgreSQL -

The database connection string is stored in Azure Key Vault with the following attributes:

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- Secret name: PostgreSQLConn
- Id: 80df3e46fcfd4f1cb187f79905e9a1e8

The connection information is updated frequently. The application must always use the latest information to connect to the database.

Azure Service Bus and Azure Event Grid

- Azure Event Grid must use Azure Service Bus for queue-based load leveling.
- Events in Azure Event Grid must be routed directly to Service Bus queues for use in buffering.
- Events from Azure Service Bus and other Azure services must continue to be routed to Azure Event Grid for processing.

**Security -**

- All SSL certificates and credentials must be stored in Azure Key Vault.
- File access must restrict access by IP, protocol, and Azure AD rights.
- All user accounts and processes must receive only those privileges which are essential to perform their intended function.

**Compliance -**

Auditing of the file updates and transfers must be enabled to comply with General Data Protection Regulation (GDPR). The file updates must be read-only, stored in the order in which they occurred, include only create, update, delete, and copy operations, and be retained for compliance reasons.

**Issues -**

**Corporate website -**

While testing the site, the following error message displays:

CryptographicException: The system cannot find the file specified.

**Function app -**

You perform local testing for the RequestUserApproval function. The following error message displays:

'Timeout value of 00:10:00 exceeded by function: RequestUserApproval'

The same error message displays when you test the function in an Azure development environment when you run the following Kusto query:

```
FunctionAppLogs
| where FunctionName == "RequestUserApproval"
```

**Logic app -**

You test the Logic app in a development environment. The following error message displays:

'400 Bad Request'

Troubleshooting of the error shows an HttpTrigger action to call the RequestUserApproval function.

**Code -**

**Corporate website -**

Security.cs:

```
SC01 public class Security
SC02 {
SC03 var bytes = System.IO.File.ReadAllBytes("~/var/ssl/private");
SC04 var cert = new System.Security.Cryptography.X509Certificate2(bytes);
SC05 var certName = cert.FriendlyName;
SC06 }
```

**Function app -**

RequestUserApproval.cs:

```
RA01 public static class RequestUserApproval
RA02 {
RA03 [FunctionName("RequestUserApproval")]
RA04 public static async Task<IActionResult> Run(
RA05 [HttpTrigger(AuthorizationLevel.Function, "get", "post", Route = null)] HttpRequest req,
ILogger log)
RA06 {
RA07     log.LogInformation("RequestUserApproval function processed a request.");
RA08 ...
RA09     return ProcessRequest(req)
RA10     ? (ActionResult)new OkObjectResult($"User approval processed")
RA11     : new BadRequestObjectResult("Failed to process user approval");
RA12 }
RA13 private static bool ProcessRequest(HttpContext req)
RA14 {
RA15     ...
RA16 }
RA17 }
```

**Question**

DRAG DROP -

You need to correct the corporate website error.

Which four actions should you recommend be performed in sequence? To answer, move the appropriate actions from the list of actions to the answer area and arrange them in the correct order.

Select and Place:

Actions	Answer Area
Upload the certificate to Azure Key Vault.	
Update line SC05 of Security.cs to include error handling and then redeploy the code.	>
Update line SC03 of Security.cs to include a using statement and then re-deploy the code.	<
Add the certificate thumbprint to the WEBSITE_LOAD_CERTIFICATES app setting.	^
Upload the certificate to source control.	▼
Import the certificate to Azure App Service.	
Generate a certificate.	

**Question #3***Topic 10***Introductory Info**

Case study -

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Background -

City Power &amp; Light company provides electrical infrastructure monitoring solutions for homes and businesses. The company is migrating solutions to Azure.

Current environment -

Architecture overview -

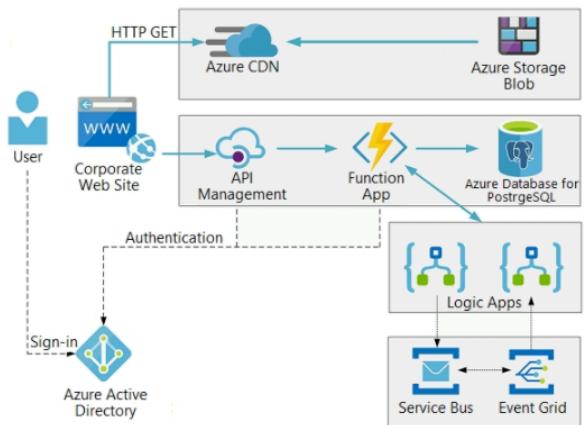
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Architecture diagram -

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#### User authentication -

The following steps detail the user authentication process:

1. The user selects Sign in in the website.
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4. Azure AD redirects the user's session back to the web application. The URL includes an access token.
5. The web application calls an API and includes the access token in the authentication header. The application ID is sent as the audience ("aud") claim in the access token.
6. The back-end API validates the access token.

#### Requirements -

##### Corporate website -

Communications and content must be secured by using SSL.

Communications must use HTTPS.

Data must be replicated to a secondary region and three availability zones.

Data storage costs must be minimized.

#### Azure Database for PostgreSQL -

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#### Compliance -

Auditing of the file updates and transfers must be enabled to comply with General Data Protection Regulation (GDPR). The file updates must be read-only, stored in the order in which they occurred, include only create, update, delete, and copy operations, and be retained for compliance reasons.

#### Issues -

##### Corporate website -

While testing the site, the following error message displays:

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##### Function app -

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##### Logic app -

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#### Code -

##### Corporate website -

Security.cs:

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##### Function app -

RequestUserApproval.cs:

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RA12 }
RA13 private static bool ProcessRequest(HttpContext req)
RA14 {
RA15     ...
RA16 }
RA17 }
```

## Question

HOTSPOT -

You need to configure API Management for authentication.

Which policy values should you use? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.

Hot Area:

## Answer Area

Setting	Value
Policy	<div style="border: 1px solid black; padding: 5px;"><p>Check HTTP header</p><p>Restrict caller IPs</p><p>Limit call rate by key</p><p>Validate JWT</p></div>
Policy section	<div style="border: 1px solid black; padding: 5px;"><p>Inbound</p><p>Outbound</p></div>

### Question #4

### Topic 10

#### Introductory Info

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Background -

City Power & Light company provides electrical infrastructure monitoring solutions for homes and businesses. The company is migrating solutions to Azure.

Current environment -

Architecture overview -

The company has a public website located at <http://www.cpndl.com/>. The site is a single-page web application that runs in Azure App Service on Linux. The website uses files stored in Azure Storage and cached in Azure Content Delivery Network (CDN) to serve static content.

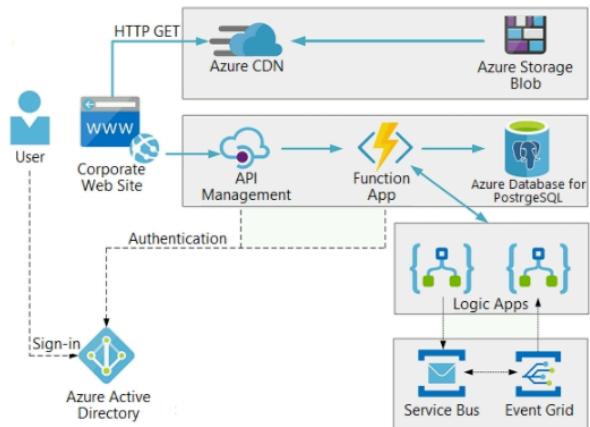
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Architecture diagram -

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3. The user signs in.
4. Azure AD redirects the user's session back to the web application. The URL includes an access token.
5. The web application calls an API and includes the access token in the authentication header. The application ID is sent as the audience ('`aud`') claim in the access token.
6. The back-end API validates the access token.

#### Requirements -

##### Corporate website -

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Communications must use HTTPS.

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The connection information is updated frequently. The application must always use the latest information to connect to the database.

Azure Service Bus and Azure Event Grid

Azure Event Grid must use Azure Service Bus for queue-based load leveling.

Events in Azure Event Grid must be routed directly to Service Bus queues for use in buffering.

Events from Azure Service Bus and other Azure services must continue to be routed to Azure Event Grid for processing.

Security -

All SSL certificates and credentials must be stored in Azure Key Vault.

File access must restrict access by IP, protocol, and Azure AD rights.

All user accounts and processes must receive only those privileges which are essential to perform their intended function.

Compliance -

Auditing of the file updates and transfers must be enabled to comply with General Data Protection Regulation (GDPR). The file updates must be read-only, stored in the order in which they occurred, include only create, update, delete, and copy operations, and be retained for compliance reasons.

Issues -

Corporate website -

While testing the site, the following error message displays:

CryptographicException: The system cannot find the file specified.

Function app -

You perform local testing for the RequestUserApproval function. The following error message displays:

'Timeout value of 00:10:00 exceeded by function: RequestUserApproval'

The same error message displays when you test the function in an Azure development environment when you run the following Kusto query:

FunctionAppLogs -

| where FunctionName == "RequestUserApproval"

Logic app -

You test the Logic app in a development environment. The following error message displays:

'400 Bad Request'

Troubleshooting of the error shows an HttpTrigger action to call the RequestUserApproval function.

Corporate website -

Security.cs:

```
SC01 public class Security
SC02 {
SC03     var bytes = System.IO.File.ReadAllBytes("~/var/ssl/private");
SC04     var cert = new System.Security.Cryptography.X509Certificate2(bytes);
SC05     var certName = cert.FriendlyName;
SC06 }
```

Function app -

RequestUserApproval.cs:

```
RA01 public static class RequestUserApproval
RA02 {
RA03     [FunctionName("RequestUserApproval")]
RA04     public static async Task<IActionResult> Run(
RA05         [HttpTrigger(AuthorizationLevel.Function, "get", "post", Route = null)] HttpRequest req,
RA06         ILogger log)
RA07     {
RA08         log.LogInformation("RequestUserApproval function processed a request.");
RA09     }
RA10     return ProcessRequest(req)
RA11     ? (ActionResult)new OkObjectResult($"User approval processed")
RA12     : new BadRequestObjectResult("Failed to process user approval");
RA13     private static bool ProcessRequest(HttpContext req)
RA14     {
RA15         ...
RA16     }
RA17 }
```

#### Question

You need to authenticate the user to the corporate website as indicated by the architectural diagram.

Which two values should you use? Each correct answer presents part of the solution.

NOTE: Each correct selection is worth one point.

- A. ID token signature
- B. ID token claims
- C. HTTP response code
- D. Azure AD endpoint URI
- E. Azure AD tenant ID

**Introductory Info**

Case study -

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Background -

City Power & Light company provides electrical infrastructure monitoring solutions for homes and businesses. The company is migrating solutions to Azure.

Current environment -

Architecture overview -

The company has a public website located at <http://www.cpndl.com/>. The site is a single-page web application that runs in Azure App Service on Linux. The website uses files stored in Azure Storage and cached in Azure Content Delivery Network (CDN) to serve static content.

API Management and Azure Function App functions are used to process and store data in Azure Database for PostgreSQL. API Management is used to broker communications to the Azure Function app functions for Logic app integration. Logic apps are used to orchestrate the data processing while Service Bus and Event Grid handle messaging and events.

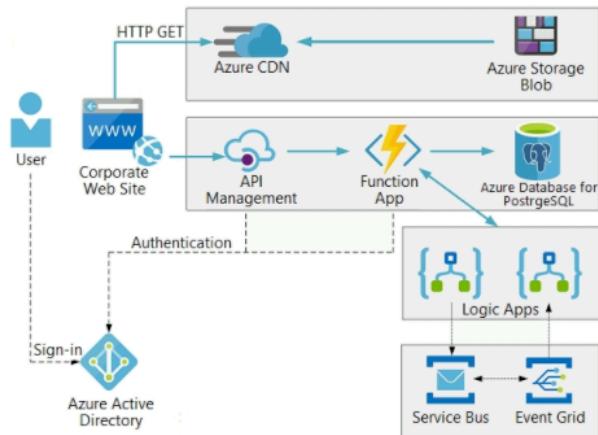
The solution uses Application Insights, Azure Monitor, and Azure Key Vault.

Architecture diagram -

The company has several applications and services that support their business. The company plans to implement serverless computing where possible. The overall architecture is shown below.

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User authentication -

The following steps detail the user authentication process:

1. The user selects Sign in in the website.
2. The browser redirects the user to the Azure Active Directory (Azure AD) sign in page.
3. The user signs in.
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5. The web application calls an API and includes the access token in the authentication header. The application ID is sent as the audience ('aud') claim in the access token.
6. The back-end API validates the access token.

Requirements -

Corporate website -

Communications and content must be secured by using SSL.

Communications must use HTTPS.

Data must be replicated to a secondary region and three availability zones.

Data storage costs must be minimized.

Azure Database for PostgreSQL -

The database connection string is stored in Azure Key Vault with the following attributes:

Azure Key Vault name: cpandlkeyvault

Secret name PostgreSQLConn

Id: 80df3e46ffcd4f1cb187f79905e9a1e8

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**Question**

HOTSPOT -

You need to correct the Azure Logic app error message.

Which configuration values should you use? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.

Hot Area:

**Answer Area**

<b>Setting</b>	<b>Value</b>
authentication level	<input type="checkbox"/> anonymous <input type="checkbox"/> function <input type="checkbox"/> admin
managed identity	<input type="checkbox"/> system-assigned <input type="checkbox"/> user-assigned

**Question #6****Topic 10****Introductory Info**

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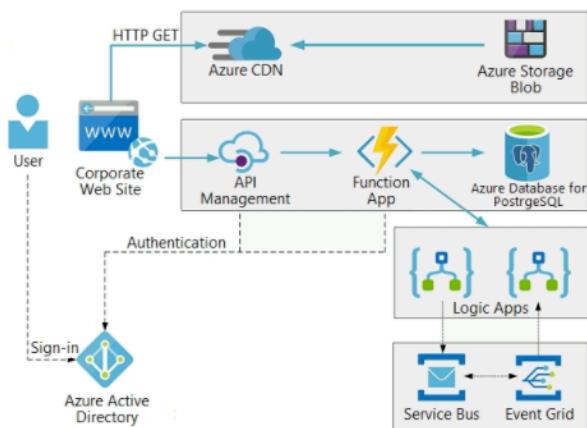
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RA05 [HttpTrigger(AuthorizationLevel.Function, "get", "post", Route = null)] HttpRequest req,
ILogger log)
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RA08 ...
RA09     return ProcessRequest(req)
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RA12 }
RA13 private static bool ProcessRequest(HttpContext req)
RA14 {
RA15     ...
RA16 }
RA17 }
```

**Question**

HOTSPOT -

You need to configure Azure Service Bus to Event Grid integration.

Which Azure Service Bus settings should you use? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.

Hot Area:

**Answer Area**

	<b>Setting</b>	<b>Value</b>
Tier		<input type="checkbox"/> Basic <input type="checkbox"/> Standard <input type="checkbox"/> Premium
RBAC role		<input type="checkbox"/> Owner <input type="checkbox"/> Contributor <input type="checkbox"/> Azure Service Bus Data Owner <input type="checkbox"/> Azure Service Bus Data Receiver

## Topic 11

**Question #1****Topic 11****Introductory Info**

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Background -

You are a developer for Litware Inc., a SaaS company that provides a solution for managing employee expenses. The solution consists of an ASP.NET Core Web API project that is deployed as an Azure Web App.

Overall architecture -

Employees upload receipts for the system to process. When processing is complete, the employee receives a summary report email that details the processing results. Employees then use a web application to manage their receipts and perform any additional tasks needed for reimbursement.

Receipt processing -

Employees may upload receipts in two ways:

Uploading using an Azure Files mounted folder

Uploading using the web application

Data Storage -

Receipt and employee information is stored in an Azure SQL database.

Documentation -

Employees are provided with a getting started document when they first use the solution. The documentation includes details on supported operating systems for Azure File upload, and instructions on how to configure the mounted folder.

Solution details -

Users table -

Column	Description
UserId	unique identifier for and employee
ExpenseAccount	employees expense account number in the format 1234-123-1234
AllowedAmount	limit of allowed expenses before approval is needed
SupervisorId	unique identifier for employee's supervisor
SecurityPin	value used to validate user identity

Web Application -

You enable MSI for the Web App and configure the Web App to use the security principal name WebAppIdentity.

Processing -

Processing is performed by an Azure Function that uses version 2 of the Azure Function runtime. Once processing is completed, results are stored in Azure Blob Storage and an Azure SQL database. Then, an email summary is sent to the user with a link to the processing report. The link to the report must remain valid if the email is forwarded to another user.

Logging -

Azure Application Insights is used for telemetry and logging in both the processor and the web application. The processor also has TraceWriter logging enabled. Application Insights must always contain all log messages.

Requirements -

Receipt processing -

Concurrent processing of a receipt must be prevented.

Disaster recovery -

Regional outage must not impact application availability. All DR operations must not be dependent on application running and must ensure that data in the DR region is up to date.

Security -

User's SecurityPin must be stored in such a way that access to the database does not allow the viewing of SecurityPins. The web application is the only system that should have access to SecurityPins.

All certificates and secrets used to secure data must be stored in Azure Key Vault.

You must adhere to the principle of least privilege and provide privileges which are essential to perform the intended function.

All access to Azure Storage and Azure SQL database must use the application's Managed Service Identity (MSI).

Receipt data must always be encrypted at rest.

All data must be protected in transit.

User's expense account number must be visible only to logged in users. All other views of the expense account number should include only the last segment, with the remaining parts obscured.

In the case of a security breach, access to all summary reports must be revoked without impacting other parts of the system.

Issues -

Upload format issue -

Employees occasionally report an issue with uploading a receipt using the web application. They report that when they upload a receipt using the Azure File Share, the receipt does not appear in their profile. When this occurs, they delete the file in the file share and use the web application, which returns a 500 Internal Server error page.

Capacity issue -

During busy periods, employees report long delays between the time they upload the receipt and when it appears in the web application.

Log capacity issue -

Developers report that the number of log messages in the trace output for the processor is too high, resulting in lost log messages.

Application code -

```
Processing.cs -
PC01 public static class Processing
PC02 {
PC03     public static class Function
PC04     {
PC05         [FunctionName("IssueWork")]
PC06         public static async Task Run([TimerTrigger("0 */5 * * *")] TimerInfo timer, ILogger
log)
PC07         {
PC08             var container = await GetCloudBlobContainer();
PC09             foreach (var fileItem in await ListFiles())
PC10             {
PC11                 var file = new CloudFile(fileItem.StorageUri.PrimaryUri);
PC12                 var ms = new MemoryStream();
PC13                 await file.DownloadToStreamAsync(ms);
PC14                 var blob = container.GetBlockBlobReference(fileItem.Uri.ToString());
PC15                 await blob.UploadFromStreamAsync(ms);
PC16             }
PC17         }
PC18     }
PC19     private static CloudBlockBlob GetDRBlockBlob(CloudBlockBlob sourceBlob)
PC20     {
PC21         . . .
PC22     }
PC23     private static async Task<CloudBlobContainer> GetCloudBlobContainer()
PC24     {
PC25         var cloudBlobClient = new CloudBlobClient(new Uri(" . . ."), await GetCredentials());
PC26
PC27         await cloudBlobClient.GetRootContainerReference().CreateIfNotExistsAsync();
PC28         return cloudBlobClient.GetRootContainerReference();
PC29     }
PC30     private static async Task<StorageCredentials> GetCredentials()
PC31     {
PC32         . . .
PC33     }
PC34     private static async Task<List<IListFileItem>> ListFiles()
PC35     {
PC36         . . .
PC37     }
PC37     private KeyVaultClient _keyVaultClient = new KeyVaultClient(" . . .");
PC38 }
PC39 }
```

```
Database.cs -  
DB01 public class Database  
DB02 {  
DB03     private string ConnectionString =  
DB04  
DB05     public async Task<object> LoadUserDetails(string userId)  
DB06     {  
DB07  
DB08         return await policy.ExecuteAsync(async () =>  
DB09         {  
DB10             using (var connection = new SqlConnection(ConnectionString))  
DB11             {  
DB12                 await connection.OpenAsync();  
DB13                 using (var command = new SqlCommand("...", connection))  
DB14                     using (var reader = command.ExecuteReader())  
DB15                     {  
DB16                         ...  
DB17                     }  
DB18                 }  
DB19             });  
DB20         }  
DB21     }  
DB22 }
```

ReceiptUploader.cs -

```
RU01 public class ReceiptUploader  
RU02 {  
RU03     public async Task UploadFile(string file, byte[] binary)  
RU04     {  
RU05         var httpClient = new HttpClient();  
RU06         var response = await httpClient.PutAsync("...", new ByteArrayContent(binary));  
RU07         while (ShouldRetry(response))  
RU08         {  
RU09             response = await httpClient.PutAsync("...", new ByteArrayContent(binary));  
RU10         }  
RU11     }  
RU12     private bool ShouldRetry(HttpStatusCode response)  
RU13     {  
RU14     }  
RU15     }  
RU16 }
```

ConfigureSSE.ps1 -

```
CS01 $storageAccount = Get-AzureRmStorageAccount -ResourceGroupName "..." -AccountName "..."
CS02 $keyVault = Get-AzureRmKeyVault -VaultName "..."
CS03 $key = Get-AzureKeyVaultKey -VaultName $keyVault.VaultName -Name "..."
CS04 Set-AzureRmKeyVaultAccessPolicy ` 
CS05 -VaultName $keyVault.VaultName ` 
CS06 -ObjectId $storageAccount.Identity.PrincipalId ` 
CS07 
CS08 
CS09 Set-AzureRmStorageAccount ` 
CS10 -ResourceGroupName $storageAccount.ResourceGroupName ` 
CS11 -AccountName $storageAccount.StorageAccountName ` 
CS12 -EnableEncryptionService File ` 
CS13 -KeyvaultEncryption ` 
CS14 -KeyName $key.Name 
CS15 -KeyVersion $key.Version ` 
CS16 -KeyVaultUri $keyVault.VaultUri
```

**Question**

HOTSPOT -

You need to add code at line PC26 of Processing.cs to ensure that security policies are met.

How should you complete the code that you will add at line PC26? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.

Hot Area:

**Answer Area**

```
var resolver = new KeyVaultKeyResolver(_keyVaultClient);
var keyBundle = await _keyVaultClient.GetKeyAsync("...", "...");
```

```
var key = keyBundle.Key;
var key = keyBundle.KeyIdentifier.Identifier;
var key = await resolver.ResolveKeyAsync("encrypt", null);
var key = await resolver.ResolveKeyAsync(keyBundle.KeyIdentifier.Identifier, CancellationToken.None);
```

```
var x = keyBundle.Managed;
var x = AuthenticationScheme.SharedKey;
var x = new BlobEncryptionPolicy(key, resolver);
var x = new DeleteRetentionPolicy {Enabled = key.Kid != null};
```

```
cloudBlobClient.AuthenticationScheme = x;
cloudBlobClient.DefaultRequestOptions.RequireEncryption = x;
cloudBlobClient.DefaultRequestOptions.EncryptionPolicy = x;
cloudBlobClient.SetServiceProperties(new ServiceProperties(deleteRetentionPolicy:x));
```

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PC03     public static class Function  
PC04     {  
PC05         [FunctionName("IssueWork")]  
PC06         public static async Task Run([TimerTrigger("0 */5 * * *")] TimerInfo timer, ILogger  
log)  
PC07         {  
PC08             var container = await GetCloudBlobContainer();  
PC09             foreach (var fileItem in await ListFiles())  
PC10             {  
PC11                 var file = new CloudFile(fileItem.StorageUri.PrimaryUri);  
PC12                 var ms = new MemoryStream();  
PC13                 await file.DownloadToStreamAsync(ms);  
PC14                 var blob = container.GetBlockBlobReference(fileItem.Uri.ToString());  
PC15                 await blob.UploadFromStreamAsync(ms);  
PC16             }  
PC17         }  
PC18     }  
PC19     private static CloudBlockBlob GetDRBBlob(CloudBlockBlob sourceBlob)  
PC20     {  
PC21         ***  
PC22     }  
PC23     private static async Task<CloudBlobContainer> GetCloudBlobContainer()  
PC24     {  
PC25         var cloudBlobClient = new CloudBlobClient(new Uri(" . . ."), await GetCredentials());  
PC26         await cloudBlobClient.GetRootContainerReference().CreateIfNotExistsAsync();  
PC27         return cloudBlobClient.GetRootContainerReference();  
PC28     }  
PC29     private static async Task<StorageCredentials> GetCredentials()  
PC30     {  
PC31         ***  
PC32     }  
PC33     private static async Task<List<IListFileItem>> ListFiles()  
PC34     {  
PC35         ***  
PC36     }  
PC37     private KeyVaultClient _keyVaultClient = new KeyVaultClient(" . . .");  
PC38 }  
PC39 }
```

Database.cs -

```
DB01 public class Database
DB02 {
DB03     private string ConnectionString =
DB04
DB05     public async Task<object> LoadUserDetails(string userId)
DB06     {
DB07
DB08         return await policy.ExecuteAsync(async () =>
DB09         {
DB10             using (var connection = new SqlConnection(ConnectionString))
DB11             {
DB12                 await connection.OpenAsync();
DB13                 using (var command = new SqlCommand("...", connection))
DB14                     using (var reader = command.ExecuteReader())
DB15                     {
DB16                         ...
DB17                     }
DB18                 }
DB19             });
DB20         }
DB21     }
```

ReceiptUploader.cs -

```
RU01 public class ReceiptUploader
RU02 {
RU03     public async Task UploadFile(string file, byte[] binary)
RU04     {
RU05         var httpClient = new HttpClient();
RU06         var response = await httpClient.PutAsync("...", new ByteArrayContent(binary));
RU07         while (ShouldRetry(response))
RU08         {
RU09             response = await httpClient.PutAsync("...", new ByteArrayContent(binary));
RU10         }
RU11     }
RU12     private bool ShouldRetry(HttpStatusCode response)
RU13     {
RU14
RU15     }
RU16 }
```

ConfigureSSE.ps1 -

```
CS01 $storageAccount = Get-AzureRmStorageAccount -ResourceGroupName "..." -AccountName "..."
CS02 $keyVault = Get-AzureRmKeyVault -VaultName "..."
CS03 $key = Get-AzureKeyVaultKey -VaultName $keyVault.VaultName -Name "..."
CS04 Set-AzureRmKeyVaultAccessPolicy ` 
CS05   -VaultName $keyVault.VaultName ` 
CS06   -ObjectId $storageAccount.Identity.PrincipalId ` 
CS07 
CS08 
CS09 Set-AzureRmStorageAccount ` 
CS10   -ResourceGroupName $storageAccount.ResourceGroupName ` 
CS11   -AccountName $storageAccount.StorageAccountName ` 
CS12   -EnableEncryptionService File ` 
CS13   -KeyvaultEncryption ` 
CS14   -KeyName $key.Name 
CS15   -KeyVersion $key.Version ` 
CS16   -KeyVaultUri $keyVault.VaultUri
```

**Question**

You need to ensure the security policies are met.

What code do you add at line CS07 of ConfigureSSE.ps1?

- A. "PermissionsToKeys create, encrypt, decrypt
- B. "PermissionsToCertificates create, encrypt, decrypt
- C. "PermissionsToCertificates wrapkey, unwrapkey, get
- D. "PermissionsToKeys wrapkey, unwrapkey, get

Topic 12:

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Background -

**Overview -**

You are a developer for Contoso, Ltd. The company has a social networking website that is developed as a Single Page Application (SPA). The main web application for the social networking website loads user uploaded content from blob storage.

You are developing a solution to monitor uploaded data for inappropriate content. The following process occurs when users upload content by using the SPA:

\* Messages are sent to ContentUploadService.

\* Content is processed by ContentAnalysisService.

\* After processing is complete, the content is posted to the social network or a rejection message is posted in its place.

The ContentAnalysisService is deployed with Azure Container Instances from a private Azure Container Registry named contosoimages.

The solution will use eight CPU cores.

Azure Active Directory -

Contoso, Ltd. uses Azure Active Directory (Azure AD) for both internal and guest accounts.

Requirements -

**ContentAnalysisService -**

The company's data science group built ContentAnalysisService which accepts user generated content as a string and returns a probable value for inappropriate content.

Any values over a specific threshold must be reviewed by an employee of Contoso, Ltd.

You must create an Azure Function named CheckUserContent to perform the content checks.

Costs -

You must minimize costs for all Azure services.

**Manual review -**

To review content, the user must authenticate to the website portion of the ContentAnalysisService using their Azure AD credentials. The website is built using React and all pages and API endpoints require authentication. In order to review content a user must be part of a ContentReviewer role. All completed reviews must include the reviewer's email address for auditing purposes.

**High availability -**

All services must run in multiple regions. The failure of any service in a region must not impact overall application availability.

**Monitoring -**

An alert must be raised if the ContentUploadService uses more than 80 percent of available CPU cores.

**Security -**

You have the following security requirements:

Any web service accessible over the Internet must be protected from cross site scripting attacks.

All websites and services must use SSL from a valid root certificate authority.

Azure Storage access keys must only be stored in memory and must be available only to the service.

All Internal services must only be accessible from internal Virtual Networks (VNets).

All parts of the system must support inbound and outbound traffic restrictions.

All service calls must be authenticated by using Azure AD.

**User agreements -**

When a user submits content, they must agree to a user agreement. The agreement allows employees of Contoso, Ltd. to review content, store cookies on user devices, and track user's IP addresses.

Information regarding agreements is used by multiple divisions within Contoso, Ltd.

User responses must not be lost and must be available to all parties regardless of individual service uptime. The volume of agreements is expected to be in the millions per hour.

**Validation testing -**

When a new version of the ContentAnalysisService is available the previous seven days of content must be processed with the new version to verify that the new version does not significantly deviate from the old version.

**Issues -**

Users of the ContentUploadService report that they occasionally see HTTP 502 responses on specific pages.

```

ContentUploadService -
CS01 apiVersion: '2018-10-01'
CS02 type: Microsoft.ContainerInstance/containerGroups
CS03 location: westus
CS04 name: contentUploadService
CS05 properties:
CS06   containers:
CS07     - name: service
CS08       properties:
CS09         image: contoso/contentUploadService:latest
CS10       ports:
CS11         - port: 80
CS12           protocol: TCP
CS13       resources:
CS14         requests:
CS15           cpu: 1.0
CS16           memoryInGB: 1.5
CS17
CS18 ipAddress:
CS19   ip: 10.23.121.112
CS20   ports:
CS21     - port: 80
CS22       protocol: TCP
CS23
CS24
CS25 networkProfile:
CS26
id: /subscriptions/98...19/resourceGroups/container/providers/Microsoft.Network/networkProfiles/subnet

```

ApplicationManifest -

```

AM01 {
AM02   "id" : "2b079f03-9b06-2d44-98bb-e9182901fcb6",
AM03   "appId" : "7118a7f0-b5c2-4c9d-833c-3d711396fe65",
AM04
AM05   "createdDateTime" : "2019-12-24T06:01:44Z",
AM06   "logoUrl" : null,
AM07   "logoutUrl" : null,
AM08   "name" : "ContentAnalysisService",
AM09
AM10
AM11   "orgRestrictions" : [],
AM12   "parentalControlSettings" : {
AM13     "countriesBlockedForMinors" : [],
AM14     "legalAgeGroupRule" : "Allow"
AM15   },
AM16   "passwordCredentials" : []
AM17 }

```

### Question

You need to monitor ContentUploadService according to the requirements.

Which command should you use?

- A. az monitor metrics alert create &gt; alert &gt;g &gt;| --scopes &gt;| --condition "avg Percentage CPU > 8"
- B. az monitor metrics alert create &gt;|n alert &gt;| --scopes &gt;| --condition "avg Percentage CPU > 800"
- C. az monitor metrics alert create &gt;|n alert &gt;| --scopes &gt;| --condition "CPU Usage > 800"
- D. az monitor metrics alert create &gt;|n alert &gt;| --scopes &gt;| --condition "CPU Usage > 8"

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CS08       properties:
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CS13       resources:
CS14         requests:
CS15           cpu: 1.0
CS16           memoryInGB: 1.5
CS17
CS18 ipAddress:
CS19   ip: 10.23.121.112
CS20   ports:
CS21     - port: 80
CS22     protocol: TCP
CS23
CS24
CS25 networkProfile:
CS26
id: /subscriptions/98...19/resourceGroups/container/providers/Microsoft.Network/networkProfiles/subnet

```

ApplicationManifest -

```

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AM02   "id" : "2b079f03-9b06-2d44-98bb-e9182901fcbe",
AM03   "appId" : "7118a7f0-b5c2-4c9d-833c-3d711396fe65",
AM04
AM05   "createdDateTime" : "2019-12-24T06:01:44Z",
AM06   "logoUrl" : null,
AM07   "logoutUrl" : null,
AM08   "name" : "ContentAnalysisService",
AM09
AM10
AM11   "orgRestrictions" : [],
AM12   "parentalControlSettings" : {
AM13     "countriesBlockedForMinors" : [],
AM14     "legalAgeGroupRule" : "Allow"
AM15   },
AM16   "passwordCredentials" : []

```

### Question

You need to investigate the http server log output to resolve the issue with the ContentUploadService.  
Which command should you use first?

- A. az webapp log
- B. az ams live-output
- C. az monitor activity-log
- D. az container attach

Topic 13:

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Background -

City Power & Light company provides electrical infrastructure monitoring solutions for homes and businesses. The company is migrating solutions to Azure.

Current environment -

Architecture overview -

The company has a public website located at <http://www.cpandi.com/>. The site is a single-page web application that runs in Azure App Service on Linux. The website uses files stored in Azure Storage and cached in Azure Content Delivery Network (CDN) to serve static content.

API Management and Azure Function App functions are used to process and store data in Azure Database for PostgreSQL. API Management is used to broker communications to the Azure Function app functions for Logic app integration. Logic apps are used to orchestrate the data processing while Service Bus and Event Grid handle messaging and events.

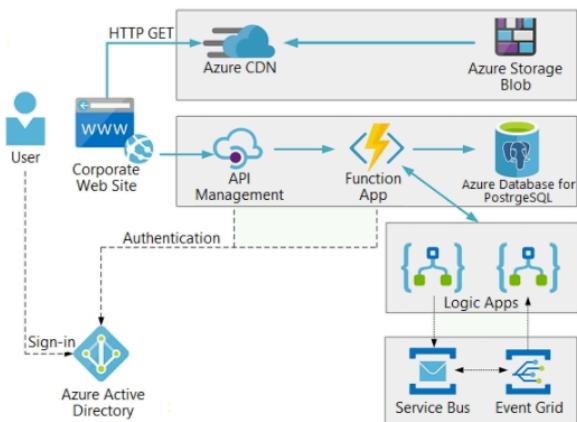
The solution uses Application Insights, Azure Monitor, and Azure Key Vault.

Architecture diagram -

The company has several applications and services that support their business. The company plans to implement serverless computing where possible. The overall architecture is shown below.

---

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#### User authentication -

The following steps detail the user authentication process:

1. The user selects Sign in in the website.
2. The browser redirects the user to the Azure Active Directory (Azure AD) sign in page.
3. The user signs in.
4. Azure AD redirects the user's session back to the web application. The URL includes an access token.
5. The web application calls an API and includes the access token in the authentication header. The application ID is sent as the audience ("aud") claim in the access token.
6. The back-end API validates the access token.

#### Requirements -

##### Corporate website -

Communications and content must be secured by using SSL.

Communications must use HTTPS.

Data must be replicated to a secondary region and three availability zones.

Data storage costs must be minimized.

##### Azure Database for PostgreSQL -

The database connection string is stored in Azure Key Vault with the following attributes:

Azure Key Vault name: cpandlkeyvault

Secret name: PostgreSQLConn

Id: 80df3e46ffcd4f1cb187f79905e9a1e8

The connection information is updated frequently. The application must always use the latest information to connect to the database.

Azure Service Bus and Azure Event Grid

Azure Event Grid must use Azure Service Bus for queue-based load leveling.

Events in Azure Event Grid must be routed directly to Service Bus queues for use in buffering.

Events from Azure Service Bus and other Azure services must continue to be routed to Azure Event Grid for processing.

Security -

All SSL certificates and credentials must be stored in Azure Key Vault.

File access must restrict access by IP, protocol, and Azure AD rights.

All user accounts and processes must receive only those privileges which are essential to perform their intended function.

Compliance -

Auditing of the file updates and transfers must be enabled to comply with General Data Protection Regulation (GDPR). The file updates must be read-only, stored in the order in which they occurred, include only create, update, delete, and copy operations, and be retained for compliance reasons.

Issues -

Corporate website -

While testing the site, the following error message displays:

CryptographicException: The system cannot find the file specified.

Function app -

You perform local testing for the RequestUserApproval function. The following error message displays:

'Timeout value of 00:10:00 exceeded by function: RequestUserApproval'

The same error message displays when you test the function in an Azure development environment when you run the following Kusto query:

FunctionAppLogs -

| where FunctionName = "RequestUserApproval"

Logic app -

You test the Logic app in a development environment. The following error message displays:

'400 Bad Request'

Troubleshooting of the error shows an HttpTrigger action to call the RequestUserApproval function.

Corporate website -

Security.cs:

```

SC01 public class Security
SC02 {
SC03 var bytes = System.IO.File.ReadAllBytes("~/var/ssl/private");
SC04 var cert = new System.Security.Cryptography.X509Certificate2(bytes);
SC05 var certName = cert.FriendlyName;
SC06 }

```

Function app -

RequestUserApproval.cs:

```

RA01 public static class RequestUserApproval
RA02 {
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RA04 public static async Task<IActionResult> Run(
RA05 [HttpTrigger(AuthorizationLevel.Function, "get", "post", Route = null)] HttpRequest req,
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RA07     log.LogInformation("RequestUserApproval function processed a request.");
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```

#### Question

You need to investigate the Azure Function app error message in the development environment.

What should you do?

- A. Connect Live Metrics Stream from Application Insights to the Azure Function app and filter the metrics.
- B. Create a new Azure Log Analytics workspace and instrument the Azure Function app with Application Insights.
- C. Update the Azure Function app with extension methods from Microsoft.Extensions.Logging to log events by using the log instance.
- D. Add a new diagnostic setting to the Azure Function app to send logs to Log Analytics.

#### Question #2

*Topic 13*

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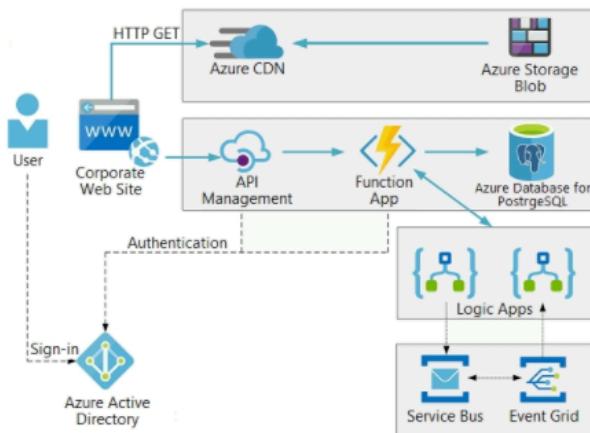
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**Question**

HOTSPOT -

You need to configure security and compliance for the corporate website files.

Which Azure Blob storage settings should you use? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.

Hot Area:

**Answer Area**

Action	Setting
Restrict file access	<div style="border: 1px solid #ccc; padding: 5px;"><input type="checkbox"/> role-based access control (RBAC) <input type="checkbox"/> managed identity <input type="checkbox"/> shared access signature (SAS) token <input type="checkbox"/> connection string</div>
Enable file auditing	<div style="border: 1px solid #ccc; padding: 5px;"><input type="checkbox"/> access tier <input type="checkbox"/> change feed <input type="checkbox"/> blob indexer <input type="checkbox"/> storage account type</div>

Topic 14

**Introductory Info**

Case study -

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Authentication events are used to monitor users signing in and signing out. All authentication events must be processed by Policy service. Sign outs must be processed as quickly as possible.

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You have an anomaly detection service that analyzes log information for anomalies. It is implemented as an Azure Machine Learning model. The model is deployed as a web service. If an anomaly is detected, an Azure Function that emails administrators is called by using an HTTP WebHook.

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All web applications and services have health monitoring at the /health service endpoint.

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Policy loss -

When you deploy Policy service, policies may not be applied if they were in the process of being applied during the deployment.

Performance issue -

When under heavy load, the anomaly detection service undergoes slowdowns and rejects connections.

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Users report that anomaly detection emails can sometimes arrive several minutes after an anomaly is detected.

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EG15
EG16             {
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EG38            {
EG39                {
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```

#### Question

DRAG DROP -

You need to implement the Log policy.

How should you complete the Azure Event Grid subscription? To answer, drag the appropriate JSON segments to the correct locations. Each JSON segment may be used once, more than once, or not at all. You may need to drag the split bar between panes to view content.

NOTE: Each correct selection is worth one point.

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How should you complete the Azure Event Grid subscription? To answer, drag the appropriate JSON segments to the correct locations. Each JSON segment may be used once, more than once, or not at all. You may need to drag the split bar between panes to view content.

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Select and Place:

#### Code segment

All
WebHook
EventHub
subjectEndsWith
Mictosoft.Storage
subjectBeginsWith
Microsoft.Storage.BlobCreated

#### Answer Area

```

{
    "name": "newlogs",
    "properties": {
        "topic": "/subscriptions/.../providers/Microsoft.EventGrid/topics/...",
        "destination": {
            "endpointType" : "code segment"
        },
        "filter": {
            "code segment": "/blobServices/default/containers/logdrop/",
            "includedEventTypes": [ "code segment" ],
            "labels": [],
            "eventDeliverySchema": "EventGridSchema"
        }
    }
}

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## Question

You need to ensure that the solution can meet the scaling requirements for Policy Service.

Which Azure Application Insights data model should you use?

- A. an Application Insights dependency
- B. an Application Insights event
- C. an Application Insights trace
- D. an Application Insights metric

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```

**Question**

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You need to implement telemetry for non-user actions.

How should you complete the Filter class? To answer, drag the appropriate code segments to the correct locations. Each code segment 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.

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Select and Place:

**Code segments**

/health  
/status  
RequestTelemetry  
PageViewTelemetry  
ITelemetryProcessor  
ITelemetryInitializer

**Answer Area**

```
public class Filter : code segment
{
    private readonly code segment _next;
    public (Filter code segment) next)
    {
        _next = next;
    }
    public void Process(ITelemetry item)
    {
        var x = item as code segment;
        if (x?.Url.AbsolutePath == " code segment")
        {
            return;
        }
        _next.Process(item);
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LE07     public string Serialize()
LE08     {
LE09         return JsonConvert.SerializeObject(this);
LE10     }
LE11 }
```

**Question**

DRAG DROP -

You need to ensure that PolicyLib requirements are met.

How should you complete the code segment? To answer, drag the appropriate code segments to the correct locations. Each code segment 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.

NOTE: Each correct selection is worth one point.

Select and Place:

Code segments	Answer Area
Process	public class IncludeEventId : <input type="text"/> code segment
Initialize	{
telemetry.Sequence	public void <input type="text"/> code segment (ITelemetry telemetry)
ITelemetryProcessor	{
ITelemetryInitializer	<input type="text"/> code segment .Properties["EventId"] =
telemetry.Context	<input type="text"/> code segment ;
EventGridController.EventId.Value	}
((EventTelemetry)telemetry).Properties["EventId"]	

Topic 15:

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Uploading using the web application

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Receipt and employee information is stored in an Azure SQL database.

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Requirements -

Receipt processing -

Concurrent processing of a receipt must be prevented.

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All access to Azure Storage and Azure SQL database must use the application's Managed Service Identity (MSI).

Receipt data must always be encrypted at rest.

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Employees occasionally report an issue with uploading a receipt using the web application. They report that when they upload a receipt using the Azure File Share, the receipt does not appear in their profile. When this occurs, they delete the file in the file share and use the web application, which returns a 500 Internal Server error page.

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Log capacity issue -

Developers report that the number of log messages in the trace output for the processor is too high, resulting in lost log messages.

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PC02 {  
PC03     public static class Function  
PC04     {  
PC05         [FunctionName("IssueWork")]  
PC06         public static async Task Run([TimerTrigger("0 */5 * * *")] TimerInfo timer, ILogger  
log)  
PC07         {  
PC08             var container = await GetCloudBlobContainer();  
PC09             foreach (var fileItem in await ListFiles())  
PC10             {  
PC11                 var file = new CloudFile(fileItem.StorageUri.PrimaryUri);  
PC12                 var ms = new MemoryStream();  
PC13                 await file.DownloadToStreamAsync(ms);  
PC14                 var blob = container.GetBlockBlobReference(fileItem.Uri.ToString());  
PC15                 await blob.UploadFromStreamAsync(ms);  
PC16             }  
PC17         }  
PC18     }  
PC19     private static CloudBlockBlob GetDRBlock(CloudBlockBlob sourceBlob)  
PC20     {  
PC21         . . .  
PC22     }  
PC23     private static async Task<CloudBlobContainer> GetCloudBlobContainer()  
PC24     {  
PC25         var cloudBlobClient = new CloudBlobClient(new Uri(" . . ."), await GetCredentials());  
PC26  
PC27         await cloudBlobClient.GetRootContainerReference().CreateIfNotExistsAsync();  
PC28         return cloudBlobClient.GetRootContainerReference();  
PC29     }  
PC30     private static async Task<StorageCredentials> GetCredentials()  
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PC32         . . .  
PC33     }  
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PC35         . . .
```

```
PC35  {
PC36  ...
PC37  }
PC38  private KeyVaultClient _keyVaultClient = new KeyVaultClient("...");  
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Database.cs -

```
DB01 public class Database
DB02 {
DB03  private string ConnectionString =
DB04
DB05  public async Task<object> LoadUserDetails(string userId)
DB06  {
DB07
DB08  return await policy.ExecuteAsync(async () =>
DB09  {
DB10  using (var connection = new SqlConnection(ConnectionString))
DB11  {
DB12    await connection.OpenAsync();
DB13    using (var command = new SqlCommand("...", connection))
DB14    using (var reader = command.ExecuteReader())
DB15    {
DB16      ...
DB17    }
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ReceiptUploader.cs -

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RU05    var httpClient = new HttpClient();
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RU07    while (ShouldRetry(response))
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RU14 }
```

```
RU14
RU15 }
RU16 }
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CS03 $key = Get-AzureKeyVaultKey -VaultName $keyVault.VaultName -Name "..."
CS04 Set-AzureRmKeyVaultAccessPolicy ` 
CS05 -VaultName $keyVault.VaultName ` 
CS06 -ObjectId $storageAccount.Identity.PrincipalId ` 
CS07
CS08
CS09 Set-AzureRmStorageAccount ` 
CS10 -ResourceGroupName $storageAccount.ResourceGroupName ` 
CS11 -AccountName $storageAccount.StorageAccountName ` 
CS12 -EnableEncryptionService File ` 
CS13 -KeyvaultEncryption ` 
CS14 -KeyName $key.Name
CS15 -KeyVersion $key.Version ` 
CS16 -KeyVaultUri $keyVault.VaultUri
```

**Question**

You need to ensure receipt processing occurs correctly.

What should you do?

- A. Use blob properties to prevent concurrency problems
- B. Use blob SnapshotTime to prevent concurrency problems
- C. Use blob metadata to prevent concurrency problems
- D. Use blob leases to prevent concurrency problems

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PC26
PC27         await cloudBlobClient.GetRootContainerReference().CreateIfNotExistsAsync();
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```

```
PC35  {
PC36      . . .
PC37  }
PC37  private KeyVaultClient _keyVaultClient = new KeyVaultClient("...");  
PC38  }  
  
PC39 }
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DB02 {
DB03     private string ConnectionString =
DB04
DB05     public async Task<object> LoadUserDetails(string userId)
DB06     {
DB07
DB08         return await policy.ExecuteAsync(async () =>
DB09         {
DB10             using (var connection = new SqlConnection(ConnectionString))
DB11             {
DB12                 await connection.OpenAsync();
DB13                 using (var command = new SqlCommand("...", connection))
DB14                     using (var reader = command.ExecuteReader())
DB15                     {
DB16                         ...
DB17                     }
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```

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CS13 -KeyvaultEncryption `  
CS14 -KeyName $key.Name  
CS15 -KeyVersion $key.Version `  
CS16 -KeyVaultUri $keyVault.VaultUri
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**Question**

You need to resolve the capacity issue.

What should you do?

- A. Convert the trigger on the Azure Function to an Azure Blob storage trigger
- B. Ensure that the consumption plan is configured correctly to allow scaling
- C. Move the Azure Function to a dedicated App Service Plan
- D. Update the loop starting on line PC09 to process items in parallel

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PC27             await cloudBlobClient.GetRootContainerReference().CreateIfNotExistsAsync();
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```
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```
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CS04 Set-AzureRmKeyVaultAccessPolicy `  
CS05 -VaultName $keyVault.VaultName `  
CS06 -ObjectId $storageAccount.Identity.PrincipalId `  
CS07  
CS08  
CS09 Set-AzureRmStorageAccount `  
CS10 -ResourceGroupName $storageAccount.ResourceGroupName `  
CS11 -AccountName $storageAccount.StorageAccountName `  
CS12 -EnableEncryptionService File `  
CS13 -KeyvaultEncryption `  
CS14 -KeyName $key.Name  
CS15 -KeyVersion $key.Version `  
CS16 -KeyVaultUri $keyVault.VaultUri
```

**Question**

You need to resolve the log capacity issue.

What should you do?

- A. Create an Application Insights Telemetry Filter
- B. Change the minimum log level in the host.json file for the function
- C. Implement Application Insights Sampling
- D. Set a LogCategoryFilter during startup

Topic 16:

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**LabelMaker app -**

Coho Winery produces, bottles, and distributes a variety of wines globally. You are a developer implementing highly scalable and resilient applications to support online order processing by using Azure solutions.

Coho Winery has a LabelMaker application that prints labels for wine bottles. The application sends data to several printers. The application consists of five modules that run independently on virtual machines (VMs). Coho Winery plans to move the application to Azure and continue to support label creation.

External partners send data to the LabelMaker application to include artwork and text for custom label designs.

**Requirements. Data -**

You identify the following requirements for data management and manipulation:

Order data is stored as nonrelational JSON and must be queried using SQL.

Changes to the Order data must reflect immediately across all partitions. All reads to the Order data must fetch the most recent writes.

**Requirements. Security -**

You have the following security requirements:

Users of Coho Winery applications must be able to provide access to documents, resources, and applications to external partners.

External partners must use their own credentials and authenticate with their organization's identity management solution.

External partner logins must be audited monthly for application use by a user account administrator to maintain company compliance.

Storage of e-commerce application settings must be maintained in Azure Key Vault.

E-commerce application sign-ins must be secured by using Azure App Service authentication and Azure Active Directory (AAD).

Conditional access policies must be applied at the application level to protect company content.

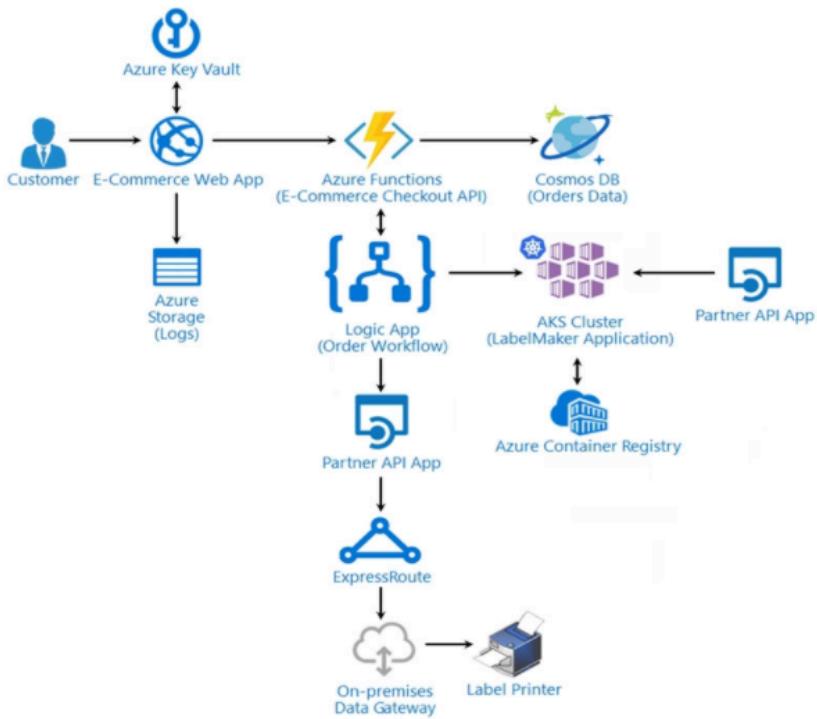
The LabelMaker application must be secured by using an AAD account that has full access to all namespaces of the Azure Kubernetes Service (AKS) cluster.

**Requirements. LabelMaker app -**

Azure Monitor Container Health must be used to monitor the performance of workloads that are deployed to Kubernetes environments and hosted on Azure Kubernetes Service (AKS).

You must use Azure Container Registry to publish images that support the AKS deployment.

Architecture -



Issues -

Calls to the Printer API App fail periodically due to printer communication timeouts.

Printer communication timeouts occur after 10 seconds. The label printer must only receive up to 5 attempts within one minute.

The order workflow fails to run upon initial deployment to Azure.

Order.json -

Relevant portions of the app files are shown below. Line numbers are included for reference only.

This JSON file contains a representation of the data for an order that includes a single item.

**Order.json**

```

01 {
02   "id" : 1,
03   "customers" : [
04     {
05       "familyName" : "Doe",
06       "givenName" : "John",
07       "customerid" : 5
08     }
09   ],
10   "line_items" : [
  
```

```
10  "line_items" : [
11  {
12    "fulfillable_quantity" : 1,
13    "id": 6,
14    "price" : "199.99" ,
15    "product_id" : 7513594,
16    "quantity": 1,
17    "requires_shipping" : true ,
18    "sku": "SFC-342-N" ,
19    "title" : "Surface Go" ,
20    "vendor" : "Microsoft" ,
21    "name" : "Surface Go - 8GB" ,
22    "taxable" : true ,
23    "tax_lines" : [
24    {
25      "title" : "State Tax" ,
26      "price" : "3.98" ,
27      "rate" : 0.06
28    }
29  ].
```

**Question**

You need to troubleshoot the order workflow.

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

NOTE: Each correct selection is worth one point.

- A. Review the API connections.
- B. Review the activity log.
- C. Review the run history.
- D. Review the trigger history.

**Introductory Info****Case study -**

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**LabelMaker app -**

Coho Winery produces, bottles, and distributes a variety of wines globally. You are a developer implementing highly scalable and resilient applications to support online order processing by using Azure solutions.

Coho Winery has a LabelMaker application that prints labels for wine bottles. The application sends data to several printers. The application consists of five modules that run independently on virtual machines (VMs). Coho Winery plans to move the application to Azure and continue to support label creation.

External partners send data to the LabelMaker application to include artwork and text for custom label designs.

**Requirements. Data -**

You identify the following requirements for data management and manipulation:

Order data is stored as nonrelational JSON and must be queried using SQL.

Changes to the Order data must reflect immediately across all partitions. All reads to the Order data must fetch the most recent writes.

**Requirements. Security -**

You have the following security requirements:

Users of Coho Winery applications must be able to provide access to documents, resources, and applications to external partners.

-

External partners must use their own credentials and authenticate with their organization's identity management solution.

External partner logins must be audited monthly for application use by a user account administrator to maintain company compliance.

Storage of e-commerce application settings must be maintained in Azure Key Vault.

E-commerce application sign-ins must be secured by using Azure App Service authentication and Azure Active Directory (AAD).

Conditional access policies must be applied at the application level to protect company content.

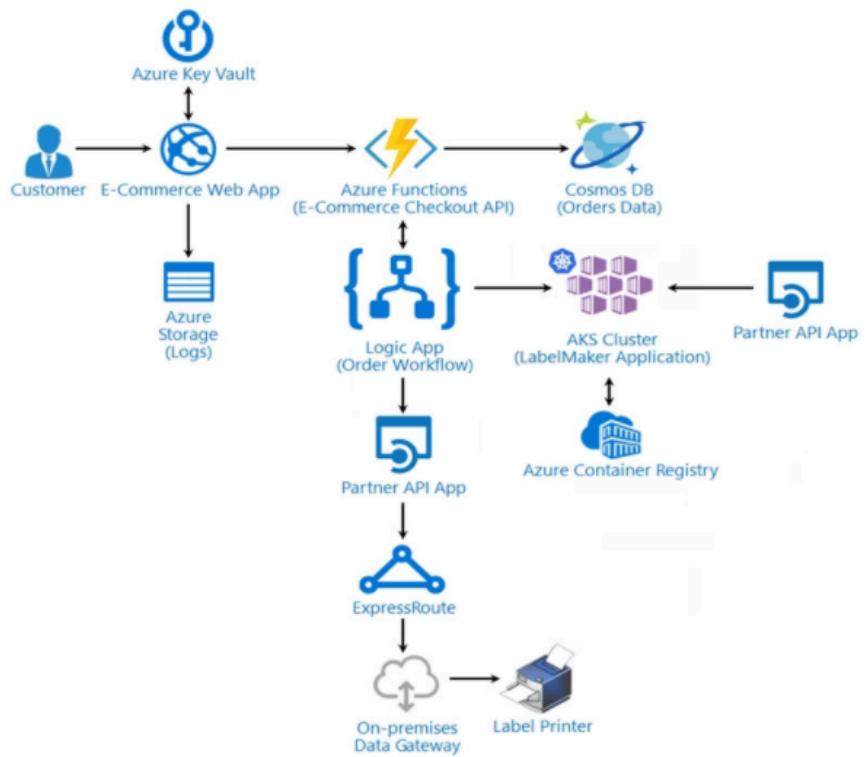
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**Requirements. LabelMaker app -**

Azure Monitor Container Health must be used to monitor the performance of workloads that are deployed to Kubernetes environments and hosted on Azure Kubernetes Service (AKS).

You must use Azure Container Registry to publish images that support the AKS deployment.

#### Architecture -



#### Issues -

Calls to the Printer API App fail periodically due to printer communication timeouts.

Printer communication timeouts occur after 10 seconds. The label printer must only receive up to 5 attempts within one minute.

The order workflow fails to run upon initial deployment to Azure.

#### Order.json -

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10   "line_items" : [
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26          "price" : "3.98" ,
27          "rate" : 0.06
28      }
29  1.

```

#### Question

HOTSPOT -

You need to update the order workflow to address the issue when calling the Printer API App.

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

NOTE: Each correct selection is worth one point.

Hot Area:

Hot Area:

#### Answer Area

```

"print_label": {
    "type": "Http",
    "inputs": {
        "method": "POST",
        "uri": "https://www.cohowinery.com/printer/printlabel",
        "retryPolicy": {
            "type": "dropdown"
            "options": [
                "default",
                "none",
                "fixed",
                "exponential"
            ]
        },
        "interval": "dropdown"
        "options": [
            "PT10S",
            "PT30S",
            "PT60S",
            "PT1D"
        ],
        "count": "dropdown"
        "options": [
            "5",
            "10",
            "60"
        ]
    }
}

```

## Topic 17

Question #1

Topic 17

### Introductory Info

#### Case study -

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#### Current environment -

##### Windows Server 2016 virtual machine

This virtual machine (VM) runs BizTalk Server 2016. The VM runs the following workflows:

Ocean Transport \*\* This workflow gathers and validates container information including container contents and arrival notices at various shipping ports.

Inland Transport \*\* This workflow gathers and validates trucking information including fuel usage, number of stops, and routes.

The VM supports the following REST API calls:

Container API \*\* This API provides container information including weight, contents, and other attributes.

Location API \*\* This API provides location information regarding shipping ports of call and trucking stops.

Shipping REST API \*\* This API provides shipping information for use and display on the shipping website.

#### Shipping Data -

The application uses MongoDB JSON document storage database for all container and transport information.

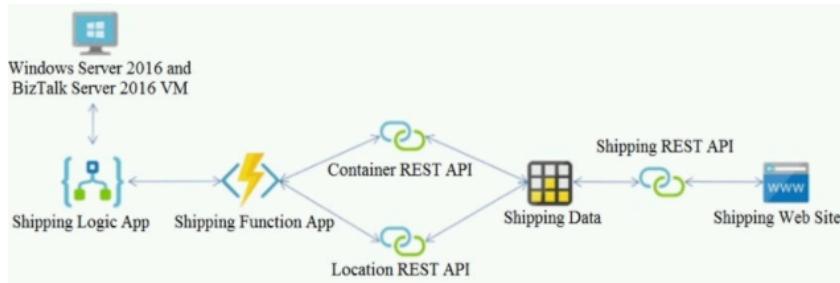
#### Shipping Web Site -

The site displays shipping container tracking information and container contents. The site is located at <http://shipping.wideworldimporters.com/>

#### Proposed solution -

The on-premises shipping application must be moved to Azure. The VM has been migrated to a new Standard\_D16s\_v3 Azure VM by using Azure Site Recovery and must remain running in Azure to complete the BizTalk component migrations. You create a Standard\_D16s\_v3 Azure VM to host BizTalk Server. The Azure architecture diagram for the proposed solution is shown below:

for the proposed solution is shown below:



#### Requirements -

##### Shipping Logic app -

The Shipping Logic app must meet the following requirements:

- Support the ocean transport and inland transport workflows by using a Logic App.
- Support industry-standard protocol X12 message format for various messages including vessel content details and arrival notices.
- Secure resources to the corporate VNet and use dedicated storage resources with a fixed costing model.
- Maintain on-premises connectivity to support legacy applications and final BizTalk migrations.

##### Shipping Function app -

Implement secure function endpoints by using app-level security and include Azure Active Directory (Azure AD).

##### REST APIs -

The REST API's that support the solution must meet the following requirements:

Secure resources to the corporate VNet.

- Allow deployment to a testing location within Azure while not incurring additional costs.
- Automatically scale to double capacity during peak shipping times while not causing application downtime.
- Minimize costs when selecting an Azure payment model.

##### Shipping data -

Data migration from on-premises to Azure must minimize costs and downtime.

##### Shipping website -

Use Azure Content Delivery Network (CDN) and ensure maximum performance for dynamic content while minimizing latency and costs.

#### Issues -

##### Windows Server 2016 VM -

The VM shows high network latency, jitter, and high CPU utilization. The VM is critical and has not been backed up in the past. The VM must enable a quick restore from a 7-day snapshot to include in-place restore of disks in case of failure.

Shipping website and REST APIs -

The following error message displays while you are testing the website:

Failed to load <http://test-shippingapi.wideworldimporters.com/>: No 'Access-Control-Allow-Origin' header is present on the requested resource. Origin '<http://test.wideworldimporters.com/>' is therefore not allowed access.

**Question**

DRAG DROP -

You need to support the message processing for the ocean transport workflow.

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

Select and Place:

Actions	Answer Area
Link the Logic App to the integration account.	
Add partners, schemas, certificates, maps, and agreements.	
Update the Logic App to use the partners, schemas, certificates, maps, and agreements.	
Create a custom connector for the Logic App.	
Link the custom connector to the Logic App.	
Create an integration account in the Azure portal.	

**Question #2**

*Topic 17*

**Introductory Info**

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Shipping Data -

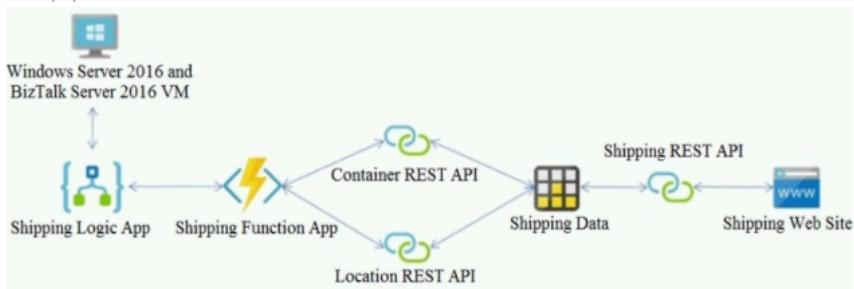
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#### Requirements -

##### Shipping Logic app -

The Shipping Logic app must meet the following requirements:

Support the ocean transport and inland transport workflows by using a Logic App.

Support industry-standard protocol X12 message format for various messages including vessel content details and arrival notices.

Secure resources to the corporate VNet and use dedicated storage resources with a fixed costing model.

Maintain on-premises connectivity to support legacy applications and final BizTalk migrations.

##### Shipping Function app -

Implement secure function endpoints by using app-level security and include Azure Active Directory (Azure AD).

##### REST APIs -

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Minimize costs when selecting an Azure payment model.

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'http://test.wideworldimporters.com/' is therefore not allowed access.

#### Question

You need to support the requirements for the Shipping Logic App.

What should you use?

- A. Azure Active Directory Application Proxy
- B. Site-to-Site (S2S) VPN connection
- C. On-premises Data Gateway
- D. Point-to-Site (P2S) VPN connection

**Introductory Info**

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Background -

City Power & Light company provides electrical infrastructure monitoring solutions for homes and businesses. The company is migrating solutions to Azure.

Current environment -

Architecture overview -

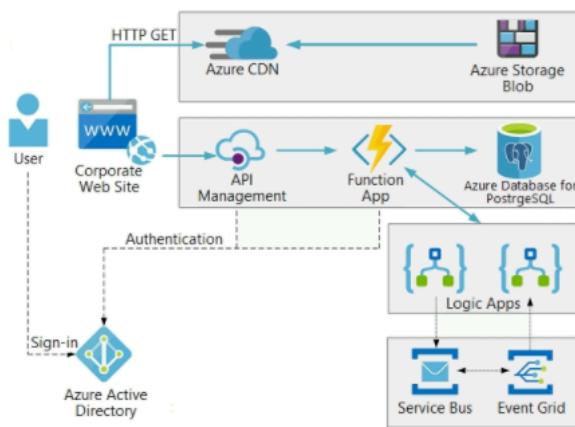
The company has a public website located at <http://www.cpndl.com/>. The site is a single-page web application that runs in Azure App Service on Linux. The website uses files stored in Azure Storage and cached in Azure Content Delivery Network (CDN) to serve static content.

API Management and Azure Function App functions are used to process and store data in Azure Database for PostgreSQL. API Management is used to broker communications to the Azure Function app functions for Logic app integration. Logic apps are used to orchestrate the data processing while Service Bus and Event Grid handle messaging and events.

The solution uses Application Insights, Azure Monitor, and Azure Key Vault.

Architecture diagram -

The company has several applications and services that support their business. The company plans to implement serverless computing where possible. The overall architecture is shown below.



User authentication -

The following steps detail the user authentication process:

1. The user selects Sign in in the website.
2. The browser redirects the user to the Azure Active Directory (Azure AD) sign in page.
3. The user signs in.
4. Azure AD redirects the user's session back to the web application. The URL includes an access token.
5. The web application calls an API and includes the access token in the authentication header. The application ID is sent as the audience ('aud') claim in the access token.
6. The back-end API validates the access token.

Requirements -

Corporate website -

Communications and content must be secured by using SSL.

Communications must use HTTPS.

Data must be replicated to a secondary region and three availability zones.

Data storage costs must be minimized.

Azure Database for PostgreSQL -

The database connection string is stored in Azure Key Vault with the following attributes:

Azure Key Vault name: cpandikkeyvault

Secret name: PostgreSQLConn

Id: 80df3e46ffcd4f1cb187f9905e9a1e8

The connection information is updated frequently. The application must always use the latest information to connect to the database.

Azure Service Bus and Azure Event Grid

Azure Event Grid must use Azure Service Bus for queue-based load leveling.

Events in Azure Event Grid must be routed directly to Service Bus queues for use in buffering.

Events from Azure Service Bus and other Azure services must continue to be routed to Azure Event Grid for processing.

Security -

All SSL certificates and credentials must be stored in Azure Key Vault.  
File access must restrict access by IP, protocol, and Azure AD rights.

All user accounts and processes must receive only those privileges which are essential to perform their intended function.

Compliance -

Auditing of the file updates and transfers must be enabled to comply with General Data Protection Regulation (GDPR). The file updates must be read-only, stored in the order in which they occurred, include only create, update, delete, and copy operations, and be retained for compliance reasons.

Issues -

Corporate website -

While testing the site, the following error message displays:  
CryptographicException: The system cannot find the file specified.

Function app -

You perform local testing for the RequestUserApproval function. The following error message displays:  
'Timeout value of 00:10:00 exceeded by function: RequestUserApproval'  
The same error message displays when you test the function in an Azure development environment when you run the following Kusto query:

FunctionAppLogs -

| where FunctionName == "RequestUserApproval"

Logic app -

You test the Logic app in a development environment. The following error message displays:  
'400 Bad Request'  
Troubleshooting of the error shows an HttpTrigger action to call the RequestUserApproval function.

Code -

Corporate website -

Security.cs:

```
SC01 public class Security
SC02 {
SC03 var bytes = System.IO.File.ReadAllBytes("~/var/ssl/private");
SC04 var cert = new System.Security.Cryptography.X509Certificate2(bytes);
SC05 var certName = cert.FriendlyName;
SC06 }
```

Function app -

RequestUserApproval.cs:

```
RA01 public static class RequestUserApproval
RA02 {
RA03 [FunctionName("RequestUserApproval")]
RA04 public static async Task<IActionResult> Run(
RA05 [HttpTrigger(AuthorizationLevel.Function, "get", "post", Route = null)] HttpRequest req,
ILogger log)
RA06 {
```

Function app -

RequestUserApproval.cs:

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RA04 public static async Task<IActionResult> Run(
RA05 [HttpTrigger(AuthorizationLevel.Function, "get", "post", Route = null)] HttpRequest req,
RA06 ILogger log)
RA07 {
RA08     log.LogInformation("RequestUserApproval function processed a request.");
RA09     ...
RA10     return ProcessRequest(req)
RA11     ? (ActionResult)new OkObjectResult($"User approval processed")
RA12     : new BadRequestObjectResult("Failed to process user approval");
RA13 }
RA14 private static bool ProcessRequest(HttpContext req)
RA15 {
RA16     ...
RA17 }
```

#### Question

You need to correct the RequestUserApproval Function app error.

What should you do?

- A. Update line RA13 to use the `async` keyword and return an `HttpRequest` object value.
- B. Configure the Function app to use an App Service hosting plan. Enable the Always On setting of the hosting plan.
- C. Update the function to be stateful by using Durable Functions to process the request payload.
- D. Update the `functionTimeout` property of the `host.json` project file to 15 minutes.

## Topic 19

### Question #1

### Topic 19

#### Introductory Info

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##### Background -

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##### Current environment -

##### Architecture overview -

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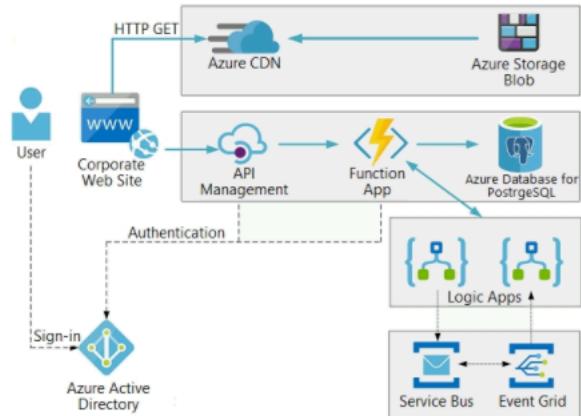
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#### Requirements -

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SC05     var certName = cert.FriendlyName;
SC06 }
```

Function app -  
RequestUserApproval.cs:

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RA04 public static async Task<IActionResult> Run(
RA05 [HttpTrigger(AuthorizationLevel.Function, "get", "post", Route = null)] HttpRequest req,
RA06 ILogger log)
RA07     log.LogInformation("RequestUserApproval function processed a request.");
RA08 ...
RA09     return ProcessRequest(req)
RA10     ? (ActionResult)new OkObjectResult($"User approval processed")
RA11     : new BadRequestObjectResult("Failed to process user approval");
RA12 }
RA13 private static bool ProcessRequest(HttpContext req)
RA14 {
RA15     ...
RA16 }
RA17 }
```

**Question**

HOTSPOT -

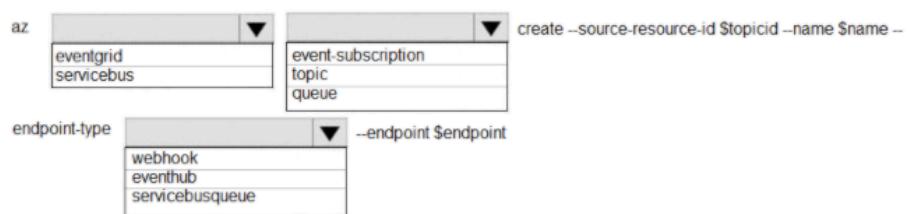
You need to configure the integration for Azure Service Bus and Azure Event Grid.

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

NOTE: Each correct selection is worth one point.

Hot Area:

**Answer Area**



**Introductory Info**

Case study -

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Background -

City Power & Light company provides electrical infrastructure monitoring solutions for homes and businesses. The company is migrating solutions to Azure.

Current environment -

Architecture overview -

The company has a public website located at <http://www.cpandi.com/>. The site is a single-page web application that runs in Azure App Service on Linux. The website uses files stored in Azure Storage and cached in Azure Content Delivery Network (CDN) to serve static content.

API Management and Azure Function App functions are used to process and store data in Azure Database for PostgreSQL. API Management is used to broker communications to the Azure Function app functions for Logic app integration. Logic apps are used to orchestrate the data processing while Service Bus and Event Grid handle messaging and events.

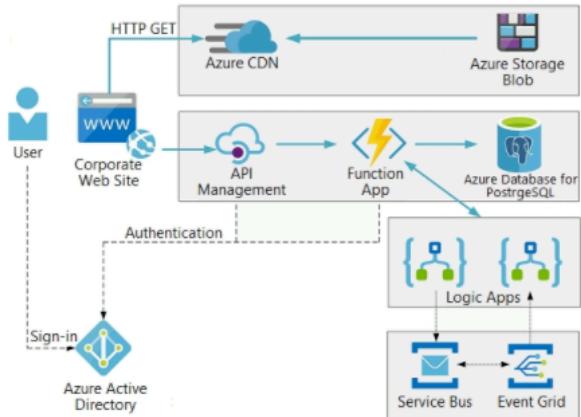
The solution uses Application Insights, Azure Monitor, and Azure Key Vault.

Architecture diagram -

The company has several applications and services that support their business. The company plans to implement serverless computing where possible. The overall architecture is shown below.

---

architecture is shown below.



#### User authentication -

The following steps detail the user authentication process:

1. The user selects Sign in in the website.
2. The browser redirects the user to the Azure Active Directory (Azure AD) sign in page.
3. The user signs in.
4. Azure AD redirects the user's session back to the web application. The URL includes an access token.
5. The web application calls an API and includes the access token in the authentication header. The application ID is sent as the audience ('`aud`') claim in the access token.
6. The back-end API validates the access token.

#### Requirements -

##### Corporate website -

Communications and content must be secured by using SSL.

Communications must use HTTPS.

Data must be replicated to a secondary region and three availability zones.

Data storage costs must be minimized.

##### Azure Database for PostgreSQL -

The database connection string is stored in Azure Key Vault with the following attributes:

Azure Key Vault name: cpandlkeyvault

Secret name: PostgreSQLConn

Id: 80df3e46ffcd4f1cb187f79905e9a1e8

The connection information is updated frequently. The application must always use the latest information to connect to the database.

##### Azure Service Bus and Azure Event Grid

Azure Event Grid must use Azure Service Bus for queue-based load leveling.

Events in Azure Event Grid must be routed directly to Service Bus queues for use in buffering.

Events from Azure Service Bus and other Azure services must continue to be routed to Azure Event Grid for processing.

Security -

All SSL certificates and credentials must be stored in Azure Key Vault.  
File access must restrict access by IP, protocol, and Azure AD rights.  
All user accounts and processes must receive only those privileges which are essential to perform their intended function.

Compliance -

Auditing of the file updates and transfers must be enabled to comply with General Data Protection Regulation (GDPR). The file updates must be read-only, stored in the order in which they occurred, include only create, update, delete, and copy operations, and be retained for compliance reasons.

Issues -

Corporate website -

While testing the site, the following error message displays:  
CryptographicException: The system cannot find the file specified.

Function app -

You perform local testing for the RequestUserApproval function. The following error message displays:  
'Timeout value of 00:10:00 exceeded by function: RequestUserApproval'  
The same error message displays when you test the function in an Azure development environment when you run the following Kusto query:

FunctionAppLogs -

| where FunctionName == "RequestUserApproval"

Logic app -

You test the Logic app in a development environment. The following error message displays:  
'400 Bad Request'  
Troubleshooting of the error shows an HttpTrigger action to call the RequestUserApproval function.

Code -

Corporate website -

Security.cs:

```
SC01 public class Security
SC02 {
SC03 var bytes = System.IO.File.ReadAllBytes("~/var/ssl/private");
SC04 var cert = new System.Security.Cryptography.X509Certificate2(bytes);
SC05 var certName = cert.FriendlyName;
SC06 }
```

Function app -

RequestUserApproval.cs:

```
RA01 public static class RequestUserApproval
RA02 {
RA03 [FunctionName("RequestUserApproval")]
RA04 public static async Task<IActionResult> Run(
RA05 [HttpTrigger(AuthorizationLevel.Function, "get", "post", Route = null)] HttpRequest req,
ILogger log)
RA06 {
RA07     log.LogInformation("RequestUserApproval function processed a request.");
RA08 ...
RA09     return ProcessRequest(req)
RA10     ? (ActionResult)new OkObjectResult($"User approval processed")
RA11     : new BadRequestObjectResult("Failed to process user approval");
RA12 }
RA13 private static bool ProcessRequest(HttpContext req)
RA14 {
RA15     ...
RA16 }
RA17 }
```

**Question**

You need to ensure that all messages from Azure Event Grid are processed.

What should you use?

- A. Azure Event Grid topic
- B. Azure Service Bus topic
- C. Azure Service Bus queue
- D. Azure Storage queue
- E. Azure Logic App custom connector

## Topic 20

Question #1

Topic 20

### Introductory Info

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Background -

You are a developer for Proseware, Inc. You are developing an application that applies a set of governance policies for Proseware's internal services, external services, and applications. The application will also provide a shared library for common functionality.

Requirements -

Policy service -

You develop and deploy a stateful ASP.NET Core 2.1 web application named Policy service to an Azure App Service Web App. The application reacts to events from Azure Event Grid and performs policy actions based on those events.

The application must include the Event Grid Event ID field in all Application Insights telemetry.

Policy service must use Application Insights to automatically scale with the number of policy actions that it is performing.

Policies -

Log policy -

All Azure App Service Web Apps must write logs to Azure Blob storage. All log files should be saved to a container named logdrop. Logs must remain in the container for 15 days.

Authentication events -

Authentication events are used to monitor users signing in and signing out. All authentication events must be processed by Policy service. Sign outs must be processed as quickly as possible.

PolicyLib -

You have a shared library named PolicyLib that contains functionality common to all ASP.NET Core web services and applications. The PolicyLib library must:

Exclude non-user actions from Application Insights telemetry.

Provide methods that allow a web service to scale itself.

Ensure that scaling actions do not disrupt application usage.

Other -

Anomaly detection service -

You have an anomaly detection service that analyzes log information for anomalies. It is implemented as an Azure Machine Learning model. The model is deployed as a web service. If an anomaly is detected, an Azure Function that emails administrators is called by using an HTTP WebHook.

Health monitoring -

All web applications and services have health monitoring at the /health service endpoint.

Issues -

Policy loss -

When you deploy Policy service, policies may not be applied if they were in the process of being applied during the deployment.

Performance issue -

When under heavy load, the anomaly detection service undergoes slowdowns and rejects connections.

Notification latency -

Users report that anomaly detection emails can sometimes arrive several minutes after an anomaly is detected.

App code -

EventGridController.cs -

Relevant portions of the app files are shown below. Line numbers are included for reference only and include a two-character prefix that denotes the specific file to which they belong.

```
EventGridController.cs
EG01 public class EventGridController : Controller
EG02 {
EG03     public static AsyncLocal<string> EventId = new AsyncLocal<string>();
EG04     public IActionResult Process([FromBody] string eventsJson)
EG05     {
EG06         var events = JArray.Parse(eventsJson);
EG07
EG08         foreach (var @event in events)
EG09         {
EG10             EventId.Value = @event["id"].ToString();
EG11             if (@event["topic"].ToString().Contains("providers/Microsoft.Storage"))
EG12             {
EG13                 SendToAnomalyDetectionService(@event["data"]["url"].ToString());
EG14             }
EG15
EG16             {
EG17                 EnsureLogging(@event["subject"].ToString());
EG18             }
EG19         }
EG20         return null;
EG21     }
EG22     private void EnsureLogging(string resource)
EG23     {
EG24         . . .
EG25     }
EG26     private async Task SendToAnomalyDetectionService(string uri)
EG27     {
EG28         var content = GetLogData(uri);
EG29         var scoreRequest = new
EG30         {
EG31             Inputs = new Dictionary<string, List<Dictionary<string, string>>()
EG32             {
EG33                 {
EG34                     "input1",
```

```

EG33     {
EG34         "input1",
EG35         new List<Dictionary<string, string>>()
EG36     {
EG37         new Dictionary<string, string>()
EG38     {
EG39         {
EG40             "logcontent", content
EG41         }
EG42     }
EG43   },
EG44   ),
EG45   },
EG46   GlobalParameters = new Dictionary<string, string>() { }
EG47 };
EG48 var result = await (new HttpClient()).PostAsJsonAsync("...", scoreRequest);
EG49 var rawModelResult = await result.Content.ReadAsStringAsync();
EG50 var modelResult = JObject.Parse(rawModelResult);
EG51 if (modelResult["notify"].HasValues)
EG52 {
EG53     . .
EG54 }
EG55 }
EG56 private (string name, string resourceGroup) ParseResourceId(string resourceId)
EG57 {
EG58     . .
EG59 }
EG60 private string GetLogData(string uri)
EG61 {
EG62     . .
EG63 }
EG64 static string BlobStoreAccountSAS(string containerName)
EG65 {
EG66     . .
EG67 }
EG68 }

```

#### LoginEvent.cs -

Relevant portions of the app files are shown below. Line numbers are included for reference only and include a two-character prefix that denotes the specific file to which they belong.

```

LoginEvent.cs
LE01 public class LoginEvent
LE02 {
LE03
LE04     public string subject { get; set; }
LE05     public DateTime eventTime { get; set; }
LE06     public Dictionary<string, string> data { get; set; }
LE07     public string Serialize()
LE08     {
LE09         return JsonConvert.SerializeObject(this);
LE10     }
LE11 }

```

#### Question

DRAG DROP -

You need to add code at line EG15 in EventGridController.cs to ensure that the Log policy applies to all services.

How should you complete the code? To answer, drag the appropriate code segments to the correct locations. Each code segment 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.

NOTE: Each correct selection is worth one point.

Select and Place:

#### Code segments

- topic
- status
- eventType
- Succeeded
- operationName
- resourceProvider

#### Answer Area

```

if {
    @event[ "data" ][ " code segment " ].ToString() == " code segment "
    &&
    @event[ "data" ][ " code segment " ].ToString() == "Microsoft.Web/sites/write"
}

```

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**Background -**

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**Requirements -****Policy service -**

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**Policies -****Log policy -**

All Azure App Service Web Apps must write logs to Azure Blob storage. All log files should be saved to a container named logdrop. Logs must remain in the container for 15 days.

**Authentication events -**

Authentication events are used to monitor users signing in and signing out. All authentication events must be processed by Policy service. Sign outs must be processed as quickly as possible.

**PolicyLib -**

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**Other -**

Anomaly detection service -

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Health monitoring -

All web applications and services have health monitoring at the /health service endpoint.

Issues -

Policy loss -

When you deploy Policy service, policies may not be applied if they were in the process of being applied during the deployment.

Performance issue -

When under heavy load, the anomaly detection service undergoes slowdowns and rejects connections.

Notification latency -

Users report that anomaly detection emails can sometimes arrive several minutes after an anomaly is detected.

App code -

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EventGridController.cs
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EG02 {
EG03     public static AsyncLocal<string> EventId = new AsyncLocal<string>();
EG04     public IActionResult Process([FromBody] string eventsJson)
EG05     {
EG06         var events = JArray.Parse(eventsJson);
EG07
EG08         foreach (var @event in events)
EG09         {
EG10             EventId.Value = @event["id"].ToString();
EG11             if (@event["topic"].ToString().Contains("providers/Microsoft.Storage"))
EG12             {
EG13                 SendToAnomalyDetectionService(@event["data"]["url"].ToString());
EG14             }
EG15
EG16             {
EG17                 EnsureLogging(@event["subject"].ToString());
EG18             }
EG19         }
EG20         return null;
EG21     }
EG22     private void EnsureLogging(string resource)
EG23     {
EG24         . .
EG25     }
EG26     private async Task SendToAnomalyDetectionService(string uri)
EG27     {
EG28         var content = GetLogData(uri);
EG29         var scoreRequest = new
EG30         {
EG31             Inputs = new Dictionary<string, List<Dictionary<string, string>>()
EG32             {
EG33                 {
EG34                     "input1",
```

```

EG34     "input1",
EG35     new ListDictionary<string, string>()
EG36     {
EG37         new Dictionary<string, string>()
EG38         {
EG39             "logcontent", content
EG40         }
EG41     }
EG42 }
EG43 },
EG44 ],
EG45 },
EG46 GlobalParameters = new Dictionary<string, string>() { }
EG47 };
EG48 var result = await (new HttpClient()).PostAsJsonAsync("...", scoreRequest);
EG49 var rawModelResult = await result.Content.ReadAsStringAsync();
EG50 var modelResult = JObject.Parse(rawModelResult);
EG51 if (modelResult["notify"].HasValues)
EG52 {
EG53     . .
EG54 }
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EG56 private (string name, string resourceGroup) ParseResourceId(string resourceId)
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EG58     . .
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EG60 private string GetLogData(string uri)
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LE03
LE04     public string subject { get; set; }
LE05     public DateTime eventTime { get; set; }
LE06     public Dictionary<string, string> data { get; set; }
LE07     public string Serialize()
LE08     {
LE09         return JsonConvert.SerializeObject(this);
LE10     }
LE11 }

```

#### Question

##### HOTSPOT -

You need to insert code at line LE03 of LoginEvent.cs to ensure that all authentication events are processed correctly.

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

NOTE: Each correct selection is worth one point.

Hot Area:

#### Answer Area

public string	<input type="text"/>	( get; set; )
	<input checked="" type="checkbox"/> id	
	<input checked="" type="checkbox"/> eventType	
	<input checked="" type="checkbox"/> dataVersion	
	<input checked="" type="checkbox"/> metadataVersion	
public string	<input type="text"/>	( get; set; )
	<input checked="" type="checkbox"/> id	
	<input checked="" type="checkbox"/> eventType	
	<input checked="" type="checkbox"/> dataVersion	
	<input checked="" type="checkbox"/> metadataVersion	
public string	<input type="text"/>	( get; set; )
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	<input checked="" type="checkbox"/> eventType	
	<input checked="" type="checkbox"/> dataVersion	
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Issues -

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EG58     ...
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EG60 private string GetLogData(string uri)
EG61 {
EG62     ...
EG63 }
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EG66     ...
EG67 }
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```

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#### LoginEvent.cs

```

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LE03
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LE05     public DateTime eventTime { get; set; }
LE06     public Dictionary<string, string> data { get; set; }
LE07     public string Serialize()
LE08     {
LE09         return JsonConvert.SerializeObject(this);
LE10     }
LE11 }

```

#### Question

HOTSPOT -

You need to implement the Log policy.

How should you complete the EnsureLogging method in EventGridController.cs? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.

Hot Area:

#### Answer Area

```

var client = new WebSiteManagementClient(. . .);
var id = ParseResourceID(resource);
var appSettings = new StringDictionary(name: "properties",
    properties: new Dictionary<string, string> {
        {"DIAGNOSTICS_AZUREBLOBCONTAINERSASURL", BlobStoreAccountSAS(" ")},
        {"DIAGNOSTICS_AZUREBLOBRETENTIONINDAYS", " "})
        15
        30
    });
client.WebApps. ( )
    UploadLoggingSettings
    UpdateApplicationSetting
    id.resourceGroup,
    id.name, appSettings);

```

## Topic 21

Question #1

Topic 21

### Introductory Info

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#### Background -

You are a developer for Proseware, Inc. You are developing an application that applies a set of governance policies for Proseware's internal services, external services, and applications. The application will also provide a shared library for common functionality.

#### Requirements -

#### Policy service -

You develop and deploy a stateful ASP.NET Core 2.1 web application named Policy service to an Azure App Service Web App. The application reacts to events from Azure Event Grid and performs policy actions based on those events.

The application must include the Event Grid Event ID field in all Application Insights telemetry.

Policy service must use Application Insights to automatically scale with the number of policy actions that it is performing.

#### Policies -

#### Log policy -

All Azure App Service Web Apps must write logs to Azure Blob storage. All log files should be saved to a container named logdrop. Logs must remain in the container for 15 days.

#### Authentication events -

Authentication events are used to monitor users signing in and signing out. All authentication events must be processed by Policy service. Sign outs must be processed as quickly as possible.

PolicyLib -

You have a shared library named PolicyLib that contains functionality common to all ASP.NET Core web services and applications. The PolicyLib library must:

- Exclude non-user actions from Application Insights telemetry.
- Provide methods that allow a web service to scale itself.
- Ensure that scaling actions do not disrupt application usage.

Other -

Anomaly detection service -

You have an anomaly detection service that analyzes log information for anomalies. It is implemented as an Azure Machine Learning model. The model is deployed as a web service. If an anomaly is detected, an Azure Function that emails administrators is called by using an HTTP WebHook.

Health monitoring -

All web applications and services have health monitoring at the /health service endpoint.

Issues -

Policy loss -

When you deploy Policy service, policies may not be applied if they were in the process of being applied during the deployment.

Performance issue -

When under heavy load, the anomaly detection service undergoes slowdowns and rejects connections.

Notification latency -

Users report that anomaly detection emails can sometimes arrive several minutes after an anomaly is detected.

App code -

EventGridController.cs -

Relevant portions of the app files are shown below. Line numbers are included for reference only and include a two-character prefix that denotes the specific file to which they belong.

```
EventGridController.cs
EG01 public class EventGridController : Controller
EG02 {
EG03     public static AsyncLocal<string> EventId = new AsyncLocal<string>();
EG04     public IActionResult Process([FromBody] string eventsJson)
EG05     {
EG06         var events = JArray.Parse(eventsJson);
EG07
EG08         foreach (var @event in events)
EG09         {
EG10             EventId.Value = @event["id"].ToString();
EG11             if (@event["topic"].ToString().Contains("providers/Microsoft.Storage"))
EG12             {
EG13                 SendToAnomalyDetectionService(@event["data"]["url"].ToString());
EG14             }
EG15
EG16             {
EG17                 EnsureLogging(@event["subject"].ToString());
EG18             }
EG19         }
EG20     return null;
EG21 }
```

```

EG20     return null;
EG21 }
EG22 private void EnsureLogging(string resource)
EG23 {
EG24     . .
EG25 }
EG26 private async Task SendToAnomalyDetectionService(string uri)
EG27 {
EG28     var content = GetLogData(uri);
EG29     var scoreRequest = new
EG30     {
EG31         Inputs = new Dictionary<string, List<Dictionary<string, string>>>()
EG32         {
EG33             [
EG34                 "input1",
EG35                 new List<Dictionary<string, string>>()
EG36                 [
EG37                     new Dictionary<string, string>()
EG38                     [
EG39                         [
EG40                             "logcontent", content
EG41                         ]
EG42                     ]
EG43                 ],
EG44             ],
EG45         },
EG46         GlobalParameters = new Dictionary<string, string>() { }
EG47     };
EG48     var result = await (new HttpClient()).PostAsJsonAsync("...", scoreRequest);
EG49     var rawModelResult = await result.Content.ReadAsStringAsync();
EG50     var modelResult = JObject.Parse(rawModelResult);
EG51     if (modelResult["notify"].HasValues)
EG52     {
EG53         . .
EG54     }
EG55 }
EG56 private (string name, string resourceGroup) ParseResourceId(string resourceId)
EG57 {
EG58     . .
EG59 }
EG60 private string GetLogData(string uri)
EG61 {
EG62     . .
EG63 }
EG64 static string BlobStoreAccountSAS(string containerName)
EG65 {
EG66     . .
EG67 }
EG68 }

```

#### LoginEvent.cs -

Relevant portions of the app files are shown below. Line numbers are included for reference only and include a two-character prefix that denotes the specific file to which they belong.

```

LoginEvent.cs
LE01 public class LoginEvent
LE02 {
LE03
LE04     public string subject { get; set; }
LE05     public DateTime eventTime { get; set; }
LE06     public Dictionary<string, string> data { get; set; }
LE07     public string Serialize()

```

```
LE07  public string Serialize()
LE08  {
LE09      return JsonConvert.SerializeObject(this);
LE10  }
LE11 }
```

**Question**

You need to resolve a notification latency issue.

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

NOTE: Each correct selection is worth one point.

- A. Set Always On to true.
- B. Ensure that the Azure Function is using an App Service plan.
- C. Set Always On to false.
- D. Ensure that the Azure Function is set to use a consumption plan.

Topic 22

**Introductory Info****Case study -**

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**Background -****Overview -**

You are a developer for Contoso, Ltd. The company has a social networking website that is developed as a Single Page Application (SPA). The main web application for the social networking website loads user uploaded content from blob storage.

You are developing a solution to monitor uploaded data for inappropriate content. The following process occurs when users upload content by using the SPA:

Messages are sent to ContentUploadService.

Content is processed by ContentAnalysisService.

After processing is complete, the content is posted to the social network or a rejection message is posted in its place.

The ContentAnalysisService is deployed with Azure Container Instances from a private Azure Container Registry named contosoimages.

The solution will use eight CPU cores.

**Azure Active Directory -**

Contoso, Ltd. uses Azure Active Directory (Azure AD) for both internal and guest accounts.

**Requirements -****ContentAnalysisService -**

The company's data science group built ContentAnalysisService which accepts user generated content as a string and returns a probable value for inappropriate content.

Any values over a specific threshold must be reviewed by an employee of Contoso, Ltd.

You must create an Azure Function named CheckUserContent to perform the content checks.

**Costs -**

You must minimize costs for all Azure services.

**Manual review -**

To review content, the user must authenticate to the website portion of the ContentAnalysisService using their Azure AD credentials. The website is built using

React and all pages and API endpoints require authentication. In order to review content a user must be part of a ContentReviewer role. All completed reviews must include the reviewer's email address for auditing purposes.

**High availability -**

All services must run in multiple regions. The failure of any service in a region must not impact overall application availability.

**Monitoring -**

An alert must be raised if the ContentUploadService uses more than 80 percent of available CPU cores.

**Security -**

You have the following security requirements:

Any web service accessible over the Internet must be protected from cross site scripting attacks.

All websites and services must use SSL from a valid root certificate authority.

Azure Storage access keys must only be stored in memory and must be available only to the service.

All internal services must only be accessible from internal Virtual Networks (VNets).

All parts of the system must support inbound and outbound traffic restrictions.

All service calls must be authenticated by using Azure AD.

**User agreements -**

When a user submits content, they must agree to a user agreement. The agreement allows employees of Contoso, Ltd. to review content, store cookies on user devices, and track user's IP addresses.

Information regarding agreements is used by multiple divisions within Contoso, Ltd.

User responses must not be lost and must be available to all parties regardless of individual service uptime. The volume of agreements is expected to be in the millions per hour.

**Validation testing -**

When a new version of the ContentAnalysisService is available the previous seven days of content must be processed with the new version to verify that the new version does not significantly deviate from the old version.

**Issues -**

Users of the ContentUploadService report that they occasionally see HTTP 502 responses on specific pages.

**Code -**

**ContentUploadService -**

```
CS01 apiVersion: '2018-10-01'
CS02 type: Microsoft.ContainerInstance/containerGroups
CS03 location: westus
CS04 name: contentUploadService
CS05 properties:
CS06   containers:
CS07     - name: service
CS08       properties:
CS09         image: contoso/contentUploadService:latest
CS10       ports:
CS11         - port: 80
CS12           protocol: TCP
CS13       resources:
CS14         requests:
CS15           cpu: 1.0
CS16           memoryInGB: 1.5
CS17
CS18 ipAddress:
CS19   ip: 10.23.121.112
CS20   ports:
```

```

CS21      - port: 80
CS22      protocol: TCP
CS23
CS24
CS25 networkProfile:
CS26
id: /subscriptions/98...19/resourceGroups/container/providers/Microsoft.Network/networkProfiles/subnet

```

ApplicationManifest -

```

AM01 {
AM02   "id" : "2b079f03-9b06-2d44-98bb-e9182901fc6",
AM03   "appId" : "7118a7f0-b5c2-4c9d-833c-3d711396fe65",
AM04
AM05   "createdDateTime" : "2019-12-24T06:01:44Z",
AM06   "logoUrl" : null,
AM07   "logoutUrl" : null,
AM08   "name" : "ContentAnalysisService",
AM09
AM10
AM11   "orgRestrictions" : [],
AM12   "parentalControlSettings" : {
AM13     "countriesBlockedForMinors" : [],
AM14     "legalAgeGroupRule" : "Allow"
AM15   },
AM16   "passwordCredentials" : []
AM17 }

```

**Question**

HOTSPOT -

You need to ensure that validation testing is triggered per the requirements.

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

NOTE: Each correct selection is worth one point.

Hot Area:

**Question**

HOTSPOT -

You need to ensure that validation testing is triggered per the requirements.

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

NOTE: Each correct selection is worth one point.

Hot Area:

**Answer Area**

```

var event = getEvent();
if (event.eventType === 'ImagePushed'
    && event.data.target === 'contentanalysiservice'
    && event.topic.contains('contosoimages'))
{
    startValidationTesting();
}

```

**Introductory Info**

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CS02 type: Microsoft.ContainerInstance/containerGroups
CS03 location: westus
CS04 name: contentUploadService
CS05 properties:
CS06   containers:
CS07     - name: service
CS08       properties:
CS09         image: contoso/contentUploadService:latest
CS10       ports:
CS11         - port: 80
CS12           protocol: TCP
CS13       resources:
CS14         requests:
CS15           cpu: 1.0
CS16           memoryInGB: 1.5
CS17
CS18 ipAddress:
CS19   ip: 10.23.121.112
CS20   ports:
...xx
```

```

CS20     ports:
CS21         - port: 80
CS22         protocol: TCP
CS23
CS24
CS25 networkProfile:
CS26 id: /subscriptions/98...19/resourceGroups/container/providers/Microsoft.Network/networkProfiles/subnet

```

ApplicationManifest -

```

AM01 {
AM02     "id" : "2b079f03-9b06-2d44-98bb-e9182901fcb6",
AM03     "appId" : "7118a7f0-b5c2-4c9d-833c-3d711396fe65",
AM04
AM05     "createdDateTime" : "2019-12-24T06:01:44Z",
AM06     "logoUrl" : null,
AM07     "logoutUrl" : null,
AM08     "name" : "ContentAnalysisService",
AM09
AM10
AM11     "orgRestrictions" : [],
AM12     "parentalControlSettings" : {
AM13         "countriesBlockedForMinors" : [],
AM14         "legalAgeGroupRule" : "Allow"
AM15     },
AM16     "passwordCredentials" : []
AM17 }

```

**Question**

You need to deploy the CheckUserContent Azure Function. The solution must meet the security and cost requirements.

Which hosting model should you use?

- A. Premium plan
- B. App Service plan
- C. Consumption plan

## Topic 23

**Introductory Info**

Case study -

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LabelMaker app -

Coho Winery produces, bottles, and distributes a variety of wines globally. You are a developer implementing highly scalable and resilient applications to support online order processing by using Azure solutions.

Coho Winery has a LabelMaker application that prints labels for wine bottles. The application sends data to several printers. The application consists of five modules that run independently on virtual machines (VMs). Coho Winery plans to move the application to Azure and continue to support label creation.

External partners send data to the LabelMaker application to include artwork and text for custom label designs.

Requirements. Data -

You identify the following requirements for data management and manipulation:

Order data is stored as nonrelational JSON and must be queried using SQL.

Changes to the Order data must reflect immediately across all partitions. All reads to the Order data must fetch the most recent writes.

Requirements. Security -

You have the following security requirements:

Users of Coho Winery applications must be able to provide access to documents, resources, and applications to external partners.

External partners must use their own credentials and authenticate with their organization's identity management solution.

External partner logins must be audited monthly for application use by a user account administrator to maintain company compliance.

Storage of e-commerce application settings must be maintained in Azure Key Vault.

E-commerce application sign-ins must be secured by using Azure App Service authentication and Azure Active Directory (AAD).

Conditional access policies must be applied at the application level to protect company content.

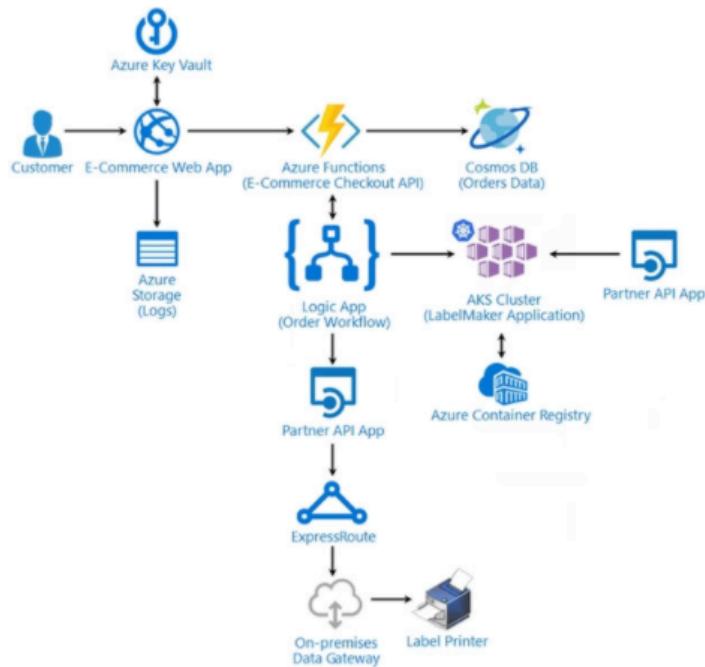
The LabelMaker application must be secured by using an AAD account that has full access to all namespaces of the Azure Kubernetes Service (AKS) cluster.

Requirements. LabelMaker app -

Azure Monitor Container Health must be used to monitor the performance of workloads that are deployed to Kubernetes environments and hosted on Azure Kubernetes Service (AKS).

You must use Azure Container Registry to publish images that support the AKS deployment.

#### Architecture -



#### Issues -

Calls to the Printer API App fail periodically due to printer communication timeouts.

Printer communication timeouts occur after 10 seconds. The label printer must only receive up to 5 attempts within one minute.

The order workflow fails to run upon initial deployment to Azure.

#### Order.json -

Relevant portions of the app files are shown below. Line numbers are included for reference only.

This JSON file contains a representation of the data for an order that includes a single item.

#### Order.json -

##### **Order.json**

```

01 {
02   "id" : 1,
03   "customers" : [
04     {
05       "familyName" : "Doe",
06       "givenName" : "John",
07       "customerid" : 5
08     }
09   ],
10   "line_items" : [
11     {
12       "fulfillable_quantity" : 1,
13       "id": 6,
14       "price" : "199.99" ,
15       "product_id" : 7513594,
16       "quantity": 1,
  
```

```
16     "quantity": 1,
17     "requires_shipping" : true ,
18     "sku": "SFC-342-N" ,
19     "title" : "Surface Go" ,
20     "vendor" : "Microsoft" ,
21     "name" : "Surface Go - 8GB" ,
22     "taxable" : true ,
23     "tax_lines" : [
24       {
25         "title" : "State Tax" ,
26         "price" : "3.98" ,
27         "rate" : 0.06
28       }
29     ],
30     "total_discount" : "5.00" ,
31     "discount_allocations" : [
32       {
33         "amount" : "5.00" ,
34         "discount_application_index" : 2
35       }
36     ]
```

**Question**

DRAG DROP -

You need to deploy a new version of the LabelMaker application to ACR.

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

Select and Place:

**Actions**

Log in to the registry and push image.

Create an alias of the image with a new build number.

Create an alias of the image with the fully qualified path to the registry.

Download the image to your local computer.

Build a new application image by using dockerfile.

**Answer area**

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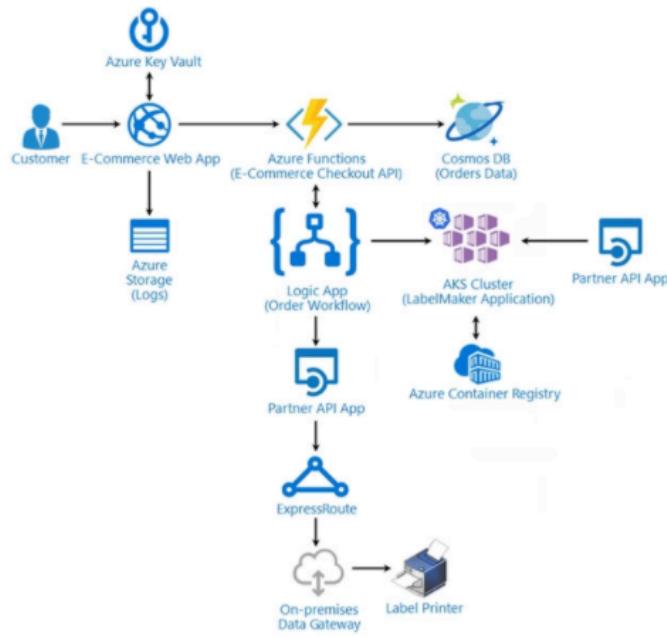
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03   "customers" : [
04     {
05       "familyName" : "Doe",
06       "givenName" : "John",
07       "customerid" : 5
08     }
09   ],
10   "line_items" : [
11     {
12       "fulfillable_quantity" : 1,
13       "id": 6,
14       "price" : "199.99" ,
15       "product_id" : 7513594,
16       "quantity": 1,
```

```
16     "quantity": 1,
17     "requires_shipping" : true ,
18     "sku": "SFC-342-N" ,
19     "title" : "Surface Go" ,
20     "vendor" : "Microsoft" ,
21     "name" : "Surface Go - 8GB" ,
22     "taxable" : true ,
23     "tax_lines" : [
24       {
25         "title" : "State Tax" ,
26         "price" : "3.98" ,
27         "rate" : 0.06
28       }
29     ],
30     "total_discount" : "5.00" ,
31     "discount_allocations" : [
32       {
33         "amount" : "5.00" ,
34         "discount_application_index" : 2
35       }
36     ]
```

**Question**

You need to access data from the user claim object in the e-commerce web app.

What should you do first?

- A. Write custom code to make a Microsoft Graph API call from the e-commerce web app.
  - B. Assign the Contributor RBAC role to the e-commerce web app by using the Resource Manager create role assignment API.
  - C. Update the e-commerce web app to read the HTTP request header values.
  - D. Using the Azure CLI, enable Cross-origin resource sharing (CORS) from the e-commerce checkout API to the e-commerce web app.
- 

## Topic 24

**Introductory Info**

## Case study -

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## Background -

## Overview -

You are a developer for Contoso, Ltd. The company has a social networking website that is developed as a Single Page Application (SPA). The main web application for the social networking website loads user uploaded content from blob storage.

You are developing a solution to monitor uploaded data for inappropriate content. The following process occurs when users upload content by using the SPA:

- \* Messages are sent to ContentUploadService.
- \* Content is processed by ContentAnalysisService.

\* After processing is complete, the content is posted to the social network or a rejection message is posted in its place.

The ContentAnalysisService is deployed with Azure Container Instances from a private Azure Container Registry named contosoimages.

The solution will use eight CPU cores.

## Azure Active Directory -

Contoso, Ltd. uses Azure Active Directory (Azure AD) for both internal and guest accounts.

## Requirements -

## ContentAnalysisService -

The company's data science group built ContentAnalysisService which accepts user generated content as a string and returns a probable value for inappropriate content. Any values over a specific threshold must be reviewed by an employee of Contoso, Ltd.

You must create an Azure Function named CheckUserContent to perform the content checks.

## Costs -

You must minimize costs for all Azure services.

## Manual review -

To review content, the user must authenticate to the website portion of the ContentAnalysisService using their Azure AD credentials. The website is built using React and all pages and API endpoints require authentication. In order to review content a user must be part of a ContentReviewer role. All completed reviews must include the reviewer's email address for auditing purposes.

---

#### High availability -

All services must run in multiple regions. The failure of any service in a region must not impact overall application availability.

#### Monitoring -

An alert must be raised if the ContentUploadService uses more than 80 percent of available CPU cores.

#### Security -

You have the following security requirements:

Any web service accessible over the Internet must be protected from cross site scripting attacks.

All websites and services must use SSL from a valid root certificate authority.

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User responses must not be lost and must be available to all parties regardless of individual service uptime. The volume of agreements is expected to be in the millions per hour.

#### Validation testing -

When a new version of the ContentAnalysisService is available the previous seven days of content must be processed with the new version to verify that the new version does not significantly deviate from the old version.

#### Issues -

Users of the ContentUploadService report that they occasionally see HTTP 502 responses on specific pages.

#### Code -

##### ContentUploadService -

```
CS01 apiVersion: '2018-10-01'
CS02 type: Microsoft.ContainerInstance/containerGroups
CS03 location: westus
CS04 name: contentUploadService
CS05 properties:
CS06   containers:
CS07     - name: service
CS08       properties:
CS09         image: contoso/contentUploadService:latest
CS10       ports:
CS11         - port: 80
CS12           protocol: TCP
CS13       resources:
CS14         requests:
CS15           cpu: 1.0
CS16           memoryInGB: 1.5
CS17
CS18 ipAddress:
```

```
CS18 ipAddress:  
CS19     ip: 10.23.121.112  
CS20     ports:  
CS21         - port: 80  
CS22         protocol: TCP  
CS23  
CS24  
CS25 networkProfile:  
CS26  
id: /subscriptions/98...19/resourceGroups/container/providers/Microsoft.Network/networkProfiles/subnet
```

ApplicationManifest -

```
AM01 {  
AM02     "id" : "2b079f03-9b06-2d44-98bb-e9182901fcb6",  
AM03     "appId" : "7118a7f0-b5c2-4c9d-833c-3d711396fe65",  
AM04  
AM05     "createdDateTime" : "2019-12-24T06:01:44Z",  
AM06     "logoUrl" : null,  
AM07     "logoutUrl" : null,  
AM08     "name" : "ContentAnalysisService",  
AM09  
AM10  
AM11     "orgRestrictions" : [],  
AM12     "parentalControlSettings" : {  
AM13         "countriesBlockedForMinors" : [],  
AM14         "legalAgeGroupRule" : "Allow"  
AM15     },  
AM16     "passwordCredentials" : []  
AM17 }
```

**Question**

You need to configure the ContentUploadService deployment.

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

NOTE: Each correct selection is worth one point.

- A. Add the following markup to line CS23: type: Private
- B. Add the following markup to line CS24: osType: Windows
- C. Add the following markup to line CS24: osType: Linux
- D. Add the following markup to line CS23: type: Public

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CS04 name: contentUploadService
CS05 properties:
CS06   containers:
CS07     - name: service
CS08       properties:
CS09         image: contoso/contentUploadService:latest
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CS11         - port: 80
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CS13       resources:
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CS15           cpu: 1.0
CS16           memoryInGB: 1.5
CS17
CS18 ipAddress:
```

```
CS18 ipAddress:  
CS19     ip: 10.23.121.112  
CS20     ports:  
CS21         - port: 80  
CS22         protocol: TCP  
CS23  
CS24  
CS25 networkProfile:  
CS26  
id: /subscriptions/98...19/resourceGroups/container/providers/Microsoft.Network/networkProfiles/subnet  
  
ApplicationManifest -  
AM01 {  
AM02     "id" : "2b079f03-9b06-2d44-98bb-e9182901fc6",  
AM03     "appId" : "7118a7f0-b5c2-4c9d-833c-3d711396fe65",  
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AM14         "legalAgeGroupRule" : "Allow"  
AM15     },  
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```

**Question**

You need to store the user agreements.

Where should you store the agreement after it is completed?

- A. Azure Storage queue
- B. Azure Event Hub
- C. Azure Service Bus topic
- D. Azure Event Grid topic

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CS02 type: Microsoft.ContainerInstance/containerGroups
CS03 location: westus
CS04 name: contentUploadService
CS05 properties:
CS06   containers:
CS07     - name: service
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CS10       ports:
CS11         - port: 80
CS12           protocol: TCP
CS13       resources:
CS14         requests:
CS15           cpu: 1.0
CS16           memoryInGB: 1.5
CS17
CS18 ipAddress:
```

```
CS18 ipAddress:  
CS19     ip: 10.23.121.112  
CS20     ports:  
CS21         - port: 80  
CS22         protocol: TCP  
CS23  
CS24  
CS25 networkProfile:  
CS26  
id: /subscriptions/98...19/resourceGroups/container/providers/Microsoft.Network/networkProfiles/subnet
```

ApplicationManifest -

```
AM01 {  
AM02     "id" : "2b079f03-9b06-2d44-98bb-e9182901fcb6",  
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AM04  
AM05     "createdDateTime" : "2019-12-24T06:01:44Z",  
AM06     "logoUrl" : null,  
AM07     "logoutUrl" : null,  
AM08     "name" : "ContentAnalysisService",  
AM09  
AM10  
AM11     "orgRestrictions" : [],  
AM12     "parentalControlSettings" : {  
AM13         "countriesBlockedForMinors" : [],  
AM14         "legalAgeGroupRule" : "Allow"  
AM15     },  
AM16     "passwordCredentials" : []  
AM17 }
```

Question

HOTSPOT -

You need to implement the bindings for the CheckUserContent function.

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

NOTE: Each correct selection is worth one point.

Hot Area:

**Question**

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

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Hot Area:

**Answer Area**

```
public static class CheckUserContent
{
    [FunctionName("CheckUserContent")]
    public static void Run(
        [QueueTrigger("userContent")] string content,
        [BlobTrigger("userContent/{name}")] Stream output)
    {
        ...
    }
}
```

Topic 25

**Introductory Info**

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Background -

City Power & Light company provides electrical infrastructure monitoring solutions for homes and businesses. The company is migrating solutions to Azure.

Current environment -

Architecture overview -

The company has a public website located at <http://www.cpndl.com/>. The site is a single-page web application that runs in Azure App Service on Linux. The website uses files stored in Azure Storage and cached in Azure Content Delivery Network (CDN) to serve static content.

API Management and Azure Function App functions are used to process and store data in Azure Database for PostgreSQL. API Management is used to broker communications to the Azure Function app functions for Logic app integration. Logic apps are used to orchestrate the data processing while Service Bus and Event Grid handle messaging and events.

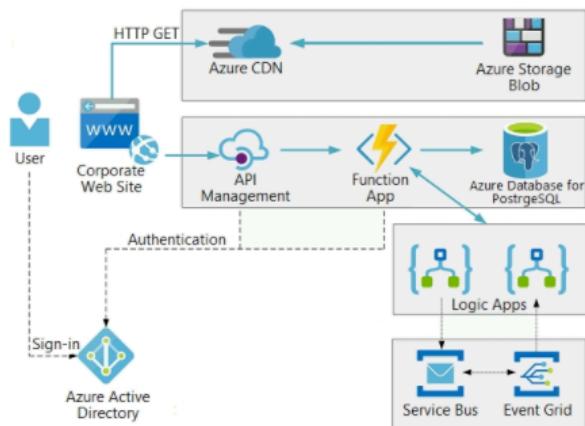
The solution uses Application Insights, Azure Monitor, and Azure Key Vault.

Architecture diagram -

The company has several applications and services that support their business. The company plans to implement serverless computing where possible. The overall architecture is shown below.

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User authentication -

The following steps detail the user authentication process:

1. The user selects Sign in in the website.
2. The browser redirects the user to the Azure Active Directory (Azure AD) sign in page.
3. The user signs in.
4. Azure AD redirects the user's session back to the web application. The URL includes an access token.
5. The web application calls an API and includes the access token in the authentication header. The application ID is sent as the audience ('`aud`') claim in the access token.
6. The back-end API validates the access token.

Requirements -

Corporate website -

Communications and content must be secured by using SSL.

Communications must use HTTPS.

Data must be replicated to a secondary region and three availability zones.

Data storage costs must be minimized.

Azure Database for PostgreSQL -

The database connection string is stored in Azure Key Vault with the following attributes:

Azure Key Vault name: cpandlkeyvault

Secret name: PostgreSQLConn

Id: 80df3e46ffcd4f1cb18779905e9a1e8

The connection information is updated frequently. The application must always use the latest information to connect to the database.

Azure Service Bus and Azure Event Grid

Azure Event Grid must use Azure Service Bus for queue-based load leveling.

Events in Azure Event Grid must be routed directly to Service Bus queues for use in buffering.

Events from Azure Service Bus and other Azure services must continue to be routed to Azure Event Grid for processing.

Security -

All SSL certificates and credentials must be stored in Azure Key Vault.

File access must restrict access by IP, protocol, and Azure AD rights.

All user accounts and processes must receive only those privileges which are essential to perform their intended function.

Compliance -

Auditing of the file updates and transfers must be enabled to comply with General Data Protection Regulation (GDPR). The file updates must be read-only, stored in the order in which they occurred, include only create, update, delete, and copy operations, and be retained for compliance reasons.

Issues -

Corporate website -

While testing the site, the following error message displays:

CryptographicException: The system cannot find the file specified.

Function app -

You perform local testing for the RequestUserApproval function. The following error message displays:

'Timeout value of 00:10:00 exceeded by function: RequestUserApproval'

The same error message displays when you test the function in an Azure development environment when you run the following Kusto query:

FunctionAppLogs -

| where FunctionName == "RequestUserApproval"

Logic app -

You test the Logic app in a development environment. The following error message displays:

'400 Bad Request'

Troubleshooting of the error shows an HttpTrigger action to call the RequestUserApproval function.

Code -

Corporate website -

Security.cs:

```
SC01 public class Security
SC02 {
SC03 var bytes = System.IO.File.ReadAllBytes("~/var/ssl/private");
SC04 var cert = new System.Security.Cryptography.X509Certificate2(bytes);
SC05 var certName = cert.FriendlyName;
SC06 }
```

Function app -

RequestUserApproval.cs:

```
RA01 public static class RequestUserApproval
RA02 {
RA03 [FunctionName("RequestUserApproval")]
RA04 public static async Task<IActionResult> Run(
RA05 [HttpTrigger(AuthorizationLevel.Function, "get", "post", Route = null)] HttpRequest req,
ILogger log)
```

```
RA05 [HttpTrigger(AuthorizationLevel.Function, "get", "post", Route = null)] HttpRequest req.  
ILogger log)  
RA06 {  
RA07     log.LogInformation("RequestUserApproval function processed a request.");  
RA08 ...  
RA09     return ProcessRequest(req)  
RA10     ? (ActionResult)new OkObjectResult($"User approval processed")  
RA11     : new BadRequestObjectResult("Failed to process user approval");  
RA12 }  
RA13 private static bool ProcessRequest(HttpRequest req)  
RA14 {  
RA15     ...  
RA16 }  
RA17 }
```

#### Question

HOTSPOT -

You need to configure the Account Kind, Replication, and Storage tier options for the corporate website's Azure Storage account.

How should you complete the configuration? To answer, select the appropriate options in the dialog box in the answer area.

NOTE: Each correct selection is worth one point.

Hot Area:

## Create storage account

Basics Networking Advanced Tags Review + create

Azure Storage is a Microsoft-managed service providing cloud storage that is highly available, secure, durable, scalable, and redundant. Azure Storage includes Azure Blobs (objects), Azure Data Lake Storage Gen2, Azure Files, Azure Queues, and Azure Tables. The cost of your storage account depends on the usage and the options you choose below.

#### Project details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription *	Visual Studio Enterprise
Resource group *	(New) cplcorporatesite
	<a href="#">Create new</a>

#### Instance details

The default deployment model is Resource Manager, which supports the latest Azure features. You may choose to deploy using the classic deployment model instead. [Choose classic deployment model](#)

Storage account name ⓘ *	corporatewebsitecontent
Location *	(US) East US
Performance ⓘ	<input checked="" type="radio"/> Standard <input type="radio"/> Premium
Account kind ⓘ	

#### Instance details

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Storage account name (1) \*  ✓

Location \*  ▼

Performance (1)  Standard  Premium

Account kind (1)  ▼

StorageV2 (general purpose v2)
Storage (general purpose v1)
BlobStorage

Replication (1)  ▼

Locally-redundant storage (LRS)
Zone-redundant storage (ZRS)
Geo-redundant storage (GRS)
Read-access geo-redundant storage (RA-GRS)
Geo-zone-redundant storage (GZRS)
Read-access geo-zone-redundant storage (RA-GZRS)

Access tier (default) (1)  Cool  Hot

Topic 26

**Topic 26 - Testlet 8****Question #1****Topic 26****Introductory Info**

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Background -

You are a developer for Litware Inc., a SaaS company that provides a solution for managing employee expenses. The solution consists of an ASP.NET Core Web API project that is deployed as an Azure Web App.

Overall architecture -

Employees upload receipts for the system to process. When processing is complete, the employee receives a summary report email that details the processing results. Employees then use a web application to manage their receipts and perform any additional tasks needed for reimbursement.

Receipt processing -

Employees may upload receipts in two ways:

Uploading using an Azure Files mounted folder

Uploading using the web application

Data Storage -

Receipt and employee information is stored in an Azure SQL database.

Documentation -

Employees are provided with a getting started document when they first use the solution. The documentation includes details on supported operating systems for Azure File upload, and instructions on how to configure the mounted folder.

Solution details -

Users table -

Column	Description
UserId	unique identifier for an employee
ExpenseAccount	employee's expense account number in the format 1234-123-1234
AllowedAmount	limit of allowed expenses before approval is needed
SupervisorId	unique identifier for employee's supervisor
SecurityPin	value used to validate user identity

Web Application -

You enable MSI for the Web App and configure the Web App to use the security principal name WebAppIdentity.

1.

**Processing -**

Processing is performed by an Azure Function that uses version 2 of the Azure Function runtime. Once processing is completed, results are stored in Azure Blob Storage and an Azure SQL database. Then, an email summary is sent to the user with a link to the processing report. The link to the report must remain valid if the email is forwarded to another user.

**Logging -**

Azure Application Insights is used for telemetry and logging in both the processor and the web application. The processor also has TraceWriter logging enabled. Application Insights must always contain all log messages.

**Requirements -**

**Receipt processing -**

Concurrent processing of a receipt must be prevented.

**Disaster recovery -**

Regional outage must not impact application availability. All DR operations must not be dependent on application running and must ensure that data in the DR region is up to date.

**Security -**

User's SecurityPin must be stored in such a way that access to the database does not allow the viewing of SecurityPins. The web application is the only system that should have access to SecurityPins.

All certificates and secrets used to secure data must be stored in Azure Key Vault.

You must adhere to the principle of least privilege and provide privileges which are essential to perform the intended function.

All access to Azure Storage and Azure SQL database must use the application's Managed Service Identity (MSI).

Receipt data must always be encrypted at rest.

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User's expense account number must be visible only to logged in users. All other views of the expense account number should include only the last segment, with the remaining parts obscured.

In the case of a security breach, access to all summary reports must be revoked without impacting other parts of the system.

**Issues -**

**Upload format issue -**

Employees occasionally report an issue with uploading a receipt using the web application. They report that when they upload a receipt using the Azure File Share, the receipt does not appear in their profile. When this occurs, they delete the file in the file share and use the web application, which returns a 500 Internal Server error page.

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Developers report that the number of log messages in the trace output for the processor is too high, resulting in lost log messages.

**Application code -**

**Processing.cs -**

```
PC01 public static class Processing
PC02 {
PC03     public static class Function
PC04     {
PC05         [FunctionName("IssueWork")]
PC06         public static async Task Run([TimerTrigger("0 */5 * * *")] TimerInfo timer, ILogger<log>
PC07         {
PC08             var container = await GetCloudBlobContainer();
```

```

PC07    {
PC08        var container = await GetCloudBlobContainer();
PC09        foreach (var fileItem in await ListFiles())
PC10        {
PC11            var file = new CloudFile(fileItem.StorageUri.PrimaryUri);
PC12            var ms = new MemoryStream();
PC13            await file.DownloadToStreamAsync(ms);
PC14            var blob = container.GetBlockBlobReference(fileItem.Uri.ToString());
PC15            await blob.UploadFromStreamAsync(ms);
PC16        }
PC17    }
PC18 }
PC19 private static CloudBlockBlob GetDRBBlob(CloudBlockBlob sourceBlob)
PC20 {
PC21     . .
PC22 }
PC23 private static async Task<CloudBlobContainer> GetCloudBlobContainer()
PC24 {
PC25     var cloudBlobClient = new CloudBlobClient(new Uri(" . ."), await GetCredentials());
PC26
PC27     await cloudBlobClient.GetRootContainerReference().CreateIfNotExistsAsync();
PC28     return cloudBlobClient.GetRootContainerReference();
PC29 }
PC30 private static async Task<StorageCredentials> GetCredentials()
PC31 {
PC32     . .
PC33 }
PC34 private static async Task<List<IListFileItem>> ListFiles()
PC35 {
PC36     . .
PC37 }
PC37 private KeyVaultClient _keyVaultClient = new KeyVaultClient(" . .");
PC38 }
PC39 }

```

Database.cs -

```

DB01 public class Database
DB02 {
DB03     private string ConnectionString =
DB04
DB05     public async Task<object> LoadUserDetails(string userId)
DB06     {
DB07
DB08         return await policy.ExecuteAsync(async () =>
DB09         {
DB10             using (var connection = new SqlConnection(ConnectionString))
DB11             {
DB12                 await connection.OpenAsync();
DB13                 using (var command = new SqlCommand(" . ", connection))
DB14                     using (var reader = command.ExecuteReader())
DB15                     {
DB16                         -
DB17                     }
DB18                 }
DB19             });
DB20     }
DB21 }

```

---

```
ReceiptUploader.cs -
```

```
RU01 public class ReceiptUploader
RU02 {
RU03     public async Task UploadFile(string file, byte[] binary)
RU04     {
RU05         var httpClient = new HttpClient();
RU06         var response = await httpClient.PutAsync("...", new ByteArrayContent(binary));
RU07         while (ShouldRetry(response))
RU08         {
RU09             response = await httpClient.PutAsync("...", new ByteArrayContent(binary));
RU10         }
RU11     }
RU12     private bool ShouldRetry(HttpStatusCode response)
RU13     {
RU14     }
RU15 }
RU16 }
```

```
ConfigureSSE.ps1 -
```

```
CS01 $storageAccount = Get-AzureRmStorageAccount -ResourceGroupName "..." -AccountName "..."
CS02 $keyVault = Get-AzureRmKeyVault -VaultName "..."
CS03 $key = Get-AzureKeyVaultKey -VaultName $keyVault.VaultName -Name "..."
CS04 Set-AzureRmKeyVaultAccessPolicy `
CS05 -VaultName $keyVault.VaultName ` 
CS06 -ObjectId $storageAccount.Identity.PrincipalId ` 
CS07
CS08
CS09 Set-AzureRmStorageAccount ` 
CS10 -ResourceGroupName $storageAccount.ResourceGroupName ` 
CS11 -AccountName $storageAccount.StorageAccountName ` 
CS12 -EnableEncryptionService File ` 
CS13 -KeyvaultEncryption ` 
CS14 -KeyName $key.Name ` 
CS15 -KeyVersion $key.Version ` 
CS16 -KeyVaultUri $keyVault.VaultUri
```

#### Question

DRAG DROP -

You need to add code at line PC32 in Processing.cs to implement the GetCredentials method in the Processing class.

How should you complete the code? To answer, drag the appropriate code segments to the correct locations. Each code segment 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.

NOTE: Each correct selection is worth one point.

Select and Place:

#### Code segments

```
MSITokenProvider("...", null)
tp.GetAccessTokenAsync("...")
AzureServiceTokenProvider()
StringTokenProvider("storage", "msi")
tp.GetAuthenticationHeaderAsync(CancellationToken.None)
```

#### Answer Area

```
var tp = new _____ code segment
var t = new TokenCredential(await _____ code segment
return new StorageCredentials(t);});
```

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**Background -**

You are a developer for Litware Inc., a SaaS company that provides a solution for managing employee expenses. The solution consists of an ASP.NET Core Web API project that is deployed as an Azure Web App.

**Overall architecture -**

Employees upload receipts for the system to process. When processing is complete, the employee receives a summary report email that details the processing results. Employees then use a web application to manage their receipts and perform any additional tasks needed for reimbursement.

**Receipt processing -**

Employees may upload receipts in two ways:

Uploading using an Azure Files mounted folder

Uploading using the web application

**Data Storage -**

Receipt and employee information is stored in an Azure SQL database.

**Documentation -**

Employees are provided with a getting started document when they first use the solution. The documentation includes details on supported operating systems for Azure File upload, and instructions on how to configure the mounted folder.

**Solution details -****Users table -**

Column	Description
UserId	unique identifier for an employee
ExpenseAccount	employees expense account number in the format 1234-123-1234
AllowedAmount	limit of allowed expenses before approval is needed
SupervisorId	unique identifier for employee's supervisor
SecurityPin	value used to validate user identity

**Web Application -**

You enable MSI for the Web App and configure the Web App to use the security principal name WebAppIdentity.

**Processing -**

Processing is performed by an Azure Function that uses version 2 of the Azure Function runtime. Once processing is completed, results are stored in Azure Blob Storage and an Azure SQL database. Then, an email summary is sent to the user with a link to the processing report. The link to the report must remain valid if the email is forwarded to another user.

**Logging -**

Azure Application Insights is used for telemetry and logging in both the processor and the web application. The processor also has TraceWriter logging enabled. Application Insights must always contain all log messages.

**Requirements -**

**Receipt processing -**

Concurrent processing of a receipt must be prevented.

**Disaster recovery -**

Regional outage must not impact application availability. All DR operations must not be dependent on application running and must ensure that data in the DR region is up to date.

**Security -**

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Developers report that the number of log messages in the trace output for the processor is too high, resulting in lost log messages.

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```
Processing.cs -  
PC01 public static class Processing  
PC02 {  
PC03     public static class Function  
PC04     {  
PC05         [FunctionName("IssueWork")]  
PC06         public static async Task Run([TimerTrigger("0 */5 * * *")] TimerInfo timer, ILogger  
log)  
PC07         {  
PC08             var container = await GetCloudBlobContainer();  
PC09             foreach (var fileItem in await ListFiles())  
PC10             {  
PC11                 var file = new CloudFile(fileItem.StorageUri.PrimaryUri);  
PC12                 var ms = new MemoryStream();  
PC13                 await file.DownloadToStreamAsync(ms);  
PC14                 var blob = container.GetBlockBlobReference(fileItem.Uri.ToString());  
PC15                 await blob.UploadFromStreamAsync(ms);  
PC16             }  
PC17         }  
PC18     }  
PC19     private static CloudBlockBlob GetDRBlockBlob(CloudBlockBlob sourceBlob)  
PC20     {  
PC21         . . .  
PC22     }  
PC23     private static async Task<CloudBlobContainer> GetCloudBlobContainer()  
PC24     {  
PC25         var cloudBlobClient = new CloudBlobClient(new Uri(". . ."), await GetCredentials());  
PC26         await cloudBlobClient.GetRootContainerReference().CreateIfNotExistsAsync();  
PC27         return cloudBlobClient.GetRootContainerReference();  
PC28     }  
PC29     private static async Task<StorageCredentials> GetCredentials()  
PC30     {  
PC31         . . .  
PC32     }  
PC33     private static async Task<List<IListFileItem>> ListFiles()  
PC34     {  
PC35         . . .  
PC36     }  
PC37     private KeyVaultClient _keyVaultClient = new KeyVaultClient(". . .");  
PC38 }  
PC39 }
```

Database.cs -

```
DB01 public class Database  
DB02 {  
DB03     private string ConnectionString =  
DB04     DB05     public async Task<object> LoadUserDetails(string userId)  
DB06     {  
DB07         DB08         return await policy.ExecuteAsync(async () =>  
DB09         {  
DB10             using (var connection = new SqlConnection(ConnectionString))
```

```
DB11     {
DB12         await connection.OpenAsync();
DB13         using (var command = new SqlCommand("...", connection))
DB14             using (var reader = command.ExecuteReader())
DB15             {
DB16                 ...
DB17             }
DB18         });
DB19     });
DB20 }
DB21 }
```

ReceiptUploader.cs -

```
RU01 public class ReceiptUploader
RU02 {
RU03     public async Task UploadFile(string file, byte[] binary)
RU04     {
RU05         var httpClient = new HttpClient();
RU06         var response = await httpClient.PutAsync("...", new ByteArrayContent(binary));
RU07         while (ShouldRetry(response))
RU08         {
RU09             response = await httpClient.PutAsync("...", new ByteArrayContent(binary));
RU10         }
RU11     }
RU12     private bool ShouldRetry(HttpStatusCode response)
RU13     {
RU14
RU15     }
RU16 }
```

ConfigureSSE.ps1 -

```
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CS02 $keyVault = Get-AzureRmKeyVault -VaultName "..."
CS03 $key = Get-AzureKeyVaultKey -VaultName $keyVault.VaultName -Name "..."
CS04 Set-AzureRmKeyVaultAccessPolicy ` 
CS05   -VaultName $keyVault.VaultName ` 
CS06   -ObjectId $storageAccount.Identity.PrincipalId ` 
CS07
CS08
CS09 Set-AzureRmStorageAccount ` 
CS10   -ResourceGroupName $storageAccount.ResourceGroupName ` 
CS11   -AccountName $storageAccount.StorageAccountName ` 
CS12   -EnableEncryptionService File ` 
CS13   -KeyvaultEncryption ` 
CS14   -KeyName $key.Name 
CS15   -KeyVersion $key.Version ` 
CS16   -KeyVaultUri $keyVault.VaultUri
```

**Question**

DRAG DROP -

You need to ensure disaster recovery requirements are met.

What code should you add at line PC16?

To answer, drag the appropriate code fragments to the correct locations. Each code fragment 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.

NOTE: Each correct selection is worth one point.

Select and Place:

Values	Answer Area
true	<code>var copyOptions = new CopyOptions { };</code>
SingleTransferContext	<code>var context = new Value</code>
ShouldTransferCallbackAsync	<code>= (source, destination) =&gt; Task.FromResult(true);</code>
false	<code>context. Value</code>
DirectoryTransferContext	<code>= (source, destination) =&gt; Task.FromResult(true);</code>
ShouldOverwriteCallbackAsync	<code>await TransferManager.CopyAsync(blob, GetDRBlob(blob), isServiceCopy: Value</code>
	<code>, context: context, options:copyOptions);</code>

**topic 27****Question #1****Topic 27****Introductory Info**

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**LabelMaker app -**

Coho Winery produces, bottles, and distributes a variety of wines globally. You are a developer implementing highly scalable and resilient applications to support online order processing by using Azure solutions.

Coho Winery has a LabelMaker application that prints labels for wine bottles. The application sends data to several printers. The application consists of five modules that run independently on virtual machines (VMs). Coho Winery plans to move the application to Azure and continue to support label creation.

External partners send data to the LabelMaker application to include artwork and text for custom label designs.

**Requirements. Data -**

You identify the following requirements for data management and manipulation:

Order data is stored as nonrelational JSON and must be queried using SQL.

Changes to the Order data must reflect immediately across all partitions. All reads to the Order data must fetch the most recent writes.

**Requirements. Security -**

You have the following security requirements:

Users of Coho Winery applications must be able to provide access to documents, resources, and applications to external partners.

External partners must use their own credentials and authenticate with their organization's identity management solution.

External partner logins must be audited monthly for application use by a user account administrator to maintain company compliance.

Storage of e-commerce application settings must be maintained in Azure Key Vault.

E-commerce application sign-ins must be secured by using Azure App Service authentication and Azure Active Directory (AAD).

Conditional access policies must be applied at the application level to protect company content.

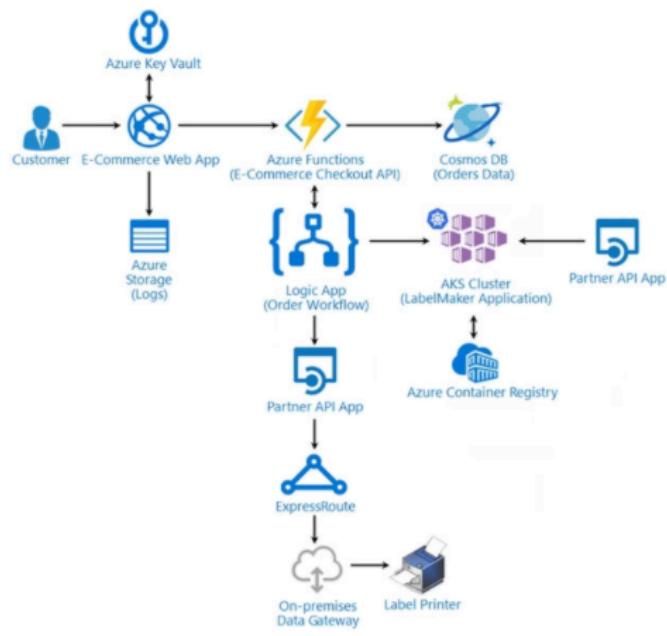
The LabelMaker application must be secured by using an AAD account that has full access to all namespaces of the Azure Kubernetes Service (AKS) cluster.

**Requirements. LabelMaker app -**

Azure Monitor Container Health must be used to monitor the performance of workloads that are deployed to Kubernetes environments and hosted on Azure Kubernetes Service (AKS).

You must use Azure Container Registry to publish images that support the AKS deployment.

Architecture -



Issues -

Calls to the Printer API App fail periodically due to printer communication timeouts.

Printer communication timeouts occur after 10 seconds. The label printer must only receive up to 5 attempts within one minute.

The order workflow fails to run upon initial deployment to Azure.

Order.json -

Relevant portions of the app files are shown below. Line numbers are included for reference only.  
This JSON file contains a representation of the data for an order that includes a single item.

Order.json -  
**Order.json**

```

01 {
02   "id" : 1,
03   "customers" : [
04     {
05       "familyName" : "Doe",
06       "givenName" : "John",
07       "customerid" : 5
08     }
09   ],
10   "line_items" : [
11     {
12       "fulfillable_quantity" : 1,
13       "id": 6,
14       "price" : "199.99" ,
15       "product_id" : 7513594,
16       "quantity": 1,

```

```
15     product_id : 75155994,
16     "quantity": 1,
17     "requires_shipping" : true ,
18     "sku": "SFC-342-N" ,
19     "title" : "Surface Go" ,
20     "vendor" : "Microsoft" ,
21     "name" : "Surface Go - 8GB" ,
22     "taxable" : true ,
23     "tax_lines" : [
24       {
25         "title" : "State Tax" ,
26         "price" : "3.98" ,
27         "rate" : 0.06
28       }
29     ],
30     "total_discount" : "5.00" ,
31     "discount_allocations" : [
32       {
33         "amount" : "5.00" ,
34         "discount_application_index" : 2
35       }
36     ]
```

#### Question

HOTSPOT -

You need to configure Azure Cosmos DB.

Which settings should you use? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.

Hot Area:

#### Answer Area

Setting	Value
Consistency Level	<div style="border: 1px solid #ccc; padding: 5px; width: 150px;"><p>Strong</p><p>Bounded-staleness</p><p>Session</p><p>Eventual</p></div>
API	<div style="border: 1px solid #ccc; padding: 5px; width: 150px;"><p>SQL</p><p>MongoDB</p><p>Graph</p><p>Table</p></div>

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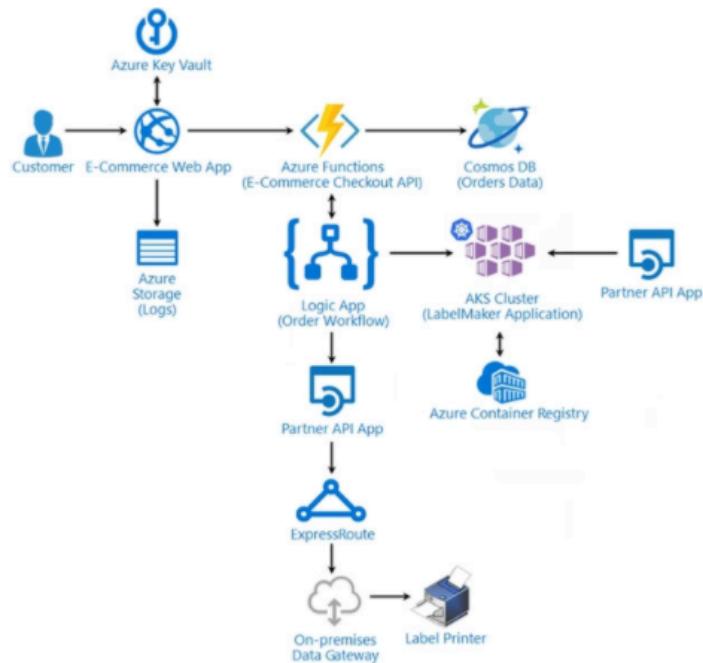
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07       "customerid" : 5
08     }
09   ],
10   "line_items" : [
11     {
12       "fulfillable_quantity" : 1,
13       "id": 6,
14       "price" : "199.99" ,
15       "product_id" : 7513594,

```

```
15     "product_id" : 7513594,  
16     "quantity": 1,  
17     "requires_shipping" : true ,  
18     "sku": "SFC-342-N" ,  
19     "title" : "Surface Go" ,  
20     "vendor" : "Microsoft" ,  
21     "name" : "Surface Go - 8GB" ,  
22     "taxable" : true ,  
23     "tax_lines" : [  
24         {  
25             "title" : "State Tax" ,  
26             "price" : "3.98" ,  
27             "rate" : 0.06  
28         }  
29     ],  
30     "total_discount" : "5.00" ,  
31     "discount_allocations" : [  
32         {  
33             "amount" : "5.00" ,  
34             "discount_application_index" : 2  
35         }  
36     ]
```

#### Question

HOTSPOT -

You need to retrieve all order line items from Order.json and sort the data alphabetically by the city.

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

NOTE: Each correct selection is worth one point.

Hot Area:

#### Answer Area

SELECT li.id AS lineitemid, li.price

FROM

Orders o
LineItems li

JOIN

li
o

IN

o.line_items
li.line_items
o.address

ORDER BY

ASC

o.address.city
li.address.city
o.city
li.city