AZ-400

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AZ-400

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Design a DevOps Strategy

Testlet 1

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 question 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. If the case study has an **All Information** tab, note that the information displayed is identical to the information displayed on the subsequent tabs. When you are ready to answer a question, click the **Question** button to return to the question. **Overview**

Litware, Inc. is an independent software vendor (ISV). Litware has a main office and five branch offices.

Existing Environment

Application Architecture

The company's primary application is a single monolithic retirement fund management system based on ASP.NET web forms that use logic written in VB.NET. Some new sections of the application are written in C#.

Variations of the application are created for individual customers. Currently, there are more than 80 live code branches in the application's code base.

The application was developed by using Microsoft Visual Studio. Source code is stored in Team Foundation Server (TFS) in the main office. The branch offices access the source code by using TFS proxy servers.

Architectural Issues

Litware focuses on writing new code for customers. No resources are provided to refactor or remove existing code. Changes to the code base take a long time, as dependencies are not obvious to individual developers.

Merge operations of the code often take months and involve many developers. Code merging frequently introduces bugs that are difficult to locate and resolve.

Customers report that ownership costs of the retirement fund management system increase continually. The need to merge unrelated code makes even minor code changes expensive.

Customers report that bug reporting is overly complex.

Requirements

Planned changes

Litware plans to develop a new suite of applications for investment planning. The investment planning applications will require only minor integration with the existing retirement fund management system.

The investment planning applications suite will include one multi-tier web application and two iOS mobile applications. One mobile application will be used by employees; the other will be used by customers.

Litware plans to move to a more agile development methodology. Shared code will be extracted into a series of packages.

Litware has started an internal cloud transformation process and plans to use cloud-based services whenever suitable.

Litware wants to become proactive in detecting failures, rather than always waiting for customer bug reports.

Technical requirements

The company's investment planning applications suite must meet the following requirements:

▪ New incoming connections through the firewall must be minimized.
▪ Members of a group named Developers must be able to install packages.
▪ The principle of least privilege must be used for all permission assignments.
▪ A branching strategy that supports developing new functionality in isolation must be used.
▪ Members of a group named Team Leaders must be able to create new packages and edit the permissions of package feeds.
▪ Visual Studio App Center must be used to centralize the reporting of mobile application crashes and device types in use.
▪ By default, all releases must remain available for 30 days, except for production releases, which must be kept for 60 days.
▪ By default, all App Center must be used to centralize the reporting of mobile application crashes and device types in use.

▪ Code quality and release quality are critical. During release, deployments must not proceed between stages if any active bugs are logged against the release. ▪ The mobile applications must be able to call the share pricing service of the existing retirement fund management system. Until the system is upgraded, the service will only support basic authentication over HTTPS.

▪ The required operating system configuration for the test servers changes weekly. Azure Automation State Configuration must be used to ensure that the operating system on each test server is configured the same way when the servers are created and checked periodically.

Current Technical Issue

The test servers are configured correctly when first deployed, but they experience configuration drift over time. Azure Automation State Configuration fails to correct the configurations.

Azure Automation State Configuration nodes are registered by using the following command.

```
Register-AzureRmAutomationDscNode
    -ResourceGroupName 'TestResourceGroup'
    -AutomationAccountName 'LitwareAutomationAccount'
    -AzureVMName $vname
    -ConfigurationMode 'ApplyOnly'
```

Design a DevOps Strategy

Question Set 2

QUESTION 1
Your company plans to use an agile approach to software development.

You need to recommend an application to provide communication between members of the development team who work in locations around the world. The applications must meet the following requirements:

▪ Provide the ability to isolate the members of different project teams into separate communication channels and to keep a history of the chats within those channels.
▪ Be available on Windows 10, Mac OS, iOS, and Android operating systems.
▪ Provide the ability to add external contractors and suppliers to projects.
▪ Integrate directly with Azure DevOps.

https://vceplus.com/ What should

you recommend?

A. Microsoft Project
B. Bamboo
C. Microsoft Lync
D. Microsoft Teams

Correct Answer: D
Section: (none)
Explanation

Explanation/Reference:
Explanation:

- Within each team, users can create different channels to organize their communications by topic. Each channel can include a couple of users or scale to thousands of users.
- Microsoft Teams works on Android, iOS, Mac and Windows systems and devices. It also works in Chrome, Firefox, Internet Explorer 11 and Microsoft Edge web browsers.
- The guest-access feature in Microsoft Teams allows users to invite people outside their organizations to join internal channels for messaging, meetings and file sharing. This capability helps to facilitate business-to-business project management.

- Teams integrates with Azure DevOps.

Note: Slack would also be a correct answer, but it is not an option here.

References: https://searchunifiedcommunications.techtarget.com/definition/Microsoft-Teams

QUESTION 2
You manage build pipelines and deployment pipelines by using Azure DevOps.

Your company has a team of 500 developers. New members are added continually to the team.

You need to automate the management of users and licenses whenever possible.

Which task must you perform manually?

A. modifying group memberships
B. adding users
C. assigning entitlements
D. procuring licenses

Correct Answer: D
Section: (none)
Explanation

Explanation/Reference:
Incorrect Answers:
A: You can seamlessly replace existing solutions with group-based licensing to more easily manage licenses in Azure DevOps. You can use Group rules.

C: Member Entitlement Management APIs allow managing Entitlements that include -
- License
- Extensions
- Project/Team memberships

QUESTION 3
You are developing a multi-tier application. The application will use Azure App Service web apps as the front end and an Azure SQL database as the back end. The application will use Azure functions to write some data to Azure Storage.

You need to send the Azure DevOps team an email message when the front end fails to return a status code of 200.

Which feature should you use?

A. Service Map in Azure Log Analytics
B. Availability tests in Azure Application Insights
C. Profiler in Azure Application Insights
D. Application Map in Azure Application Insights

Correct Answer: D
Section: (none)

Explanation

Explanation/Reference:
Explanation:
Application Map helps you spot performance bottlenecks or failure hotspots across all components of your distributed application. Each node on the map represents an application component or its dependencies; and has health KPI and alerts status.

Incorrect Answers:
A: Service Map automatically discovers application components on Windows and Linux systems and maps the communication between services. You can use it to view your servers as you think of them--interconnected systems that deliver critical services. Service Map shows connections between servers, processes, and ports across any TCP-connected architecture with no configuration required, other than installation of an agent. References: https://docs.microsoft.com/en-us/azure/azure-monitor/app/app-map

QUESTION 4
During a code review, you discover many quality issues. Many modules contain unused variables and empty catch blocks.

You need to recommend a solution to improve the quality of the code.

What should you recommend?

A. In a Grunt build task, select **Enabled** from Control Options.

B. In a Maven build task, select **Run PMD**.

C. In a Xcode build task, select **Use xcpretty** from Advanced.

D. In a Gradle build task, select **Run Checkstyle**.

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
PMD is a source code analyzer. It finds common programming flaws like unused variables, empty catch blocks, unnecessary object creation, and so forth.

There is an Apache Maven PMD Plugin which allows you to automatically run the PMD code analysis tool on your project's source code and generate a site report with its results.

Incorrect Answers:
C: xcpretty is a fast and flexible formatter for xcodebuild.

Reference: https://pmd.github.io/

QUESTION 5
Your company has an on-premises Bitbucket Server that is used for Git-based source control. The server is protected by a firewall that blocks inbound Internet traffic.

You plan to use Azure DevOps to manage the build and release processes.

Which two components are required to integrate Azure DevOps and Bitbucket? Each correct answer presents part of the solution.

NOTE: Each correct selection is worth one point.

A. a deployment group
B. a Microsoft-hosted agent
C. service hooks
D. a self-hosted agent
E. an External Git service connection

Correct Answer: DE
Section: (none)
Explanation

Explanation/Reference:
Explanation:
E: GitLab CI/CD can be used with GitHub or any other Git server such as BitBucket. Instead of moving your entire project to GitLab, you can connect your external repository to get the benefits of GitLab CI/CD.

Note: When a pipeline uses a remote, 3rd-party repository host such as Bitbucket Cloud, the repository is configured with webhooks that notify Azure Pipelines Server or TFS when code has changed and a build should be triggered. Since on-premises installations are normally protected behind a firewall, 3rd-party webhooks are unable to reach the on-premises server. As a workaround, you can use the External Git repository type which uses polling instead of webhooks to trigger a build when code has changed.

References: https://docs.microsoft.com/en-us/azure/devops/pipelines/repos/pipeline-options-for-git

QUESTION 6
Your company plans to use an agile approach to software development.

You need to recommend an application to provide communication between members of the development team who work in locations around the world. The applications must meet the following requirements:

▪ Provide the ability to isolate the members of different project teams into separate communication channels and to keep a history of the chats within those channels.
▪ Be available on Windows 10, Mac OS, iOS, and Android operating systems.
▪ Provide the ability to add external contractors and suppliers to projects. ▪
Integrate directly with Azure DevOps.

What should you recommend?

A. Skype for Business
B. Bamboo
C. Octopus
D. Slack

Correct Answer: D
Section: (none)
Explanation

Explanation/Reference:

Explanation:
Slack is a popular team collaboration service that helps teams be more productive by keeping all communications in one place and easily searchable from virtually anywhere. All your messages, your files, and everything from Twitter, Dropbox, Google Docs, Azure DevOps, and more all together. Slack also has fully native apps for iOS and Android to give you the full functionality of Slack wherever you go. Integrated with Azure DevOps
This integration keeps your team informed of activity happening in its Azure DevOps projects. With this integration, code check-ins, pull requests, work item updates, and build events show up directly in your team's Slack channel.

Note: Microsoft Teams would also be a correct answer, but it is not an option here.

Reference:

https://marketplace.visualstudio.com/items?itemName=ms-vsts.vss-services-slack

QUESTION 7
Your development team is building a new web solution by using the Microsoft Visual Studio integrated development environment (IDE).

You need to make a custom package available to all the developers. The package must be managed centrally, and the latest version must be available for consumption in Visual Studio automatically.

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

NOTE: Each correct selection is worth one point.

A. Publish the package to a feed.
B. Create a new feed in Azure Artifacts.
C. Upload a package to a Git repository.
D. Add the package URL to the Environment settings in Visual Studio.
E. Add the package URL to the NuGet Package Manager settings in Visual Studio.
F. Create a Git repository in Azure Repos.

Correct Answer: ABE
Section: (none)
Explanation

Explanation/Reference:
Explanation:
B: By using your custom NuGet package feed within your Azure DevOps (previously VSTS) instance, you'll be able to distribute your packages within your organization with ease.
Start by creating a new feed.

A: We can publish, pack and push the built project to our NuGet feed.

E: Consume your private NuGet Feed
Go back to the Packages area in Azure DevOps, select your feed and hit "Connect to feed". You'll see some instructions for your feed, but it's fairly simple to set up.

Just copy your package source URL, go to Visual Studio, open the NuGet Package Manager, go to its settings and add a new source. Choose a fancy name, insert the source URL. Done.

Search for your package in the NuGet Package Manager and it should appear there, ready for installation. Make sure to select the appropriate feed (or just all feeds) from the top right select box.

References:

https://medium.com/medialesson/get-started-with-private-nuget-feeds-in-azure-devops-8c7b5f022a68

QUESTION 8
You have a GitHub repository.

You create a new repository in Azure DevOps.

You need to recommend a procedure to clone the repository from GitHub to Azure DevOps.

What should you recommend?

A. Create a pull request.
B. Create a webhook.
C. Create a service connection for GitHub.
D. From Import a Git repository, click **Import**.
E. Create a personal access token in Azure DevOps.

Correct Answer: D
Section: (none)
Explanation

Explanation/Reference:
Explanation:
You can import an existing Git repo from GitHub, Bitbucket, GitLab, or other location into a new or empty existing repo in your project in Azure DevOps.

Import into a new repo

1. Select Repos, Files.
2. From the repo drop-down, select Import repository.
3. If the source repo is publicly available, just enter the clone URL of the source repository and a name for your new Git repository.

References: https://docs.microsoft.com/en-us/azure/devops/repos/git/import-git-repository?view=azure-devops

QUESTION 9
Your company is concerned that when developers introduce open source libraries, it creates licensing compliance issues.

You need to add an automated process to the build pipeline to detect when common open source libraries are added to the code base.

What should you use?

A. OWASP ZAP

B. Jenkins
C. Code Style
D. WhiteSource Bolt

Correct Answer: D
Section: (none)
Explanation

Explanation/Reference:
Explanation:
WhiteSource provides WhiteSource Bolt, a lightweight open source security and management solution developed specifically for integration with Azure DevOps and Azure DevOps Server.

Note: WhiteSource is the leader in continuous open source software security and compliance management. WhiteSource integrates into your build process, irrespective of your programming languages, build tools, or development environments. It works automatically, continuously, and silently in the background, checking the security, licensing, and quality of your open source components against WhiteSource constantly-updated definitive database of open source repositories.

Reference:
https://www.azuredevopslabs.com/labs/vstsextend/whitesource/

QUESTION 10
You plan to use a NuGet package in a project in Azure DevOps. The NuGet package is in a feed that requires authentication.

You need to ensure that the project can restore the NuGet package automatically.

What should the project use to automate the authentication?

A. an Azure Automation account
B. an Azure Artifacts Credential Provider
C. an Azure Active Directory (Azure AD) account that has multi-factor authentication (MFA) enabled
D. an Azure Active Directory (Azure AD) service principal

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
The Azure Artifacts Credential Provider automates the acquisition of credentials needed to restore NuGet packages as part of your .NET development workflow. It integrates with MSBuild, dotnet, and NuGet(.exe) and works on Windows, Mac, and Linux. Any time you want to use packages from an Azure Artifacts feed, the Credential Provider will automatically acquire and securely store a token on behalf of the NuGet client you're using.

Reference:
https://github.com/Microsoft/artifacts-credprovider

QUESTION 11
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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The lead developer at your company reports that adding new application features takes longer than expected due to a large accumulated technical debt.

You need to recommend changes to reduce the accumulated technical debt.

Solution: You recommend increasing the code duplication.

Does this meet the goal?

A. Yes
B. No

Correct Answer: B

Section: (none)
Explanation

Explanation/Reference:
Explanation:
Instead reduce the code complexity.

Reference:
https://dzone.com/articles/fight-through-the-pain-how-to-deal-with-technical

QUESTION 12
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The lead developer at your company reports that adding new application features takes longer than expected due to a large accumulated technical debt.

You need to recommend changes to reduce the accumulated technical debt.

Solution: You recommend increasing the test coverage.

Does this meet the goal?

A. Yes
B. No

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Instead reduce the code complexity.

Reference:
https://dzone.com/articles/fight-through-the-pain-how-to-deal-with-technical

QUESTION 13

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The lead developer at your company reports that adding new application features takes longer than expected due to a large accumulated technical debt.

You need to recommend changes to reduce the accumulated technical debt.

Solution: You recommend reducing the code complexity.

Does this meet the goal?

A. Yes
B. No

Correct Answer: A
Section: (none)
Explanation
Explanation/Reference:
Reference:
https://dzone.com/articles/fight-through-the-pain-how-to-deal-with-technical

QUESTION 14
Your company has 60 developers who are assigned to four teams. Each team has 15 members.

The company uses an agile development methodology.

You need to structure the work of the development teams so that each team owns their respective work while working together to reach a common goal.

Which parts of the taxonomy should you enable the team to perform autonomously?

A. Features and Tasks
B. Initiatives and Epics
C. Epics and Features
D. Stories and Tasks

Correct Answer: A
Section: (none)
Explanation

Explanation/Reference:
Explanation:
A feature typically represents a shippable component of software.

Features, examples:
▪ Add view options to the new work hub
▪ Add mobile shopping cart
▪ Support text alerts
▪ Refresh the web portal with new look and feel

User Stories and Tasks are used to track work. Teams can choose how they track bugs, either as requirements or as tasks

Incorrect Answers:
B, C: An epic represents a business initiative to be accomplished.
Epics, examples:
▪ Increase customer engagement
▪ Improve and simplify the user experience
▪ Implement new architecture to improve performance ▪
Engineer the application to support future growth ▪ Support
integration with external services ▪ Support mobile apps

Reference:
https://docs.microsoft.com/en-us/azure/devops/boards/backlogs/define-features-epics https://docs.microsoft.com/en-

us/azure/devops/boards/work-items/about-work-items

QUESTION 15
You store source code in a Git repository in Azure repos. You use a third-party continuous integration (CI) tool to control builds.

What will Azure DevOps use to authenticate with the tool?

A. certificate authentication
B. a personal access token (PAT)
C. a Shared Access Signature (SAS) token
D. NTLM authentication

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Personal access tokens (PATs) give you access to Azure DevOps and Team Foundation Server (TFS), without using your username and password directly.

Reference:
https://docs.microsoft.com/en-us/azure/devops/repos/git/auth-overview

QUESTION 16
During a code review, you discover quality issues in a Java application.

You need to recommend a solution to detect quality issues including unused variables and empty catch blocks.

What should you recommend?

A. In a Maven build task, select `Run PMD`.

B. In an Xcode build task, select **Use xcpretty** from Advanced.

C. In a Gulp build task, specify a custom condition expression.

D. In a Grunt build task, select **Enabled** from Control Options.

Correct Answer: A
Section: (none)
Explanation

Explanation/Reference:
Explanation:
PMD is a source code analyzer. It finds common programming flaws like unused variables, empty catch blocks, unnecessary object creation, and so forth.

There is an Apache Maven PMD Plugin which allows you to automatically run the PMD code analysis tool on your project's source code and generate a site report with its results.

Incorrect Answers:
B: xcpretty is a fast and flexible formatter for xcodebuild.

Reference:
https://pmd.github.io/

QUESTION 17
Your company creates a new Azure DevOps team.

You plan to use Azure DevOps for sprint planning.

You need to visualize the flow of your work by using an agile methodology.

Which Azure DevOps component should you use?

A. Kanban boards
B. sprint planning
C. delivery plans
D. portfolio backlogs

Correct Answer: A
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Customizing Kanban boards
To maximize a team's ability to consistently deliver high quality software, Kanban emphasize two main practices. The first, visualize the flow of work, requires you to map your team's workflow stages and configure your Kanban board to match. Your Kanban board turns your backlog into an interactive signboard, providing a visual flow of work.

Reference:
https://azuredevopslabs.com/labs/azuredevops/agile/

QUESTION 18
You use Azure Artifacts to host NuGet packages that you create.

You need to make one of the packages available to anonymous users outside your organization. The solution must minimize the number of publication points.

What should you do?

A. Change the feed URL of the package
B. Create a new feed for the package
C. Promote the package to a release view.
D. Publish the package to a public NuGet repository.

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Azure Artifacts introduces the concept of multiple feeds that you can use to organize and control access to your packages.
Packages you host in Azure Artifacts are stored in a feed. Setting permissions on the feed allows you to share your packages with as many or as few people as your scenario requires.
Feeds have four levels of access: Owners, Contributors, Collaborators, and Readers.

Reference: https://docs.microsoft.com/en-us/azure/devops/artifacts/feeds/feed-permissions?view=vsts&tabs=new-nav

QUESTION 19
Your company implements an Agile development methodology.

You plan to implement retrospectives at the end of each sprint.

Which three questions should you include? Each correct answer presents part of the solution.

NOTE: Each correct selection is worth one point.

A. Who performed well?
B. Who should have performed better?

C. What could have gone better?
D. What went well?
E. What should we try next?

Correct Answer: BCE
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Sprint retrospective meetings
The sprint retrospective meeting typically occurs on the last day of the sprint, after the sprint review meeting. In this meeting, your team explores its execution of Scrum and what might need tweaking.

Based on discussions, your team might decide to change one or more processes to improve its own effectiveness, productivity, quality, and satisfaction. This meeting and the resulting improvements are critical to the agile principle of self-organization.

Look to address these areas during your team sprint retrospectives:
▪ Issues that affected your team's general effectiveness, productivity, and quality.

▪ Elements that impacted your team's overall satisfaction and project flow.
▪ What happened to cause incomplete backlog items? What actions will the team take to prevent these issues in the future?

Reference:
https://docs.microsoft.com/en-us/azure/devops/boards/sprints/best-practices-scrum

QUESTION 20
You use Azure Pipelines to manage project builds and deployments.

You plan to use Azure Pipelines for Microsoft Teams to notify the legal team when a new build is ready for release.

You need to configure the Organization Settings in Azure DevOps to support Azure Pipelines for Microsoft Teams.

What should you turn on?

A. Third-party application access via OAuth
B. Azure Active Directory Conditional Access Policy Validation
C. Alternate authentication credentials
D. SSH authentication

Correct Answer: A
Section: (none)
Explanation

Explanation/Reference:
Explanation:
The Azure Pipelines app uses the OAuth authentication protocol, and requires Third-party application access via OAuth for the organization to be enabled. To enable this setting, navigate to Organization Settings > Security > Policies, and set the Third-party application access via OAuth for the organization setting to On.

Reference:
https://docs.microsoft.com/en-us/azure/devops/pipelines/integrations/microsoft-teams

QUESTION 21
Your company uses Azure Artifacts for package management.

You need to configure an upstream source in Azure Artifacts for Python packages.

Which repository type should you use as an upstream source?

A. npmjs.org
B. PyPI

C. Maven Central
D. third-party trusted Python

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Get started with Python packages in Azure Artifacts

Create a feed
1. Select Artifacts (in the left navigation of your Azure DevOps project).
2. On the Artifacts page, select Create Feed.
3. In the Create new feed dialog box:

4. In the Name field, give the feed a name.

PyPI is the default repository name for twine, which is a tool for publishing Python packages.

Reference:
https://docs.microsoft.com/en-us/azure/devops/artifacts/quickstarts/python-packages

Implement DevOps Development Processes

Testlet 1

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- By default, all releases must remain available for 30 days, except for production releases, which must be kept for 60 days.
- By default, all App Center must be used to centralize the reporting of mobile application crashes and device types in use.
- Code quality and release quality are critical. During release, deployments must not proceed between stages if any active bugs are logged against the release. •
The mobile applications must be able to call the share pricing service of the existing retirement fund management system. Until the system is upgraded, the service will only support basic authentication over HTTPS.
- The required operating system configuration for the test servers changes weekly. Azure Automation State Configuration must be used to ensure that the operating system on each test server is configured the same way when the servers are created and checked periodically.

Current Technical Issue

The test servers are configured correctly when first deployed, but they experience configuration drift over time. Azure Automation State Configuration fails to correct the configurations.

Azure Automation State Configuration nodes are registered by using the following command.

```
Register-AzureRmAutomationDscNode
  -ResourceGroupName 'TestResourceGroup'
  -AutomationAccountName 'LitwareAutomationAccount'
  -AzureVMName $vname
  -ConfigurationMode 'ApplyOnly'
```

QUESTION 1

To resolve the current technical issue, what should you do to the `Register-AzureRmAutomationDscNode` command?

A. Change the value of the *ConfigurationMode* parameter.
B. Replace the `Register-AzureRmAutomationDscNode` cmdlet with `Register-AzureRmAutomationScheduledRunbook`
C. Add the *AllowModuleOverwrite* parameter.
D. Add the *DefaultProfile* parameter.

Correct Answer: A
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Change the ConfigurationMode parameter from ApplyOnly to ApplyAndAutocorrect.

The Register-AzureRmAutomationDscNode cmdlet registers an Azure virtual machine as an APS Desired State Configuration (DSC) node in an Azure Automation account.

Scenario: Current Technical Issue

The test servers are configured correctly when first deployed, but they experience configuration drift over time. Azure Automation State Configuration fails to correct the configurations.

Azure Automation State Configuration nodes are registered by using the following command.

```
Register-AzureRmAutomationDscNode
    -ResourceGroupName 'TestResourceGroup'
    -AutomationAccountName 'LitwareAutomationAccount'
    -AzureVMName $vmanme
    -ConfigurationMode 'ApplyOnly'
```

References: https://docs.microsoft.com/en-us/powershell/module/azurerm.automation/register-azurermautomationdscnode?view=azurermps-6.13.0

QUESTION 2
Which branching strategy should you recommend for the investment planning applications suite?

A. release isolation
B. main only
C. development isolation
D. feature isolation

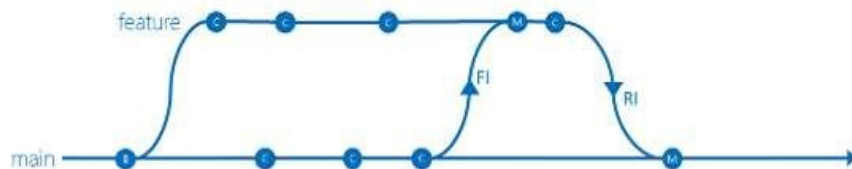**Correct Answer:** D
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Scenario: A branching strategy that supports developing new functionality in isolation must be used.

Feature isolation is a special derivation of the development isolation, allowing you to branch one or more feature branches from main, as shown, or from your dev branches.

When you need to work on a particular feature, it might be a good idea to create a feature branch.

Incorrect Answers:

A: Release isolation introduces one or more release branches from main. The strategy allows concurrent release management, multiple and parallel releases, and codebase snapshots at release time.

B: The Main Only strategy can be folder-based or with the main folder converted to a Branch, to enable additional visibility features. You commit your changes to the main branch and optionally indicate development and release milestones with labels.

C: Development isolation: When you need to maintain and protect a stable main branch, you can branch one or more dev branches from main. It enables isolation and concurrent development. Work can be isolated in development branches by feature, organization, or temporary collaboration.

References:
https://docs.microsoft.com/en-us/azure/devops/repos/tfvc/branching-strategies-with-tfvc?view=azure-devops

Implement DevOps Development Processes

Testlet 2

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 question 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. If the case study has an **All Information** tab, note that the information displayed is identical to the information displayed on the subsequent tabs. When you are ready to answer a question, click the **Question** button to return to the question. **Overview**

Contoso, Ltd. is a manufacturing company that has a main office in Chicago.

Existing Environment

Contoso plans to improve its IT development and operations processes by implementing Azure DevOps principles. Contoso has an Azure subscription and creates an Azure DevOps organization.

The Azure DevOps organization includes:

▪ The Docker extension
▪ A deployment pool named Pool7 that contains 10 Azure virtual machines that run Windows Server 2016

The Azure subscription contains an Azure Automation account.

Requirements

Planned changes
Contoso plans to create projects in Azure DevOps as shown in the following table.

Project name	Project details
Project 1	Project1 will provide support for incremental builds and third-party SDK components
Project 2	Project2 will use an automatic build policy. A small team of developers named Team2 will work independently on changes to the project. The Team2 members will not have permissions to Project2.
Project 3	Project3 will be integrated with SonarQube
Project 4	Project4 will provide support for a build pipeline that creates a Docker image and pushes the image to the Azure Container Registry. Project4 will use an existing Dockerfile.
Project 5	Project5 will contain a Git repository in Azure Repos and a continuous integration trigger that will initiate a build in response to any change except for changes within /folder1 of the repository.
Project 6	Project6 will provide support for build and deployment pipelines. Deployment will be allowed only if the number of current work items representing active software bugs is 0.
Project 7	Project7 will contain a target deployment group named Group7 that maps to Pool7. Project7 will use Azure Automation State Configuration to maintain the desired state of the computers in Group7.

Technical requirements

Contoso identifies the following technical requirements:

▪ Implement build agents for Project1.
▪ Whenever possible, use Azure resources.
▪ Avoid using deprecated technologies.
▪ Implement a code flow strategy for Project2 that will:
> -Enable Team2 to submit pull requests for Project2.
> -Enable Team2 to work independently on changes to a copy of Project2.
> -Ensure that any intermediary changes performed by Team2 on a copy of Project2 will be subject to the same restrictions as the ones defined in the build policy of Project2.
▪ Whenever possible, implement automation and minimize administrative effort.
▪ Implement Project3, Project5, Project6, and Project7 based on the planned changes.
▪ Implement Project4 and configure the project to push Docker images to Azure Container Registry.

QUESTION 1
You add the virtual machines as managed nodes in Azure Automation State Configuration.

You need to configure the managed computers in Pool7.

What should you do next?

A. Modify the **RefreshMode** property of the Local Configuration Manager (LCM).

B. Run the `Register-AzureRmAutomationDscNode` Azure Powershell cmdlet.

C. Modify the **ConfigurationMode** property of the Local Configuration Manager (LCM).

D. Install PowerShell Core.

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
The Register-AzureRmAutomationDscNode cmdlet registers an Azure virtual machine as an APS Desired State Configuration (DSC) node in an Azure Automation account.

Scenario: The Azure DevOps organization includes:
The Docker extension
A deployment pool named Pool7 that contains 10 Azure virtual machines that run Windows Server 2016

Project 7	Project7 will contain a target deployment group named Group7 that maps to Pool7. Project7 will use Azure Automation State Configuration to maintain the desired state of the computers in Group7.

References: https://docs.microsoft.com/en-us/powershell/module/azurerm.automation/register-azurermautomationdscnode

Implement DevOps Development Processes

Question Set 3

QUESTION 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 integrate a cloud-hosted Jenkins server and a new Azure DevOps deployment.

You need Azure DevOps to send a notification to Jenkins when a developer commits changes to a branch in Azure Repos.

Solution: You add a trigger to the build pipeline.

Does this meet the goal?

A. Yes
B. No

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
You can create a service hook for Azure DevOps Services and TFS with Jenkins.

References: https://docs.microsoft.com/en-us/azure/devops/service-hooks/services/jenkins

QUESTION 2
You are automating the build process for a Java-based application by using Azure DevOps.

You need to add code coverage testing and publish the outcomes to the pipeline.

What should you use?

A. Cobertura
B. Bullseye Coverage

C. MSTest
D. Coverlet
E. NUnit
F. Coverage.py

Correct Answer: A
Section: (none)
Explanation

Explanation/Reference:
Explanation:

Use Publish Code Coverage Results task in a build pipeline to publish code coverage results to Azure Pipelines or TFS, which were produced by a build in Cobertura or JaCoCo format.

Incorrect:
Not B: Bullseye Coverage is used for C++ code, and not for Java.

Not D: If you're building on Linux or macOS, you can use Coverlet or a similar tool to collect code coverage metrics. Code coverage results can be published to the server by using the Publish Code Coverage Results task. To leverage this functionality, the coverage tool must be configured to generate results in Cobertura or JaCoCo coverage format.

Not F: Coverage.py is used for Python, not for Java.

Reference: https://docs.microsoft.com/en-us/azure/devops/pipelines/tasks/test/publish-code-coverage-results

QUESTION 3
Your company uses Azure DevOps.

Only users who have accounts in Azure Active Directory can access the Azure DevOps environment.

You need to ensure that only devices that are connected to the on-premises network can access the Azure DevOps environment.

What should you do?

A. Assign the Stakeholder access level to all users.
B. In Azure Active Directory, configure risky sign-ins.
C. In Azure DevOps, configure Security in Project Settings.
D. In Azure Active Directory, configure conditional access.

Correct Answer: D
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Conditional Access is a capability of Azure Active Directory. With Conditional Access, you can implement automated access control decisions for accessing your cloud apps that are based on conditions.

Conditional Access policies are enforced after the first-factor authentication has been completed.

QUESTION 4
You are automating the testing process for your company.

You need to automate UI testing of a web application.

Which framework should you use?

A. JaCoco
B. Selenium
C. Xamarin.UITest
D. Microsoft.CodeAnalysis

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Performing user interface (UI) testing as part of the release pipeline is a great way of detecting unexpected changes, and need not be difficult. Selenium can be used to test your website during a continuous deployment release and test automation.

References: https://docs.microsoft.com/en-us/azure/devops/pipelines/test/continuous-test-selenium?view=azure-devops

QUESTION 5
You have an Azure DevOps organization named Contoso, an Azure DevOps project named Project1, an Azure subscription named Sub1, and an Azure key vault named vault1.

You need to ensure that you can reference the values of the secrets stored in vault1 in all the pipelines of Project1. The solution must prevent the values from being stored in the pipelines.

What should you do?

A. Create a variable group in Project1.
B. Add a secure file to Project1.
C. Modify the security settings of the pipelines.

D. Configure the security policy of Contoso.

Correct Answer: A
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Use a variable group to store values that you want to control and make available across multiple pipelines.

References: https://docs.microsoft.com/en-us/azure/devops/pipelines/library/variable-groups

QUESTION 6
Your team uses an agile development approach.

You need to recommend a branching strategy for the team's Git repository. The strategy must meet the following requirements.

▪ Provide the ability to work on multiple independent tasks in parallel.
▪ Ensure that checked-in code remains in a releasable state always.
▪ Ensure that new features can be abandoned at any time. ▪
Encourage experimentation.

What should you recommend?

A. a single long-running branch without forking
B. multiple long-running branches
C. a single fork per team member
D. a single long-running branch with multiple short-lived feature branches

Correct Answer: D
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Topic/feature branches, however, are useful in projects of any size. A topic branch is a short-lived branch that you create and use for a single particular feature or related work. This is something you've likely never done with a VCS before because it's generally too expensive to create and merge branches. But in Git it's common to create, work on, merge, and delete branches several times a day.

Reference: https://git-scm.com/book/en/v2/Git-Branching-Branching-Workflows

QUESTION 7
Your company has a project in Azure DevOps for a new web application.

The company identifies security as one of the highest priorities.

You need to recommend a solution to minimize the likelihood that infrastructure credentials will be leaked.

What should you recommend?

A. Add a Run Inline Azure PowerShell task to the pipeline.
B. Add a PowerShell task to the pipeline and run Set-AzureKeyVaultSecret.
C. Add a Azure Key Vault task to the pipeline.
D. Add Azure Key Vault references to Azure Resource Manger templates.

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Azure Key Vault provides a way to securely store credentials and other keys and secrets.
The Set-AzureKeyVaultSecret cmdlet creates or updates a secret in a key vault in Azure Key Vault.

References: https://docs.microsoft.com/en-us/powershell/module/azurerm.keyvault/set-azurekeyvaultsecret

QUESTION 8
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 need to recommend an integration strategy for the build process of a Java application. The solution must meet the following requirements:

▪ The builds must access an on-premises dependency management system.
▪ The build outputs must be stored as Server artifacts in Azure DevOps. ▪
The source code must be stored in a Git repository in Azure DevOps.

Solution: Configure an Octopus Tentacle on an on-premises machine. Use the Package Application task in the build pipeline.

Does this meet the goal?

A. Yes
B. No

Correct Answer: A
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Octopus Deploy is an automated deployment server that makes it easy to automate deployment of ASP.NET web applications, Java applications, NodeJS application and custom scripts to multiple environments.

Octopus can be installed on various platforms including Windows, Mac and Linux. It can also be integrated with most version control tools including VSTS and GIT.

When you deploy software to Windows servers, you need to install Tentacle, a lightweight agent service, on your Windows servers so they can communicate with the Octopus server.

When defining your deployment process, the most common step type will be a package step. This step deploys your packaged application onto one or more deployment targets.

When deploying a package you will need to select the machine role that the package will be deployed to.

References: https://octopus.com/docs/deployment-examples/package-deployments

https://explore.emtecinc.com/blog/octopus-for-automated-deployment-in-devops-

models

QUESTION 9
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 need to recommend an integration strategy for the build process of a Java application. The solution must meet the following requirements:

▪ The builds must access an on-premises dependency management system.

▪ The build outputs must be stored as Server artifacts in Azure DevOps. ▪
The source code must be stored in a Git repository in Azure DevOps.

Solution: Install and configure a self-hosted build agent on an on-premises machine. Configure the build pipeline to use the Default agent pool. Include the Java Tool Installer task in the build pipeline.

Does this meet the goal?

A. Yes
B. No

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Instead use Octopus Tentacle.

References: https://explore.emtecinc.com/blog/octopus-for-automated-deployment-in-devops-models

QUESTION 10
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 need to recommend an integration strategy for the build process of a Java application. The solution must meet the following requirements:

▪ The builds must access an on-premises dependency management system.
▪ The build outputs must be stored as Server artifacts in Azure DevOps. ▪
The source code must be stored in a Git repository in Azure DevOps.

Solution: Configure the build pipeline to use a Hosted VS 2019 agent pool. Include the Java Tool Installer task in the build pipeline.

Does this meet the goal?

A. Yes
B. No

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Instead use Octopus Tentacle.

References: https://explore.emtecinc.com/blog/octopus-for-automated-deployment-in-devops-models

QUESTION 11
You are designing the development process for your company.

You need to recommend a solution for continuous inspection of the company's code base to locate common code patterns that are known to be problematic.

What should you include in the recommendation?

A. Microsoft Visual Studio test plans
B. Gradle wrapper scripts
C. SonarCloud analysis
D. the JavaScript task runner

Correct Answer: C
Section: (none)
Explanation

Explanation/Reference:
Explanation:
SonarCloud is a cloud service offered by SonarSource and based on SonarQube. SonarQube is a widely adopted open source platform to inspect continuously the quality of source code and detect bugs, vulnerabilities and code smells in more than 20 different languages.

Note: The SonarCloud Azure DevOps extension brings everything you need to have your projects analyzed on SonarCloud very quickly.

Incorrect Answers:

A: Test plans are used to group together test suites and individual test cases. This includes static test suites, requirement-based suites, and query-based suites.

References: https://docs.travis-

ci.com/user/sonarcloud/

https://sonarcloud.io/documentation/integrations/vsts/

QUESTION 12
Your company builds a multi-tier web application.

You use Azure DevOps and host the production application on Azure virtual machines.

Your team prepares an Azure Resource Manager template of the virtual machine that you will use to test new features.

You need to create a staging environment in Azure that meets the following requirements:

▪ Minimizes the cost of Azure hosting
▪ Provisions the virtual machines automatically
▪ Uses the custom Azure Resource Manager template to provision the virtual machines What

should you do?

A. In Azure Cloud Shell, run Azure CLI commands to create and delete the new virtual machines in a staging resource group.
B. In Azure DevOps, configure new tasks in the release pipeline to deploy to Azure Cloud Services.
C. From Azure Cloud Shell, run Azure PowerShell commands to create and delete the new virtual machines in a staging resource group.
D. In Azure DevOps, configure new tasks in the release pipeline to create and delete the virtual machines in Azure DevTest Labs.

Correct Answer: D
Section: (none)
Explanation

Explanation/Reference:
Explanation:
You can use the Azure DevTest Labs Tasks extension that's installed in Azure DevOps to easily integrate your CI/CD build-and-release pipeline with Azure DevTest Labs. The extension installs three tasks: ▪ Create a VM
▪ Create a custom image from a VM ▪
Delete a VM

The process makes it easy to, for example, quickly deploy a "golden image" for a specific test task and then delete it when the test is finished.

References: https://docs.microsoft.com/en-us/azure/lab-services/devtest-lab-integrate-ci-cd-vsts

QUESTION 13
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 need to recommend an integration strategy for the build process of a Java application. The solution must meet the following requirements:

▪ The builds must access an on-premises dependency management system.
▪ The build outputs must be stored as Server artifacts in Azure DevOps. ▪
The source code must be stored in a Git repository in Azure DevOps.

Solution: Configure the build pipeline to use a Hosted Ubuntu agent pool. Include the Java Tool Installer task in the build pipeline.

Does this meet the goal?

A. Yes
B. No

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Instead use Octopus Tentacle.

Reference: https://explore.emtecinc.com/blog/octopus-for-automated-deployment-in-devops-models

QUESTION 14
Note: This question is part of a series of questions that present the same scenario. Each question in the series contains a unique solution that might meet the stated goals. Some question sets might have more than one correct solution, while others might not have a correct solution.

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

You integrate a cloud-hosted Jenkins server and a new Azure DevOps deployment.

You need Azure DevOps to send a notification to Jenkins when a developer commits changes to a branch in Azure Repos.

Solution: You create a service hook subscription that uses the build completed event.

Does this meet the goal?

A. Yes
B. No

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
You can create a service hook for Azure DevOps Services and TFS with Jenkins.
However, the service subscription event should use the code pushed event, is triggered when the code is pushed to a Git repository.

QUESTION 15
You create a Microsoft ASP.NET Core application.

You plan to use Azure Key Vault to provide secrets to the application as configuration data.

You need to create a Key Vault access policy to assign secret permissions to the application. The solution must use the principle of least privilege.

Which secret permissions should you use?

A. List only
B. Get only
C. Get and List

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Application data plane permissions:
▪ Keys: sign

▪ Secrets: get Reference:

https://docs.microsoft.co

m/en-us/azure/key-

vault/key-vault-secure-

your-key-vault

QUESTION 16
You have a branch policy in a project in Azure DevOps. The policy requires that code always builds successfully.

You need to ensure that a specific user can always merge changes to the master branch, even if the code fails to compile. The solution must use the principle of least privilege.

What should you do?

A. Add the user to the Build Administrators group.
B. Add the user to the Project Administrators group.
C. From the Security settings of the repository, modify the access control for the user.
D. From the Security settings of the branch, modify the access control for the user.

Correct Answer: D
Section: (none)
Explanation

Explanation/Reference:
Explanation:
In some cases, you need to bypass policy requirements so you can push changes to the branch directly or complete a pull request even if branch policies are not satisfied. For these situations, grant the desired permission from the previous list to a user or group. You can scope this permission to an entire project, a repo, or a single branch. Manage this permission along the with other Git permissions.

References: https://docs.microsoft.com/en-us/azure/devops/repos/git/branch-policies

QUESTION 17
Your company uses a Git repository in Azure Repos to manage the source code of a web application. The master branch is protected from direct updates. Developers work on new features in the topic branches.

Because of the high volume of requested features, it is difficult to follow the history of the changes to the master branch.

You need to enforce a pull request merge strategy. The strategy must meet the following requirements:

▪ Consolidate commit histories.
▪ Merge the changes into a single commit.

Which merge strategy should you use in the branch policy?

A. squash merge

B. fast-forward merge
C. Git fetch
D. no-fast-forward merge

Correct Answer: A
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Squash merging is a merge option that allows you to condense the Git history of topic branches when you complete a pull request. Instead of each commit on the topic branch being added to the history of the default branch, a squash merge takes all the file changes and adds them to a single new commit on the default branch.

A simple way to think about this is that squash merge gives you just the file changes, and a regular merge gives you the file changes and the commit history.

Note: Squash merging keeps your default branch histories clean and easy to follow without demanding any workflow changes on your team. Contributors to the topic branch work how they want in the topic branch, and the default branches keep a linear history through the use of squash merges. The commit history of a master branch updated with squash merges will have one commit for each merged branch. You can step through this history commit by commit to find out exactly when work was done.

References: https://docs.microsoft.com/en-us/azure/devops/repos/git/merging-with-squash

QUESTION 18
Your company uses cloud-hosted Jenkins for builds.

You need to ensure that Jenkins can retrieve source code from Azure Repos.

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

NOTE: Each correct selection is worth one point.

A. Create a webhook in Jenkins.

B. Add the **Team Foundation Server (TFS)** plug-in to Jenkins.

C. Add a personal access token to your Jenkins account.

D. Create a personal access token (PAT) in your Azure DevOps account.

E. Create a service hook in Azure DevOp

Correct Answer: BCD
Section: (none)
Explanation

Explanation/Reference:
Explanation:
B: Jenkins requires a plug-in to connect to TFS and check for updates to a project.
Jenkins' built-in Git Plugin or Team Foundation Server Plugin can poll a Team Services repository every few minutes and queue a job when changes are detected.

C: Use Azure DevOps/ Visual Studio Team Services to create a Personal access token.
D: After you have generated credentials using Visual Studio Team Services, you need to use those credentials in Jenkins.

Reference:
http://www.aisoftwarellc.com/blog/post/how-to-setup-automated-builds-using-jenkins-and-visual-studio-team-foundation-server/2044

QUESTION 19
You have an Azure Resource Manager template that deploys a multi-tier application.

You need to prevent the user who performs the deployment from viewing the account credentials and connection strings used by the application.

What should you use?

A. Azure Key Vault

B. a Web.config file

C. an Appsettings.json file

D. an Azure Storage table

E. an Azure Resource Manager parameter file

Correct Answer: A
Section: (none)
Explanation

Explanation/Reference:
Explanation:
When you need to pass a secure value (like a password) as a parameter during deployment, you can retrieve the value from an Azure Key Vault. You retrieve the value by referencing the key vault and secret in your parameter file. The value is never exposed because you only reference its key vault ID. The key vault can exist in a different subscription than the resource group you are deploying to.

References: https://docs.microsoft.com/en-us/azure/azure-resource-manager/resource-manager-keyvault-parameter

QUESTION 20
You are automating the build process for a Java-based application by using Azure DevOps.

You need to add code coverage testing and publish the outcomes to the pipeline.

What should you use?

A. Bullseye Coverage
B. JUnit
C. JaCoCo
D. NUnit

Correct Answer: C
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Use Publish Code Coverage Results task in a build pipeline to publish code coverage results to Azure Pipelines or TFS, which were produced by a build in Cobertura or JaCoCo format.

Incorrect Answers:
A: Bullseye Coverage is used for C++ code, and not for Java.

Reference:
https://docs.microsoft.com/en-us/azure/devops/pipelines/tasks/test/publish-code-coverage-results

QUESTION 21
You are deploying a server application that will run on a Server Core installation of Windows Server 2019.

You create an Azure key vault and a secret.

You need to use the key vault to secure API secrets for third-party integrations.

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

NOTE: Each correct selection is worth one point.

A. Configure RBAC for the key vault.
B. Modify the application to access the key vault.
C. Configure a Key Vault access policy.
D. Deploy an Azure Desired State Configuration (DSC) extension.
E. Deploy a virtual machine that uses a system-assigned managed identity.

Correct Answer: BCE
Section: (none)
Explanation

Explanation/Reference:
Explanation:
BE: An app deployed to Azure can take advantage of Managed identities for Azure resources, which allows the app to authenticate with Azure Key Vault using Azure AD authentication without credentials (Application ID and Password/Client Secret) stored in the app.

C:
1. Select Add Access Policy.
2. Open Secret permissions and provide the app with Get and List permissions.
3. Select Select principal and select the registered app by name. Select the Select button.
4. Select OK.
5. Select Save.
6. Deploy the app.

References: https://docs.microsoft.com/en-us/aspnet/core/security/key-vault-configuration

QUESTION 22
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 integrate a cloud-hosted Jenkins server and a new Azure DevOps deployment.

You need Azure DevOps to send a notification to Jenkins when a developer commits changes to a branch in Azure Repos.

Solution: You create an email subscription to an Azure DevOps notification.

Does this meet the goal?

A. Yes
B. No

Correct Answer: B
Section: (none)
Explanation
Explanation/Reference:
Explanation:
You can create a service hook for Azure DevOps Services and TFS with Jenkins.

References: https://docs.microsoft.com/en-us/azure/devops/service-hooks/services/jenkins

QUESTION 23
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 integrate a cloud-hosted Jenkins server and a new Azure DevOps deployment.

You need Azure DevOps to send a notification to Jenkins when a developer commits changes to a branch in Azure Repos.

Solution: You create a service hook subscription that uses the code pushed event.

Does this meet the goal?

A. Yes
B. No

Correct Answer: A
Section: (none)
Explanation

Explanation/Reference:
Explanation:
You can create a service hook for Azure DevOps Services and TFS with Jenkins.
The code push event is triggered when the code is pushed to a Git repository.

Reference:
https://docs.microsoft.com/en-us/azure/devops/service-hooks/services/jenkins https://docs.microsoft.com/en-us/azure/devops/service-hooks/events

QUESTION 24
Your company uses Azure DevOps to manage the build and release processes for applications.

You use a Git repository for applications source control.

You plan to create a new branch from an existing pull request. Later, you plan to merge the new branch and the target branch of the pull request.

You need to use a pull request action to create the new branch. The solution must ensure that the branch uses only a portion of the code in the pull request.

Which pull request action should you use?

A. Set as default branch
B. Approve with suggestions
C. Cherry-pick
D. Reactivate
E. Revert

Correct Answer: C
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Cherry-pick a pull request
To copy changes made in a pull request to another branch in your repo, follow these steps:
1. In a completed pull request, select Cherry-pick, or for an active pull request, select Cherry-pick from the ... menu. Cherry-picking a pull request in this way creates a new branch with the copied changes. Merge into a target branch in a second pull request.
2. In Target branch, enter the branch you want to merge the copied changes.
3. In Topic branch name, enter a new branch to contain the copied changes, then select Cherry-pick.
4. Select Create pull request to merge the topic branch into the target branch to complete the cherry-pick.

QUESTION 25
You have an Azure DevOps organization named Contoso that contains a project named Project1.

You provision an Azure key vault named Keyvault1.

You need to reference Keyvault1 secrets in a build pipeline of Project1.

What should you do first?

A. Add a secure file to Project1.
B. Create an XAML build service.

C. Create a variable group in Project1.
D. Configure the security policy of Contoso.

Correct Answer: D
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Before this will work, the build needs permission to access the Azure Key Vault. This can be added in the Azure Portal.

Open the Access Policies in the Key Vault and add a new one. Choose the principle used in the DevOps build.

QUESTION 26
You are designing a build pipeline in Azure Pipelines.

The pipeline requires a self-hosted agent. The build pipeline will run once daily and will take 30 minutes to complete.

You need to recommend a compute type for the agent. The solution must minimize costs.

What should you recommend?

A. an Azure Kubernetes Service (AKS) cluster
B. Azure Container Instances
C. an Azure virtual machine scale set
D. Azure virtual machines

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
If your pipelines are in Azure Pipelines, then you've got a convenient option to run your jobs using a Microsoft-hosted agent. With Microsoft-hosted agents, maintenance and upgrades are taken care of for you. Each time you run a pipeline, you get a fresh virtual machine. The virtual machine is discarded after one use. Microsoft-hosted agents can run jobs directly on the VM or in a container.

Note: You can try a Microsoft-hosted agent for no charge.

Reference:
https://docs.microsoft.com/en-us/azure/devops/pipelines/agents/hosted

Implement Continuous Integration

Testlet 1

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 question 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. If the case study has an **All Information** tab, note that the information displayed is identical to the information displayed on the subsequent tabs. When you are ready to answer a question, click the **Question** button to return to the question. **Overview**

Contoso, Ltd. is a manufacturing company that has a main office in Chicago.

Existing Environment

Contoso plans to improve its IT development and operations processes by implementing Azure DevOps principles. Contoso has an Azure subscription and creates an Azure DevOps organization.

The Azure DevOps organization includes:

▪ The Docker extension
▪ A deployment pool named Pool7 that contains 10 Azure virtual machines that run Windows Server 2016

The Azure subscription contains an Azure Automation account.

Requirements

Planned changes
Contoso plans to create projects in Azure DevOps as shown in the following table.

Project name	Project details
Project 1	Project1 will provide support for incremental builds and third-party SDK components
Project 2	Project2 will use an automatic build policy. A small team of developers named Team2 will work independently on changes to the project. The Team2 members will not have permissions to Project2.
Project 3	Project3 will be integrated with SonarQube
Project 4	Project4 will provide support for a build pipeline that creates a Docker image and pushes the image to the Azure Container Registry. Project4 will use an existing Dockerfile.
Project 5	Project5 will contain a Git repository in Azure Repos and a continuous integration trigger that will initiate a build in response to any change except for changes within /folder1 of the repository.
Project 6	Project6 will provide support for build and deployment pipelines. Deployment will be allowed only if the number of current work items representing active software bugs is 0.
Project 7	Project7 will contain a target deployment group named Group7 that maps to Pool7. Project7 will use Azure Automation State Configuration to maintain the desired state of the computers in Group7.

Technical requirements

Contoso identifies the following technical requirements:

▪ Implement build agents for Project1.
▪ Whenever possible, use Azure resources.
▪ Avoid using deprecated technologies.
▪ Implement a code flow strategy for Project2 that will:
    -Enable Team2 to submit pull requests for Project2.
    -Enable Team2 to work independently on changes to a copy of Project2.
    -Ensure that any intermediary changes performed by Team2 on a copy of Project2 will be subject to the same restrictions as the ones defined in the
     build policy of Project2.
▪ Whenever possible, implement automation and minimize administrative effort.
▪ Implement Project3, Project5, Project6, and Project7 based on the planned changes.
▪ Implement Project4 and configure the project to push Docker images to Azure Container Registry.

QUESTION 1
In Azure DevOps, you create Project3.

You need to meet the requirements of the project.

What should you do first?

A. From Azure DevOps, modify the build definition.
B. From SonarQube, obtain an authentication token.
C. From Azure DevOps, create a service endpoint.
D. From SonarQube, create a project.

Correct Answer: C
Section: (none)
Explanation

Explanation/Reference:
Explanation:
The first thing to do is to declare your SonarQube server as a service endpoint in your VSTS/DevOps project settings.

References: https://docs.sonarqube.org/display/SCAN/Analyzing+with+SonarQube+Extension+for+vsts-TFS

QUESTION 2
You need to implement Project4.

What should you do first?

A. Add the FROM instruction in the Dockerfile file.
B. Add a Copy and Publish Build Artifacts task to the build pipeline.
C. Add a Docker task to the build pipeline.
D. Add the MAINTAINER instruction in the Dockerfile file.

Correct Answer: C
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Scenario: Implement Project4 and configure the project to push Docker images to Azure Container Registry.

Project 4	Project4 will provide support for a build pipeline that creates a Docker image and pushes the image to the Azure Container Registry. Project4 will use an existing Dockerfile.

You use Azure Container Registry Tasks commands to quickly build, push, and run a Docker container image natively within Azure, showing how to offload your "inner-loop" development cycle to the cloud. ACR Tasks is a suite of features within Azure Container Registry to help you manage and modify container images across the container lifecycle.

References:
https://docs.microsoft.com/en-us/azure/container-registry/container-registry-quickstart-task-cli

Implement Continuous Integration

Question Set 2

QUESTION 1
You are designing an Azure DevOps strategy for your company's development team.

You suspect that the team's productivity is low due to accumulate technical debt.

You need to recommend a metric to assess the amount of the team's technical debt.

What should you recommend?

A. the number of code modules in an application
B. the number of unit test failures
C. the percentage of unit test failures
D. the percentage of overall time spent on rework

Correct Answer: D
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Technical Debt is the estimated cost to fix code elements issues.

Technical Debt Ratio: Ratio between the cost to develop the software and the cost to fix it. The Technical Debt Ratio formula is:

Remediation cost / Development cost

Which can be restated as:
Remediation cost / (Cost to develop 1 line of code * Number of lines of code)

References: http://www.azure365.co.in/devops/3PDevOps-
4

QUESTION 2
You are developing an open source solution that uses a GitHub repository.

You create a new public project in Azure DevOps.

You plan to use Azure Pipelines for continuous build. The solution will use the GitHub Checks API.

Which authentication type should you use?

A. OAuth
B. GitHub App
C. a personal access token (PAT)
D. SAML

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Write permission for the Checks API is only available to GitHub Apps.

Note: Authenticating as a GitHub App lets you do a couple of things:

You can retrieve high-level management information about your GitHub App.
You can request access tokens for an installation of the app.

Reference: https://docs.github.com/en/rest/guides/getting-started-with-the-checks-api

QUESTION 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.

Your company has a project in Azure DevOps for a new web application.

You need to ensure that when code is checked in, a build runs automatically.

Solution: From the Continuous deployment trigger settings of the release pipeline, you enable the **Pull request trigger** setting.

Does this meet the goal?

A. Yes

B. No

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
In Visual Designer you enable continuous integration (CI) by:
1. Select the Triggers tab.
2. Enable Continuous integration.

References: https://docs.microsoft.com/en-us/azure/devops/pipelines/get-started-designer

QUESTION 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.

Your company has a project in Azure DevOps for a new web application.

You need to ensure that when code is checked in, a build runs automatically.

Solution: From the Pre-deployment conditions settings of the release pipeline, you select **After stage**.

Does this meet the goal?

A. Yes
B. No

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Instead, In Visual Designer you enable continuous integration (CI) by:
1. Select the Triggers tab.

2. Enable Continuous integration.

References: https://docs.microsoft.com/en-us/azure/devops/pipelines/get-started-designer

QUESTION 5
Note: This question is part of a series of questions that present the same scenario. Each question in the series contains a unique solution that might meet the stated goals. Some question sets might have more than one correct solution, while others might not have a correct solution.

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

Your company has a project in Azure DevOps for a new web application.

You need to ensure that when code is checked in, a build runs automatically.

Solution: From the Pre-deployment conditions settings of the release pipeline, you select **Batch changes while a build is in progress**.

Does this meet the goal?

A. Yes
B. No

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Instead, In Visual Designer you enable continuous integration (CI) by:
1. Select the Triggers tab.
2. Enable Continuous integration.

Reference: https://docs.microsoft.com/en-us/azure/devops/pipelines/get-started-designer

QUESTION 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 a project in Azure DevOps for a new web application.

You need to ensure that when code is checked in, a build runs automatically.

Solution: From the Triggers tab of the build pipeline, you select **Enable continuous integration**.

Does this meet the goal?

A. Yes
B. No

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
In Visual Designer you enable continuous integration (CI) by:
1. Select the Triggers tab.
2. Enable Continuous integration.

A continuous integration trigger on a build pipeline indicates that the system should automatically queue a new build whenever a code change is committed.

References: https://docs.microsoft.com/en-us/azure/devops/pipelines/get-started-designer

QUESTION 7
You have a project in Azure DevOps. You have an Azure Resource Group deployment project in Microsoft Visual Studio that is checked in to the Azure DevOps project.

You need to create a release pipeline that will deploy resources by using Azure Resource Manager templates. The solution must minimize administrative effort.

Which task type should you include in the solution?

A. Azure Cloud Service Deployment
B. Azure RM Web App Deployment
C. Azure PowerShell
D. Azure App Service Manage

Correct Answer: C

Section: (none)
Explanation
Explanation/Reference:
Explanation:
There are two different ways to deploy templates to Azure DevOps Services. Both methods provide the same results, so choose the one that best fits your workflow.

1. Add a single step to your build pipeline that runs the PowerShell script that's included in the Azure Resource Group deployment project (DeployAzureResourceGroup.ps1). The script copies artifacts and then deploys the template.
2. Add multiple Azure DevOps Services build steps, each one performing a stage task.

The first option has the advantage of using the same script used by developers in Visual Studio and providing consistency throughout the lifecycle.

References: https://docs.microsoft.com/en-us/azure/vs-azure-tools-resource-groups-ci-in-vsts

QUESTION 8
Your company is building a new solution in Java.

The company currently uses a SonarQube server to analyze the code of .NET solutions.

You need to analyze and monitor the code quality of the Java solution.

Which task types should you add to the build pipeline?

A. Chef
B. Gradle
C. Octopus
D. xCODE

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
SonarQube is a set of static analyzers that can be used to identify areas of improvement in your code. It allows you to analyze the technical debt in your project and keep track of it in the future. With Maven and Gradle build tasks, you can run SonarQube analysis with minimal setup in a new or existing Azure DevOps Services build task.

QUESTION 9

You have an Azure DevOps organization named Contoso and an Azure DevOps project named Project1.

You plan to use Microsoft-hosted agents to build container images that will host full Microsoft .NET Framework apps in a YAML pipeline in Project1.

What are two possible virtual machine images that you can use for the Microsoft-hosted agent pool? Each correct answer presents a complete solution.

NOTE: Each correct selection is worth one point.

A. vs2017-win2016
B. ubuntu-16.04
C. win1803
D. macOS-10.13
E. vs.2015-win2012r2

Correct Answer: BC
Section: (none)
Explanation

Explanation/Reference:
Explanation:
The Microsoft-hosted agent pool provides 7 virtual machine images to choose from:
▪ Ubuntu 16.04 (ubuntu-16.04)
▪ Windows Server 1803 (win1803) - for running Windows containers
▪ Visual Studio 2019 Preview on Windows Server 2019 (windows-2019)
▪ Visual Studio 2017 on Windows Server 2016 (vs2017-win2016) ▪
Visual Studio 2015 on Windows Server 2012R2 (vs2015-win2012r2)
▪ macOS X Mojave 10.14 (macOS-10.14) ▪
macOS X High Sierra 10.13 (macOS-10.13)

References: https://docs.microsoft.com/en-us/azure/devops/pipelines/agents/hosted?view=azure-
devops

QUESTION 10
Your company has a project in Azure DevOps.

You need to ensure that when there are multiple builds pending deployment, only the most recent build is deployed.

What should you use?

A. deployment conditions
B. deployment queue settings

C. release gates
D. pull request triggers

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
The options you can choose for a queuing policy are:
▪ Number of parallel deployments
▪ If you specify a maximum number of deployments, two more options appear:
    - Deploy all in sequence
    - Deploy latest and cancel the others: Use this option if you are producing releases faster than builds, and you only want to deploy the latest build.

Incorrect Answers:
C: Release gates allow automatic collection of health signals from external services, and then promote the release when all the signals are successful at the same time or stop the deployment on timeout. Typically, gates are used in connection with incident management, problem management, change management, monitoring, and external approval systems.

References: https://docs.microsoft.com/en-us/azure/devops/pipelines/process/stages?tabs=classic&view=azure-devops#queuing-policies

QUESTION 11
Your company develops a client banking application that processes a large volume of data.

Code quality is an ongoing issue for the company. Recently, the code quality has deteriorated because of an increase in time pressure on the development team.

You need to implement static code analysis.

During which phase should you use static code analysis?

A. integration testing

B. staging
C. production release
D. build

Correct Answer: A
Section: (none)
Explanation
Explanation/Reference:
Explanation:
The Secure Development Lifecycle (SDL) Guidelines recommend that teams perform static analysis during the implementation phase of their development cycle.

Note: The company should focus in particular on the implementation of DevOps tests to assess the quality of the software from the planning stage to the implementation phase of the project.

References:
https://secdevtools.azurewebsites.net/

QUESTION 12
Your company is building a new solution in Java.

The company currently uses a SonarQube server to analyze the code of .NET solutions.

You need to analyze and monitor the code quality of the Java solution.

Which task types should you add to the build pipeline?

A. Grunt
B. Chef
C. Maven
D. Gulp

Correct Answer: C
Section: (none)
Explanation

Explanation/Reference:
Explanation:

SonarQube is a set of static analyzers that can be used to identify areas of improvement in your code. It allows you to analyze the technical debt in your project and keep track of it in the future. With Maven and Gradle build tasks, you can run SonarQube analysis with minimal setup in a new or existing Azure DevOps Services build task.

Reference: https://docs.microsoft.com/en-us/azure/devops/java/sonarqube?view=azure-devops

QUESTION 13
You are developing an application. The application source has multiple branches.

You make several changes to a branch used for experimentation.

You need to update the main branch to capture the changes made to the experimentation branch and override the history of the Git repository.

Which Git option should you use?

A. Rebase
B. Fetch
C. Merge
D. Push

Correct Answer: C
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Create pull requests to review and merge code in a Git project. Pull requests let your team review code and give feedback on changes before merging it into the master branch.

Incorrect Answers:
A: Use rebase to address the problem of updating your branch with the latest changes from the main branch. Rebase takes the changes made in the commits in your current branch and replays them on the history of another branch. The commit history of your current branch will be rewritten so that it starts from the most recent commit in the target branch of the rebase. Rebasing your changes in your feature branch off the latest changes in the main branch lets you test your changes on the most recent version in the main branch while keeping a clean Git history.

D: Share changes made in commits and branches using the push command. Push your branches to the remote repository. Git adds your commits to an existing branch on the remote or creates a new branch with the same commits as your local branch.

Reference:

QUESTION 14
You use WhiteSource Bolt to scan a Node.js application.

The WhiteSource Bolt scan identifies numerous libraries that have invalid licenses. The libraries are used only during development and are not part of a production deployment.

You need to ensure that WhiteSource Bolt only scans production dependencies.

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

NOTE: Each correct selection is worth one point.

A. Run `npm install` and specify the `--production` flag.

B. Modify the WhiteSource Bolt policy and set the action for the licenses used by the development tools to **Reassign**.
C. Modify the devDependencies section of the project's Package.json file.
D. Configure WhiteSource Bolt to scan the node_modules directory only.

Correct Answer: AC
Section: (none)
Explanation

Explanation/Reference:
Explanation:
A: To resolve NPM dependencies, you should first run "npm install" command on the relevant folders before executing the plugin.

C: All npm packages contain a file, usually in the project root, called package.json - this file holds various metadata relevant to the project. This file is used to give information to npm that allows it to identify the project as well as handle the project's dependencies. It can also contain other metadata such as a project description, the version of the project in a particular distribution, license information, even configuration data - all of which can be vital to both npm and to the end users of the package.

Reference:

https://whitesource.atlassian.net/wiki/spaces/WD/pages/34209870/NPM+Plugin

https://nodejs.org/en/knowledge/getting-started/npm/what-is-the-file-package-json

QUESTION 15
You use a Git repository in Azure Repos to manage the source code of a web application. Developers commit changes directly to the master branch.

You need to implement a change management procedure that meets the following requirements:

▪ The master branch must be protected, and new changes must be built in the feature branches first.
▪ Changes must be reviewed and approved by at least one release manager before each merge. ▪
Changes must be brought into the master branch by using pull requests.

What should you configure in Azure Repos?

A. branch policies of the master branch
B. Services in Project Settings
C. Deployment pools in Project Settings
D. branch security of the master branch

Correct Answer: A
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Branch policies help teams protect their important branches of development. Policies enforce your team's code quality and change management standards.

Reference:
https://docs.microsoft.com/en-us/azure/devops/repos/git/branch-policies

QUESTION 16
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 plan to update the Azure DevOps strategy of your company.

You need to identify the following issues as they occur during the company's development process:

▪ Licensing violations ▪
Prohibited libraries

Solution: You implement continuous integration.

Does this meet the goal?

A. Yes
B. No

Correct Answer: A
Section: (none)
Explanation

Explanation/Reference:
Explanation:
WhiteSource is the leader in continuous open source software security and compliance management. WhiteSource integrates into your build process, irrespective of your programming languages, build tools, or development environments. It works automatically, continuously, and silently in the background, checking the security, licensing, and quality of your open source components against WhiteSource constantly-updated definitive database of open source repositories.

Reference:
https://azuredevopslabs.com/labs/vstsextend/whitesource/

QUESTION 17
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 plan to update the Azure DevOps strategy of your company.

You need to identify the following issues as they occur during the company's development process:

▪ Licensing violations ▪
Prohibited libraries

Solution: You implement pre-deployment gates.

Does this meet the goal?

A. Yes
B. No

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Instead use implement continuous integration.

Note: WhiteSource is the leader in continuous open source software security and compliance management. WhiteSource integrates into your build process, irrespective of your programming languages, build tools, or development environments. It works automatically, continuously, and silently in the background, checking the security, licensing, and quality of your open source components against WhiteSource constantly-updated definitive database of open source repositories.

Reference:
https://azuredevopslabs.com/labs/vstsextend/whitesource/

QUESTION 18
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 plan to update the Azure DevOps strategy of your company.

You need to identify the following issues as they occur during the company's development process:

▪ Licensing violations ▪
Prohibited libraries

Solution: You implement automated security testing.

Does this meet the goal?

A. Yes
B. No

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Instead use implement continuous integration.

Note: WhiteSource is the leader in continuous open source software security and compliance management. WhiteSource integrates into your build process, irrespective of your programming languages, build tools, or development environments. It works automatically, continuously, and silently in the background, checking the security, licensing, and quality of your open source components against WhiteSource constantly-updated definitive database of open source repositories.

Reference:
https://azuredevopslabs.com/labs/vstsextend/whitesource/

QUESTION 19
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 uses Azure DevOps to manage the build and release processes for applications.

You use a Git repository for applications source control.

You need to implement a pull request strategy that reduces the history volume in the master branch.

Solution: You implement a pull request strategy that uses fast-forward merges.

Does this meet the goal?

A. Yes
B. No

Correct Answer: A
Section: (none)
Explanation

Explanation/Reference:
Explanation:
No fast-forward merge - This option merges the commit history of the source branch when the pull request closes and creates a merge commit in the target branch.

Reference:
https://docs.microsoft.com/en-us/azure/devops/repos/git/branch-policies

QUESTION 20

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 uses Azure DevOps to manage the build and release processes for applications.

You use a Git repository for applications source control.

You need to implement a pull request strategy that reduces the history volume in the master branch.

Solution: You implement a pull request strategy that uses squash merges.

Does this meet the goal?

A. Yes
B. No

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Instead use fast-forward merge.

Note:
Squash merge - Complete all pull requests with a squash merge, creating a single commit in the target branch with the changes from the source branch.

No fast-forward merge - This option merges the commit history of the source branch when the pull request closes and creates a merge commit in the target branch.

Reference:
https://docs.microsoft.com/en-us/azure/devops/repos/git/branch-policies

QUESTION 21
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 uses Azure DevOps to manage the build and release processes for applications.

You use a Git repository for applications source control.

You need to implement a pull request strategy that reduces the history volume in the master branch.

Solution: You implement a pull request strategy that uses an explicit merge.

Does this meet the goal?

A. Yes
B. No

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:

Instead use fast-forward merge.

Note:
No fast-forward merge - This option merges the commit history of the source branch when the pull request closes and creates a merge commit in the target branch.

Reference:
https://docs.microsoft.com/en-us/azure/devops/repos/git/branch-policies

QUESTION 22
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 uses Azure DevOps to manage the build and release processes for applications.

You use a Git repository for applications source control.

You need to implement a pull request strategy that reduces the history volume in the master branch.

Solution: You implement a pull request strategy that uses a three-way merge.

Does this meet the goal?

A. Yes
B. No

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Instead use fast-forward merge.

Note:
No fast-forward merge - This option merges the commit history of the source branch when the pull request closes and creates a merge commit in the target branch.

Reference:
https://docs.microsoft.com/en-us/azure/devops/repos/git/branch-policies

QUESTION 23
You need to recommend a Docker container build strategy that meets the following requirements:

▪ Minimizes image sizes
▪ Minimizes the security surface area of the final image What

should you include in the recommendation?

A. multi-stage builds
B. PowerShell Desired State Configuration (DSC)
C. Docker Swarm
D. single-stage builds

Correct Answer: A
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Multi-stage builds are a new feature requiring Docker 17.05 or higher on the daemon and client. Multistage builds are useful to anyone who has struggled to optimize Dockerfiles while keeping them easy to read and maintain.

Incorrect Answers:
C: A swarm consists of multiple Docker hosts which run in swarm mode and act as managers (to manage membership and delegation) and workers (which run swarm services).

References: https://docs.docker.com/develop/develop-images/multistage-build/

QUESTION 24
You plan to create an image that will contain a .NET Core application.

You have a Dockerfile file that contains the following code. (Line numbers are included for reference only.)

```
01 FROM microsoft/dotnet:2.1-sdk
02 COPY . /
03 RUN dotnet publish -c Release -o out
04 FROM microsoft/dotnet:2.1-sdk
05 COPY --from=0 /out /
06 WORKDIR /
07 ENTRYPOINT ["dotnet", "app1.dll"]
```

You need to ensure that the image is as small as possible when the image is built.

Which line should you modify in the file?

A. 1
B. 3
C. 4
D. 7

Correct Answer: A
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Multi-stage builds (in Docker 17.05 or higher) allow you to drastically reduce the size of your final image, without struggling to reduce the number of intermediate layers and files.

With multi-stage builds, you use multiple FROM statements in your Dockerfile. Each FROM instruction can use a different base, and each of them begins a new stage of the build. You can selectively copy artifacts from one stage to another, leaving behind everything you don't want in the final image.

References: https://docs.docker.com/develop/develop-images/multistage-build/#use-multi-stage-builds

QUESTION 25
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 a project in Azure DevOps for a new web application.

You need to ensure that when code is checked in, a build runs automatically.

Solution: From the Triggers tab of the build pipeline, you select **Batch changes while a build is in progress**.

Does this meet the goal?

A. Yes
B. No

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Instead, In Visual Designer you enable continuous integration (CI) by:
1. Select the Triggers tab.
2. Enable Continuous integration.

Note: Batch changes
Select this check box if you have many team members uploading changes often and you want to reduce the number of builds you are running. If you select this option, when a build is running, the system waits until the build is completed and then queues another build of all changes that have not yet been built.

References: https://docs.microsoft.com/en-us/azure/devops/pipelines/get-started-designer

QUESTION 26
You have 50 Node.js-based projects that you scan by using WhiteSource. Each project includes Package.json, Package-lock.json, and Npm-shrinkwrap.json files.

You need to minimize the number of libraries reports by WhiteSource to only the libraries that you explicitly reference.

What should you do?

A. Configure the File System Agent plug-in.
B. Add a devDependencies section to Package-lock.json.
C. Configure the Artifactory plug-in.
D. Delete Package-lock.json.

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Separate Your Dependencies
Within your package.json file be sure you split out your npm dependencies between devDependencies and (production) dependencies. The key part is that you must then make use of the --production flag when installing the npm packages. The --production flag will exclude all packages defined in the devDependencies section.

References: https://blogs.msdn.microsoft.com/visualstudioalmrangers/2017/06/08/manage-your-open-source-usage-and-security-as-reported-by-your-cicd-pipeline/

QUESTION 27
Your company deploys applications in Docker containers.

You want to detect known exploits in the Docker images used to provision the Docker containers.

You need to integrate image scanning into the application lifecycle. The solution must expose the exploits as early as possible during the application lifecycle.

What should you configure?

A. a task executed in the continuous integration pipeline and a scheduled task that analyzes the image registry
B. manual tasks performed during the planning phase and the deployment phase
C. a task executed in the continuous deployment pipeline and a scheduled task against a running production container
D. a task executed in the continuous integration pipeline and a scheduled task that analyzes the production container

Correct Answer: A
Section: (none)
Explanation

Explanation/Reference:
Explanation:
You can use the Docker task to sign into ACR and then use a subsequent script to pull an image and scan the container image for vulnerabilities.
Use the docker task in a build or release pipeline. This task can be used with Docker or Azure Container registry.

Incorrect Answers:
C: We should not wait until deployment. We want to detect the exploits as early as possible.
D: We should wait until the image is in the product container. We want to detect the exploits as early as possible.

References: https://docs.microsoft.com/en-us/azure/devops/articles/security-validation-cicd-pipeline?view=vsts

QUESTION 28
Your company uses Azure DevOps for the build pipelines and deployment pipelines of Java-based projects.

You need to recommend a strategy for managing technical debt.

Which two actions should you include in the recommendation? Each correct answer presents part of the solution.

NOTE: Each correct selection is worth one point.

A. Configure post-deployment approvals in the deployment pipeline.
B. Configure pre-deployment approvals in the deployment pipeline.
C. Integrate Azure DevOps and SonarQube.

D. Integrate Azure DevOps and Azure DevTest Labs.

Correct Answer: BC
Section: (none)
Explanation

Explanation/Reference:

QUESTION 29
Your company has a hybrid cloud between Azure and Azure Stack.

The company uses Azure DevOps for its full CI/CD pipelines. Some applications are built by using Erlang and Hack.

You need to ensure that Erlang and Hack are supported as part of the build strategy across the hybrid cloud. The solution must minimize management overhead.

What should you use to execute the build pipeline?

A. a Microsoft-hosted agent
B. Azure DevOps self-hosted agents on Azure DevTest Labs virtual machines.
C. Azure DevOps self-hosted agents on Hyper-V virtual machines

D. Azure DevOps self-hosted agents on virtual machines that run on Azure Stack

Correct Answer: D
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Azure Stack offers virtual machines (VMs) as one type of an on-demand, scalable computing resource. You can choose a VM when you need more control over the computing environment.

References: https://docs.microsoft.com/en-us/azure/azure-stack/user/azure-stack-compute-overview

QUESTION 30
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 plan to update the Azure DevOps strategy of your company.

You need to identify the following issues as they occur during the company's development process:

▪ Licensing violations ▪
Prohibited libraries

Solution: You implement continuous deployment.

Does this meet the goal?

A. Yes
B. No

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Instead implement continuous integration.

Note: WhiteSource is the leader in continuous open source software security and compliance management. WhiteSource integrates into your build process, irrespective of your programming languages, build tools, or development environments. It works automatically, continuously, and silently in the background, checking the security, licensing, and quality of your open source components against WhiteSource constantly-updated definitive database of open source repositories.

Reference:
https://azuredevopslabs.com/labs/vstsextend/whitesource/

QUESTION 31
Your company has an Azure DevOps project,

The source code for the project is stored in an on-premises repository and uses on an on-premises build server.

You plan to use Azure DevOps to control the build process on the build server by using a self-hosted agent.

You need to implement the self-hosted agent.

You download and install the agent on the build server.

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

A. From Azure, create a shared access signature (SAS).
B. From the build server, create a certificate, and then upload the certificate to Azure Storage.
C. From the build server, create a certificate, and then upload the certificate to Azure Key Vault.
D. From DevOps, create a personal access token (PAT).
E. From the build server, run `config.cmd`.

Correct Answer: BE
Section: (none)
Explanation

Explanation/Reference:
Explanation:
B: Make sure you install your self-signed ssl server certificate into the OS certificate store.

E: When you have a self-signed SSL certificate for your on-premises TFS server, make sure to configure the Git we shipped to allow that self-signed SSL certificate.

Enable git to use SChannel during configure with 2.129.0 or higher version agent Pass --gituseschannel during agent configuration

./config.cmd --gituseschannel

Reference:
https://docs.microsoft.com/en-us/azure/devops/pipelines/agents/certificate

QUESTION 32
You have an Azure subscription that contains an Azure Active Directory (Azure AD) tenant.

You are configuring a build pipeline in Azure Pipelines that will include a task named Task1. Task1 will authenticate by using an Azure AD service principal.

Which three values should you configure for Task1? Each correct answer presents part of the solution.

NOTE: Each correct selection is worth one point.

A. the tenant ID
B. the subscription ID
C. the client secret
D. the app ID
E. the object ID

Correct Answer: ABD
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Create an Azure Resource Manager service connection with an existing service principal

AB: Enter the information about your service principal into the Azure subscription dialog textboxes: ▪
Tenant ID
▪ Subscription ID
▪ Subscription name
▪ Service principal ID
Either the service principal client key or, if you have selected Certificate, enter the contents of both the certificate and private key sections of the *.pem file.

D: To deploy to a specific Azure resource, the task will need additional data about that resource.

If you're using the classic editor, select data you need. For example, the App service name.

If you're using YAML, then go to the resource in the Azure portal, and then copy the data into your code. For example, to deploy a web app, you would copy the name of the App Service into the WebAppName value.

Reference:
https://docs.microsoft.com/en-us/azure/devops/pipelines/library/connect-to-azure

QUESTION 33
You need to execute inline testing of an Azure DevOps pipeline that uses a Docker deployment model. The solution must prevent the results from being published to the pipeline.

What should you use for the inline testing?

A. a single stage Dockerfile
B. an Azure Kubernetes Service (AKS) pod
C. a multi-stage Dockerfile
D. a Docker Compose file

Correct Answer: D
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Use Docker when running integration tests with Azure Pipelines.

Reference:
https://crossprogramming.com/2019/12/27/use-docker-when-running-integration-tests-with-azure-pipelines.html

Implement Continuous Delivery

Testlet 1

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 question 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. If the case study has an **All Information** tab, note that the information displayed is identical to the information displayed on the subsequent tabs. When you are ready to answer a question, click the **Question** button to return to the question. **Overview**

Litware, Inc. is an independent software vendor (ISV). Litware has a main office and five branch offices.

Existing Environment

Application Architecture

The company's primary application is a single monolithic retirement fund management system based on ASP.NET web forms that use logic written in VB.NET. Some new sections of the application are written in C#.

Variations of the application are created for individual customers. Currently, there are more than 80 live code branches in the application's code base.

The application was developed by using Microsoft Visual Studio. Source code is stored in Team Foundation Server (TFS) in the main office. The branch offices access the source code by using TFS proxy servers.

Architectural Issues

Litware focuses on writing new code for customers. No resources are provided to refactor or remove existing code. Changes to the code base take a long time, as dependencies are not obvious to individual developers.

Merge operations of the code often take months and involve many developers. Code merging frequently introduces bugs that are difficult to locate and resolve.

Customers report that ownership costs of the retirement fund management system increase continually. The need to merge unrelated code makes even minor code changes expensive.

Customers report that bug reporting is overly complex.

Requirements

Planned changes

Litware plans to develop a new suite of applications for investment planning. The investment planning applications will require only minor integration with the existing retirement fund management system.

The investment planning applications suite will include one multi-tier web application and two iOS mobile applications. One mobile application will be used by employees; the other will be used by customers.

Litware plans to move to a more agile development methodology. Shared code will be extracted into a series of packages.

Litware has started an internal cloud transformation process and plans to use cloud-based services whenever suitable.

Litware wants to become proactive in detecting failures, rather than always waiting for customer bug reports.

Technical requirements

The company's investment planning applications suite must meet the following requirements:

▪ New incoming connections through the firewall must be minimized.
▪ Members of a group named Developers must be able to install packages.
▪ The principle of least privilege must be used for all permission assignments.
▪ A branching strategy that supports developing new functionality in isolation must be used.
▪ Members of a group named Team Leaders must be able to create new packages and edit the permissions of package feeds.
▪ Visual Studio App Center must be used to centralize the reporting of mobile application crashes and device types in use.
▪ By default, all releases must remain available for 30 days, except for production releases, which must be kept for 60 days.
▪ By default, all App Center must be used to centralize the reporting of mobile application crashes and device types in use.
▪ Code quality and release quality are critical. During release, deployments must not proceed between stages if any active bugs are logged against the release. ▪
The mobile applications must be able to call the share pricing service of the existing retirement fund management system. Until the system is upgraded, the service will only support basic authentication over HTTPS.
▪ The required operating system configuration for the test servers changes weekly. Azure Automation State Configuration must be used to ensure that the operating system on each test server is configured the same way when the servers are created and checked periodically.

Current Technical Issue

The test servers are configured correctly when first deployed, but they experience configuration drift over time. Azure Automation State Configuration fails to correct the configurations.

Azure Automation State Configuration nodes are registered by using the following command.

```
Register-AzureRmAutomationDscNode
  -ResourceGroupName 'TestResourceGroup'
  -AutomationAccountName 'LitwareAutomationAccount'
  -AzureVMName $vname
  -ConfigurationMode 'ApplyOnly'
```

QUESTION 1
What should you use to implement the code quality restriction on the release pipeline for the investment planning applications suite?

A. a pre-deployment approval
B. a deployment gate
C. a post-deployment approval
D. a trigger

Correct Answer: A
Section: (none)
Explanation

Explanation/Reference:
Explanation:
When a release is created from a release pipeline that defines approvals, the deployment stops at each point where approval is required until the specified approver grants approval or rejects the release (or re-assigns the approval to another user).

Scenario: Code quality and release quality are critical. During release, deployments must not proceed between stages if any active bugs are logged against the release.

References: https://docs.microsoft.com/en-us/azure/devops/pipelines/release/approvals/approvals

Implement Continuous Delivery

Question Set 2

QUESTION 1

You have an Azure DevOps project named Project1 and an Azure subscription named Sub1. Sub1 contains an Azure SQL database named DB1.

You need to create a release pipeline that uses the Azure SQL Database Deployment task to update DB1.

Which artifact should you deploy?

A. a BACPAC
B. a DACPAC
C. an LDF file
D. an MDF file

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Use Azure SQL Database Deployment task in a build or release pipeline to deploy to Azure SQL DB using a DACPAC or run scripts using SQLCMD.

Reference: https://docs.microsoft.com/en-us/azure/devops/pipelines/tasks/deploy/sql-azure-dacpac-deployment

QUESTION 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 plan to create a release pipeline that will deploy Azure resources by using Azure Resource Manager templates. The release pipeline will create the following resources:

▪ Two resource groups
▪ Four Azure virtual machines in one resource group
▪ Two Azure SQL databases in other resource group

You need to recommend a solution to deploy the resources.

Solution: Create a main template that will deploy the resources in one resource group and a nested template that will deploy the resources in the other resource group.

Does this meet the goal?

A. Yes
B. No

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Use two linked templates, instead of the nested template.

References: https://docs.microsoft.com/en-us/azure/azure-resource-manager/resource-group-linked-templates

QUESTION 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 plan to create a release pipeline that will deploy Azure resources by using Azure Resource Manager templates. The release pipeline will create the following resources:

▪ Two resource groups
▪ Four Azure virtual machines in one resource group
▪ Two Azure SQL databases in other resource group

You need to recommend a solution to deploy the resources.

Solution: Create a main template that has two linked templates, each of which will deploy the resources in its respective group.

Does this meet the goal?

A. Yes
B. No

Correct Answer: A
Section: (none)
Explanation

Explanation/Reference:
Explanation:
To deploy your solution, you can use either a single template or a main template with many related templates. The related template can be either a separate file that is linked to from the main template, or a template that is nested within the main template.

References: https://docs.microsoft.com/en-us/azure/azure-resource-manager/resource-group-linked-templates

QUESTION 4
Your company has a project in Azure DevOps for a new web application.

The company uses ServiceNow for change management.

You need to ensure that a change request is processed before any components can be deployed to the production environment.

What are two ways to integrate ServiceNow into the Azure DevOps release pipeline? Each correct answer presents a complete solution.

NOTE: Each correct selection is worth one point.

A. Define a deployment control that invokes the ServiceNow REST API.
B. Define a pre-deployment gate before the deployment to the Prod stage.
C. Define a deployment control that invokes the ServiceNow SOAP API.
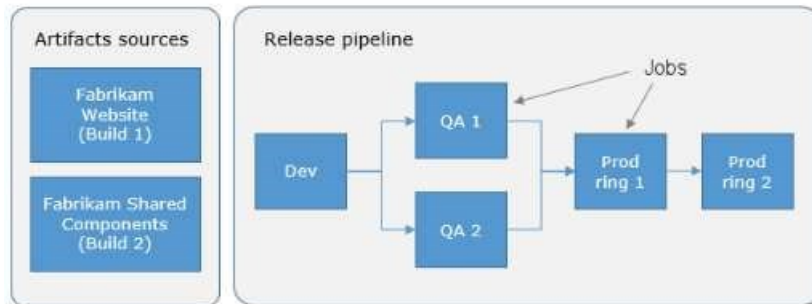D. Define a post-deployment gate after the deployment to the QA stage.

Correct Answer: BD
Section: (none)
Explanation

Explanation/Reference:
Explanation:
An example of a release pipeline that can be modeled through a release pipeline in shown below:

In this example, a release of a website is created by collecting specific versions of two builds (artifacts), each from a different build pipeline. The release is first deployed to a Dev stage and then forked to two QA stages in parallel. If the deployment succeeds in both the QA stages, the release is deployed to Prod ring 1 and then to Prod ring 2. Each production ring represents multiple instances of the same website deployed at various locations around the globe. References:

https://docs.microsoft.com/en-us/azure/devops/pipelines/release

QUESTION 5
You plan to use Terraform to deploy an Azure resource group.

You need to install the required frameworks to support the planned deployment.

Which two frameworks should you install? Each correct answer presents part of the solution.

NOTE: Each correct selection is worth one point.

A. Vault
B. Terratest
C. Node.js
D. Yeoman
E. Tiller

Correct Answer: BD
Section: (none)
Explanation

Explanation/Reference:
Explanation:

You can use the combination of Terraform and Yeoman. Terraform is a tool for creating infrastructure on Azure. Yeoman makes it easy to create Terraform modules.

Terratest provides a collection of helper functions and patterns for common infrastructure testing tasks, like making HTTP requests and using SSH to access a specific virtual machine. The following list describes some of the major advantages of using Terratest:
▪ Convenient helpers to check infrastructure - This feature is useful when you want to verify your real infrastructure in the real environment.
▪ Organized folder structure - Your test cases are organized clearly and follow the standard Terraform module folder structure.
▪ Test cases are written in Go - Many developers who use Terraform are Go developers. If you're a Go developer, you don't have to learn another programming language to use Terratest.
▪ Extensible infrastructure - You can extend additional functions on top of Terratest, including Azure-specific features.

Reference:
https://docs.microsoft.com/en-us/azure/developer/terraform/create-base-template-using-yeoman https://docs.microsoft.com/en-

us/azure/developer/terraform/test-modules-using-terratest

QUESTION 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 have an approval process that contains a condition. The condition requires that releases be approved by a team leader before they are deployed.

You have a policy stating that approvals must occur within eight hours.

You discover that deployment fail if the approvals take longer than two hours.

You need to ensure that the deployments only fail if the approvals take longer than eight hours.

Solution: From Post-deployment conditions, you modify the Time between re-evaluation of gates option.

Does this meet the goal?

A. Yes
B. No

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Use a gate From Pre-deployment conditions instead.

References: https://docs.microsoft.com/en-us/azure/devops/pipelines/release/approvals/gates

QUESTION 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 that might meet the stated goals. Some question sets might have more than one correct solution, while others might not have a correct solution.

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

You have an approval process that contains a condition. The condition requires that releases be approved by a team leader before they are deployed.

You have a policy stating that approvals must occur within eight hours.

You discover that deployment fail if the approvals take longer than two hours.

You need to ensure that the deployments only fail if the approvals take longer than eight hours.

Solution: From Pre-deployment conditions, you modify the Time between re-evaluation of gates option.

Does this meet the goal?

A. Yes
B. No

Correct Answer: A
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Gates allow automatic collection of health signals from external services, and then promote the release when all the signals are successful at the same time or stop the deployment on timeout. Typically, gates are used in connection with incident management, problem management, change management, monitoring, and external approval systems.

Approvals and gates give you additional control over the start and completion of the deployment pipeline. Each stage in a release pipeline can be configured with pre-deployment and post-deployment conditions that can include waiting for users to manually approve or reject deployments, and checking with other automated systems until specific conditions are verified.

QUESTION 8
Note: This question is part of a series of questions that present the same scenario. Each question in the series contains a unique solution that might meet the stated goals. Some question sets might have more than one correct solution, while others might not have a correct solution.

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

You have an approval process that contains a condition. The condition requires that releases be approved by a team leader before they are deployed.

You have a policy stating that approvals must occur within eight hours.

You discover that deployment fail if the approvals take longer than two hours.

You need to ensure that the deployments only fail if the approvals take longer than eight hours.

Solution: From Pre-deployment conditions, you modify the Timeout setting for pre-deployment approvals.

Does this meet the goal?

A. Yes
B. No

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Use a gate instead of an approval instead.

QUESTION 9
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 plan to create a release pipeline that will deploy Azure resources by using Azure Resource Manager templates. The release pipeline will create the following resources:

- Two resource groups
- Four Azure virtual machines in one resource group
- Two Azure SQL databases in other resource group

You need to recommend a solution to deploy the resources.

Solution: Create two standalone templates, each of which will deploy the resources in its respective group.

Does this meet the goal?

A. Yes
B. No

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Use a main template and two linked templates.

References: https://docs.microsoft.com/en-us/azure/azure-resource-manager/resource-group-linked-templates

QUESTION 10
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 plan to create a release pipeline that will deploy Azure resources by using Azure Resource Manager templates. The release pipeline will create the following resources:

- Two resource groups
- Four Azure virtual machines in one resource group
- Two Azure SQL databases in other resource group

You need to recommend a solution to deploy the resources.

Solution: Create a single standalone template that will deploy all the resources.

Does this meet the goal?

A. Yes
B. No

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Use two templates, one for each resource group, and link the templates.

References: https://docs.microsoft.com/en-us/azure/azure-resource-manager/resource-group-linked-templates

QUESTION 11
Note: This question is part of a series of questions that present the same scenario. Each question in the series contains a unique solution that might meet the stated goals. Some question sets might have more than one correct solution, while others might not have a correct solution.

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

You have an approval process that contains a condition. The condition requires that releases be approved by a team leader before they are deployed.

You have a policy stating that approvals must occur within eight hours.

You discover that deployment fail if the approvals take longer than two hours.

You need to ensure that the deployments only fail if the approvals take longer than eight hours.

Solution: From Post-deployment conditions, you modify the Timeout setting for post-deployment approvals.

Does this meet the goal?

A. Yes
B. No

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Use Pre-deployments conditions instead.
Use a gate instead of an approval instead.

References: https://docs.microsoft.com/en-us/azure/devops/pipelines/release/approvals/gates

QUESTION 12
Note: This question is part of a series of questions that present the same scenario. Each question in the series contains a unique solution that might meet the stated goals. Some question sets might have more than one correct solution, while others might not have a correct solution.

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

You have an Azure DevOps project.

Your build process creates several artifacts.

You need to deploy the artifacts to on-premises servers.

Solution: You deploy a Kubernetes cluster on-premises. You deploy a Helm agent to the cluster. You add a Download Build Artifacts task to the deployment pipeline.

Does this meet the goal?

A. Yes
B. No

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Instead you should deploy an Azure self-hosted agent to an on-premises server.

Note: To build your code or deploy your software using Azure Pipelines, you need at least one agent.

If your on-premises environments do not have connectivity to a Microsoft-hosted agent pool (which is typically the case due to intermediate firewalls), you'll need to manually configure a self-hosted agent on on-premises computer(s).

Note 2: As we [Microsoft] are launching this new experience in preview, we are currently optimizing it for Azure Kubernetes Service (AKS) and Azure Container Registry (ACR). Other Kubernetes clusters, for example running on-premises or in other clouds, as well as other container registries, can be used, but require setting up a Service Account and connection manually.

References:
https://docs.microsoft.com/en-us/azure/devops/pipelines/agents/agents?view=azure-devops

QUESTION 13
Note: This question is part of a series of questions that present the same scenario. Each question in the series contains a unique solution that might meet the stated goals. Some question sets might have more than one correct solution, while others might not have a correct solution.

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

You have an Azure DevOps project.

Your build process creates several artifacts.

You need to deploy the artifacts to on-premises servers.

Solution: You deploy a Docker build to an on-premises server. You add a Download Build Artifacts task to the deployment pipeline.

Does this meet the goal?

A. Yes
B. No

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Instead you should deploy an Azure self-hosted agent to an on-premises server.

Note: To build your code or deploy your software using Azure Pipelines, you need at least one agent.

If your on-premises environments do not have connectivity to a Microsoft-hosted agent pool (which is typically the case due to intermediate firewalls), you'll need to manually configure a self-hosted agent on on-premises computer(s).

References: https://docs.microsoft.com/en-us/azure/devops/pipelines/agents/agents?view=azure-devops

QUESTION 14
This question is part of a series of questions that present the same scenario. Each question in the series contains a unique solution that might meet the stated goals. Some question sets might have more than one correct solution, while others might not have a correct solution.

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

Your build process creates several artifacts.

You need to deploy the artifacts to on-premises servers.

Solution: You deploy an Azure self-hosted agent to an on-premises server. You add a Copy and Publish Build Artifacts task to the deployment pipeline.

Does this meet the goal?

A. Yes
B. No

Correct Answer: A
Section: (none)
Explanation

Explanation/Reference:
Explanation:
To build your code or deploy your software using Azure Pipelines, you need at least one agent.

If your on-premises environments do not have connectivity to a Microsoft-hosted agent pool (which is typically the case due to intermediate firewalls), you'll need to manually configure a self-hosted agent on on-premises computer(s). The agents must have connectivity to the target on-premises environments, and access to the Internet to connect to Azure Pipelines or Team Foundation Server.

References: https://docs.microsoft.com/en-us/azure/devops/pipelines/agents/agents?view=azure-devops

QUESTION 15
Your company hosts a web application in Azure. The company uses Azure Pipelines for the build and release management of the application.

Stakeholders report that the past few releases have negatively affected system performance.

You configure alerts in Azure Monitor.

You need to ensure that new releases are only deployed to production if the releases meet defined performance baseline criteria in the staging environment first.

What should you use to prevent the deployment of releases that fall to meet the performance baseline?

A. an Azure Scheduler job
B. a trigger

C. a gate
D. an Azure function

Correct Answer: C
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Scenarios and use cases for gates include:
▪ Quality validation. Query metrics from tests on the build artifacts such as pass rate or code coverage and deploy only if they are within required thresholds.

Use Quality Gates to integrate monitoring into your pre-deployment or post-deployment. This ensures that you are meeting the key health/performance metrics (KPIs) as your applications move from dev to production and any differences in the infrastructure environment or scale is not negatively impacting your KPIs.

Note: Gates allow automatic collection of health signals from external services, and then promote the release when all the signals are successful at the same time or stop the deployment on timeout. Typically, gates are used in connection with incident management, problem management, change management, monitoring, and external approval systems.

References: https://docs.microsoft.com/en-us/azure/azure-monitor/continuous-monitoring

https://docs.microsoft.com/en-us/azure/devops/pipelines/release/approvals/gates?view=azure-

devops

QUESTION 16
You need to configure GitHub to use Azure Active Directory (Azure AD) for authentication.

What should you do first?

A. Create a conditional access policy in Azure AD.
B. Register GitHub in Azure AD.
C. Create an Azure Active Directory B2C (Azure AD B2C) tenant.
D. Modify the Security settings of the GitHub organization.

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
When you connect to a Git repository from your Git client for the first time, the credential manager prompts for credentials. Provide your Microsoft account or Azure AD credentials.

Note: Git Credential Managers simplify authentication with your Azure Repos Git repositories. Credential managers let you use the same credentials that you use for the Azure DevOps Services web portal. Credential managers support multi-factor authentication through Microsoft account or Azure Active Directory (Azure AD).
Besides supporting multi-factor authentication with Azure Repos, credential managers also support two-factor authentication with GitHub repositories.

Reference:
https://docs.microsoft.com/en-us/azure/devops/repos/git/set-up-credential-managers

QUESTION 17
You have a project in Azure DevOps named Project1. Project1 contains a pipeline that builds a container image named Image1 and pushes Image1 to an Azure container registry named ACR1. Image1 uses a base image stored in Docker Hub.

You need to ensure that Image1 is updated automatically whenever the base image is updated.

What should you do?

A. Enable the Azure Event Grid resource provider and subscribe to registry events.
B. Add a Docker Hub service connection to Azure Pipelines.
C. Create and run an Azure Container Registry task.
D. Create a service hook in Project1.

Correct Answer: C
Section: (none)
Explanation

Explanation/Reference:
Explanation:
ACR Tasks supports automated container image builds when a container's base image is updated, such as when you patch the OS or application framework in one of your base images.

Reference:

QUESTION 18

You have a free tier of an Azure DevOps organization named Contoso. Contoso contains 10 private projects. Each project has multiple jobs with no dependencies.

You frequently run the jobs on five self-hosted agents but experience long build times and frequently queued builds.

You need to minimize the number of queued builds and the time it takes to run the builds.

What should you do?

A. Configure the pipelines to use the Microsoft-hosted agents.
B. Register additional self-hosted agents.
C. Purchase self-hosted parallel jobs.
D. Purchase Microsoft-hosted parallel jobs.

Correct Answer: D
Section: (none)
Explanation

Explanation/Reference:
Explanation:
When the free tier is no longer sufficient, you can pay for additional capacity per parallel job.

Note: Microsoft-hosted CI/CD
If you want to run your jobs on machines that Microsoft manages, use Microsoft-hosted parallel jobs. Your jobs run on our pool of Microsoft-hosted agents.

We provide a free tier of service by default in every organization.

Reference:
https://docs.microsoft.com/en-us/azure/devops/pipelines/licensing/concurrent-jobs

Implement Dependency Management

Testlet 1

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 question 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. If the case study has an **All Information** tab, note that the information displayed is identical to the information displayed on the subsequent tabs. When you are ready to answer a question, click the **Question** button to return to the question. **Overview**

Litware, Inc. is an independent software vendor (ISV). Litware has a main office and five branch offices.

Existing Environment

Application Architecture

The company's primary application is a single monolithic retirement fund management system based on ASP.NET web forms that use logic written in VB.NET. Some new sections of the application are written in C#.

Variations of the application are created for individual customers. Currently, there are more than 80 live code branches in the application's code base.

The application was developed by using Microsoft Visual Studio. Source code is stored in Team Foundation Server (TFS) in the main office. The branch offices access the source code by using TFS proxy servers.

Architectural Issues

Litware focuses on writing new code for customers. No resources are provided to refactor or remove existing code. Changes to the code base take a long time, as dependencies are not obvious to individual developers.

Merge operations of the code often take months and involve many developers. Code merging frequently introduces bugs that are difficult to locate and resolve.

Customers report that ownership costs of the retirement fund management system increase continually. The need to merge unrelated code makes even minor code changes expensive.

Customers report that bug reporting is overly complex.

Requirements

Planned changes

Litware plans to develop a new suite of applications for investment planning. The investment planning applications will require only minor integration with the existing retirement fund management system.

The investment planning applications suite will include one multi-tier web application and two iOS mobile applications. One mobile application will be used by employees; the other will be used by customers.

Litware plans to move to a more agile development methodology. Shared code will be extracted into a series of packages.

Litware has started an internal cloud transformation process and plans to use cloud-based services whenever suitable.

Litware wants to become proactive in detecting failures, rather than always waiting for customer bug reports.

Technical requirements

The company's investment planning applications suite must meet the following requirements:

- New incoming connections through the firewall must be minimized.
- Members of a group named Developers must be able to install packages.
- The principle of least privilege must be used for all permission assignments.
- A branching strategy that supports developing new functionality in isolation must be used.
- Members of a group named Team Leaders must be able to create new packages and edit the permissions of package feeds.
- Visual Studio App Center must be used to centralize the reporting of mobile application crashes and device types in use.
- By default, all releases must remain available for 30 days, except for production releases, which must be kept for 60 days.
- By default, all App Center must be used to centralize the reporting of mobile application crashes and device types in use.
- Code quality and release quality are critical. During release, deployments must not proceed between stages if any active bugs are logged against the release. ▪ The mobile applications must be able to call the share pricing service of the existing retirement fund management system. Until the system is upgraded, the service will only support basic authentication over HTTPS.
- The required operating system configuration for the test servers changes weekly. Azure Automation State Configuration must be used to ensure that the operating system on each test server is configured the same way when the servers are created and checked periodically.

Current Technical Issue

The test servers are configured correctly when first deployed, but they experience configuration drift over time. Azure Automation State Configuration fails to correct the configurations.

Azure Automation State Configuration nodes are registered by using the following command.

```
Register-AzureRmAutomationDscNode
    -ResourceGroupName 'TestResourceGroup'
    -AutomationAccountName 'LitwareAutomationAccount'
    -AzureVMName $vname
    -ConfigurationMode 'ApplyOnly'
```

Implement Dependency Management

Testlet 2

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 question 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. If the case study has an **All Information** tab, note that the information displayed is identical to the information displayed on the subsequent tabs. When you are ready to answer a question, click the **Question** button to return to the question. **Overview**

Contoso, Ltd. is a manufacturing company that has a main office in Chicago.

Existing Environment

Contoso plans to improve its IT development and operations processes by implementing Azure DevOps principles. Contoso has an Azure subscription and creates an Azure DevOps organization.

The Azure DevOps organization includes:

▪ The Docker extension
▪ A deployment pool named Pool7 that contains 10 Azure virtual machines that run Windows Server 2016

The Azure subscription contains an Azure Automation account.

Requirements

Planned changes
Contoso plans to create projects in Azure DevOps as shown in the following table.

Project name	Project details
Project 1	Project1 will provide support for incremental builds and third-party SDK components
Project 2	Project2 will use an automatic build policy. A small team of developers named Team2 will work independently on changes to the project. The Team2 members will not have permissions to Project2.
Project 3	Project3 will be integrated with SonarQube
Project 4	Project4 will provide support for a build pipeline that creates a Docker image and pushes the image to the Azure Container Registry. Project4 will use an existing Dockerfile.
Project 5	Project5 will contain a Git repository in Azure Repos and a continuous integration trigger that will initiate a build in response to any change except for changes within /folder1 of the repository.
Project 6	Project6 will provide support for build and deployment pipelines. Deployment will be allowed only if the number of current work items representing active software bugs is 0.
Project 7	Project7 will contain a target deployment group named Group7 that maps to Pool7. Project7 will use Azure Automation State Configuration to maintain the desired state of the computers in Group7.

Technical requirements

Contoso identifies the following technical requirements:

▪ Implement build agents for Project1.
▪ Whenever possible, use Azure resources.
▪ Avoid using deprecated technologies.
▪ Implement a code flow strategy for Project2 that will:
    - Enable Team2 to submit pull requests for Project2.
    - Enable Team2 to work independently on changes to a copy of Project2.
    - Ensure that any intermediary changes performed by Team2 on a copy of Project2 will be subject to the same restrictions as the ones defined in the build policy of Project2.
▪ Whenever possible, implement automation and minimize administrative effort.
▪ Implement Project3, Project5, Project6, and Project7 based on the planned changes.
▪ Implement Project4 and configure the project to push Docker images to Azure Container Registry.

Implement Dependency Management

Question Set 3

QUESTION 1

You administer an Azure DevOps project that includes package feeds.

You need to ensure that developers can unlist and deprecate packages. The solution must use the principle of least privilege.

Which access level should you grant to the developers?

A. Collaborator
B. Contributor

C. Owner

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Feeds have four levels of access: Owners, Contributors, Collaborators, and Readers. Owners can add any type of identity-individuals, teams, and groups-to any access level.

Permission	Reader	Collaborator	Contributor	Owner
List and restore/install packages	✓	✓	✓	✓
Save packages from upstream sources		✓	✓	✓
Push packages			✓	✓
Unlist/deprecate packages			✓	✓
Promote a package to a view			✓	✓
Delete/unpublish package				✓
Edit feed permissions				✓

Reference: https://docs.microsoft.com/en-us/azure/devops/artifacts/feeds/feed-permissions

QUESTION 2
You plan to share packages that you wrote, tested, validated, and deployed by using Azure Artifacts.

You need to release multiple builds of each package by using a single feed. The solution must limit the release of packages that are in development.

What should you use?

A. local symbols
B. views
C. global symbols
D. upstream sources

Correct Answer: D
Section: (none)
Explanation

Explanation/Reference:
Explanation:

Upstream sources enable you to manage all of your product's dependencies in a single feed. We recommend publishing all of the packages for a given product to that product's feed, and managing that product's dependencies from remote feeds in the same feed, via upstream sources. This setup has a few benefits:

▪ Simplicity: your NuGet.config, .npmrc, or settings.xml contains exactly one feed (your feed).
▪ Determinism: your feed resolves package requests in order, so rebuilding the same codebase at the same commit or changeset uses the same set of packages ▪ Provenance: your feed knows the provenance of packages it saved via upstream sources, so you can verify that you're using the original package, not a custom or malicious copy published to your feed
▪ Peace of mind: packages used via upstream sources are guaranteed to be saved in the feed on first use; if the upstream source is disabled/removed, or the remote feed goes down or deletes a package you depend on, you can continue to develop and build

References: https://docs.microsoft.com/en-us/azure/devops/artifacts/concepts/upstream-sources?view=vsts

QUESTION 3
Your company is concerned that when developers introduce open source libraries, it creates licensing compliance issues.

You need to add an automated process to the build pipeline to detect when common open source libraries are added to the code base.

What should you use?

A. Microsoft Visual SourceSafe
B. PDM
C. WhiteSource
D. OWASP ZAP

Correct Answer: C
Section: (none)
Explanation

Explanation/Reference:
Explanation:
WhiteSource is the leader in continuous open source software security and compliance management. WhiteSource integrates into your build process, irrespective of your programming languages, build tools, or development environments. It works automatically, continuously, and silently in the background, checking the security, licensing, and quality of your open source components against WhiteSource constantly-updated definitive database of open source repositories.

Azure DevOps integration with WhiteSource Bolt will enable you to:

1. Detect and remedy vulnerable open source components.
2. Generate comprehensive open source inventory reports per project or build.
3. Enforce open source license compliance, including dependencies' licenses.
4. Identify outdated open source libraries with recommendations to update.

References: https://www.azuredevopslabs.com/labs/vstsextend/WhiteSource/

QUESTION 4
Your company is concerned that when developers introduce open source libraries, it creates licensing compliance issues.

You need to add an automated process to the build pipeline to detect when common open source libraries are added to the code base.

What should you use?

A. Microsoft Visual SourceSafe
B. Code Style
C. Black Duck
D. Jenkins
E. SourceGea
F. OWASP ZAP

Correct Answer: C
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Secure and Manage Open Source Software
Black Duck helps organizations identify and mitigate open source security, license compliance and code-quality risks across application and container portfolios.
Black Duck Hub and its plugin for Team Foundation Server (TFS) allows you to automatically find and fix open source security vulnerabilities during the build process, so you can proactively manage risk. The integration allows you to receive alerts and fail builds when any Black Duck Hub policy violations are met.

Note: WhiteSource would also be a good answer, but it is not an option here.

Reference: https://marketplace.visualstudio.com/items?itemName=black-duck-software.hub-
tfs

QUESTION 5
You have an Azure DevOps project that contains a build pipeline. The build pipeline uses approximately 50 open source libraries.

You need to ensure that all the open source libraries comply with your company's licensing standards.

Which service should you use?

A. NuGet

B. Maven

C. Black Duck

D. Helm

Correct Answer: C
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Secure and Manage Open Source Software
Black Duck helps organizations identify and mitigate open source security, license compliance and code-quality risks across application and container portfolios.
Black Duck Hub and its plugin for Team Foundation Server (TFS) allows you to automatically find and fix open source security vulnerabilities during the build process, so you can proactively manage risk. The integration allows you to receive alerts and fail builds when any Black Duck Hub policy violations are met.

Note: WhiteSource would also be a good answer, but it is not an option here.

Reference: https://marketplace.visualstudio.com/items?itemName=black-duck-software.hub-tfs

QUESTION 6
You have an Azure DevOps project that contains a build pipeline. The build pipeline uses approximately 50 open source libraries.

You need to ensure that all the open source libraries comply with your company's licensing standards.

Which service should you use?

A. Ansible

B. Maven

C. WhiteSource Bolt

D. Helm

Correct Answer: C
Section: (none)
Explanation

Explanation/Reference:

Explanation:
WhiteSource provides WhiteSource Bolt, a lightweight open source security and management solution developed specifically for integration with Azure DevOps and Azure DevOps Server.

Note: WhiteSource is the leader in continuous open source software security and compliance management. WhiteSource integrates into your build process, irrespective of your programming languages, build tools, or development environments. It works automatically, continuously, and silently in the background, checking the security, licensing, and quality of your open source components against WhiteSource constantly-updated definitive database of open source repositories.

Note: Blackduck would also be a good answer, but it is not an option here.

Reference:
https://www.azuredevopslabs.com/labs/vstsextend/whitesource/

QUESTION 7
Your company develops an application named App1 that is deployed in production.

As part of an application update, a new service is being added to App1. The new service requires access to an application named App2 that is currently in development.

You need to ensure that you can deploy the update to App1 before App2 becomes available. You must be able to enable the service in App1 once App2 is deployed.

What should you do?

A. Implement a feature flag.
B. Create a fork in the build.
C. Create a branch in the build.
D. Implement a branch policy.

Correct Answer: A
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Feature flags support a customer-first DevOps mindset, to enable (expose) and disable (hide) features in a solution, even before they are complete and ready for release.

Incorrect Answers:

C: Branch policies are an important part of the Git workflow and enable you to:
▪ Isolate work in progress from the completed work in your master branch ▪
Guarantee changes build before they get to master

Reference:
https://docs.microsoft.com/en-us/azure/devops/migrate/phase-features-with-feature-flags

QUESTION 8
You are designing the security validation strategy for a project in Azure DevOps.

You need to identify package dependencies that have known security issues and can be resolved by an update.

What should you use?

A. Octopus Deploy
B. Jenkins
C. Gradle
D. SonarQube

Correct Answer: A
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Incorrect Answers:
B: Jenkins is a popular open-source automation server used to set up continuous integration and delivery (CI/CD) for your software projects.

D: SonarQube is a set of static analyzers that can be used to identify areas of improvement in your code. It allows you to analyze the technical debt in your project and keep track of it in the future.

Reference: https://octopus.com/docs/packaging-applications