

**MS-600.28q**

Number: MS-600  
Passing Score: 800  
Time Limit: 120 min

**MS-600**



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**Building Applications and Solutions with Microsoft 365 Core Services**

**Question Set 1**

**QUESTION 1**

You need to develop a server-based web app that will be registered with the Microsoft identity platform. The solution must ensure that the app can perform operations on behalf of the user.



<https://vceplus.com/>

Which type of authorization flow should you use?

- A. authorization code
- B. refresh token
- C. resource owner password
- D. device code

**Correct Answer:** A

**Section:** [none]

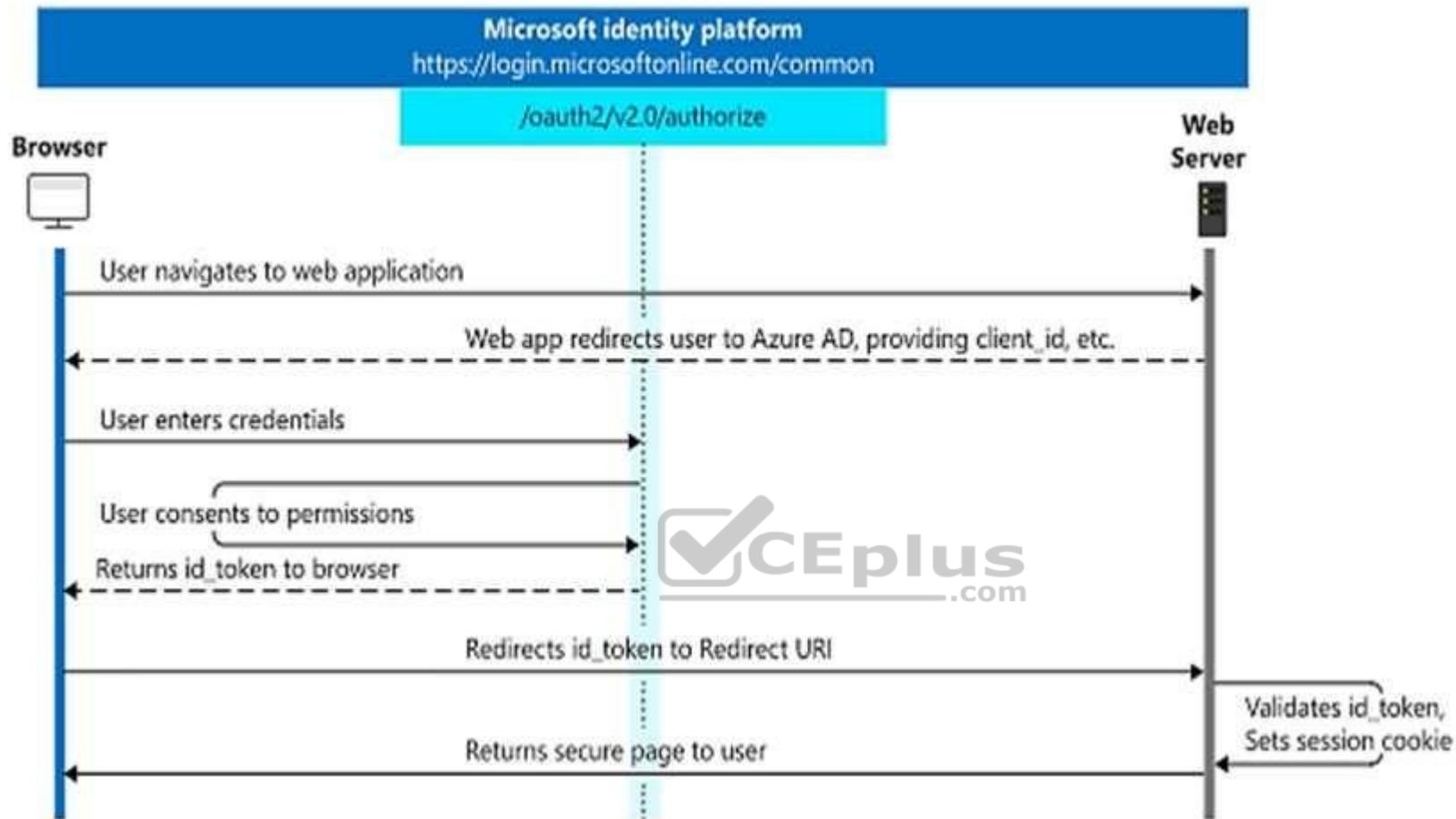
**Explanation**

**Explanation/Reference:**

Explanation:

In web server apps, the sign-in authentication flow takes these high-level steps:





You can ensure the user's identity by validating the ID token with a public signing key that is received from the Microsoft identity platform endpoint. A session cookie is set, which can be used to identify the user on subsequent page requests.

In addition to simple sign-in, a web server app might need to access another web service, such as a REST API. In this case, the web server app engages in a combined OpenID Connect and OAuth 2.0 flow, by using the OAuth 2.0 authorization code flow.

Reference: <https://docs.microsoft.com/en-us/azure/active-directory/develop/v2-app-types>

## QUESTION 2

You have a single-page application (SPA) named TodoListSPA and a server-based web app named TodoListService.

The permissions for the TodoList SPA API are configured as shown in the TodoList SPA exhibit. (Click the TodoListSPA tab.)

API/PERMISSIONS NAME	TYPE	DESCRIPTION	ADMIN CONSENT REQUIRED
▼ TodoListService-OBO-sample-v2 (1)			
user_impersonation	Delegated	Access TodoListService-OBO-sample-v2	

The permissions for the TodoListService API are configured as shown in the TodoListService exhibit. (Click the TodoListService tab.)

API/PERMISSIONS NAME	TYPE	DESCRIPTION
▼ Microsoft Graph (1)		
UserRead	Delegated	Sign in and read user profile

You need to ensure that TodoListService can access a Microsoft OneDrive file of the signed-in user. The solution must use the principle of least privilege.

Which permission should to grant?

- A. the Sites.Read.All delegated permission for TodoListService
- B. the Sites.Read.All delegated permission for TodoListSpa
- C. the Sites.Read.All application permission for TodoListSPA
- D. the Sites.Read.All application permission for TodoListService

**Correct Answer:** A

**Section:** [none]

**Explanation**

**Explanation/Reference:**

Explanation:

A client application gains access to a resource server by declaring permission requests. Two types are available:

"Delegated" permissions, which specify scope-based access using delegated authorization from the signed-in resource owner, are presented to the resource at runtime as "scp" claims in the client's access token.

"Application" permissions, which specify role-based access using the client application's credentials/identity, are presented to the resource at run-time as "roles" claims in the client's access token.

Reference: <https://docs.microsoft.com/en-us/azure/active-directory/develop/developer-glossary#permissions>

### QUESTION 3

You are building a server-based web app that will use OAuth2 and will be registered with the Microsoft identity platform.

Which two values does the app require to obtain tokens from the Azure Active Directory (Azure AD) authorization endpoint? Each correct answer presents part of the solution.

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

- A. the tenant ID
- B. the context token
- C. the application ID
- D. the application secret
- E. the authorization code



**Correct Answer:** CE

**Section:** [none]

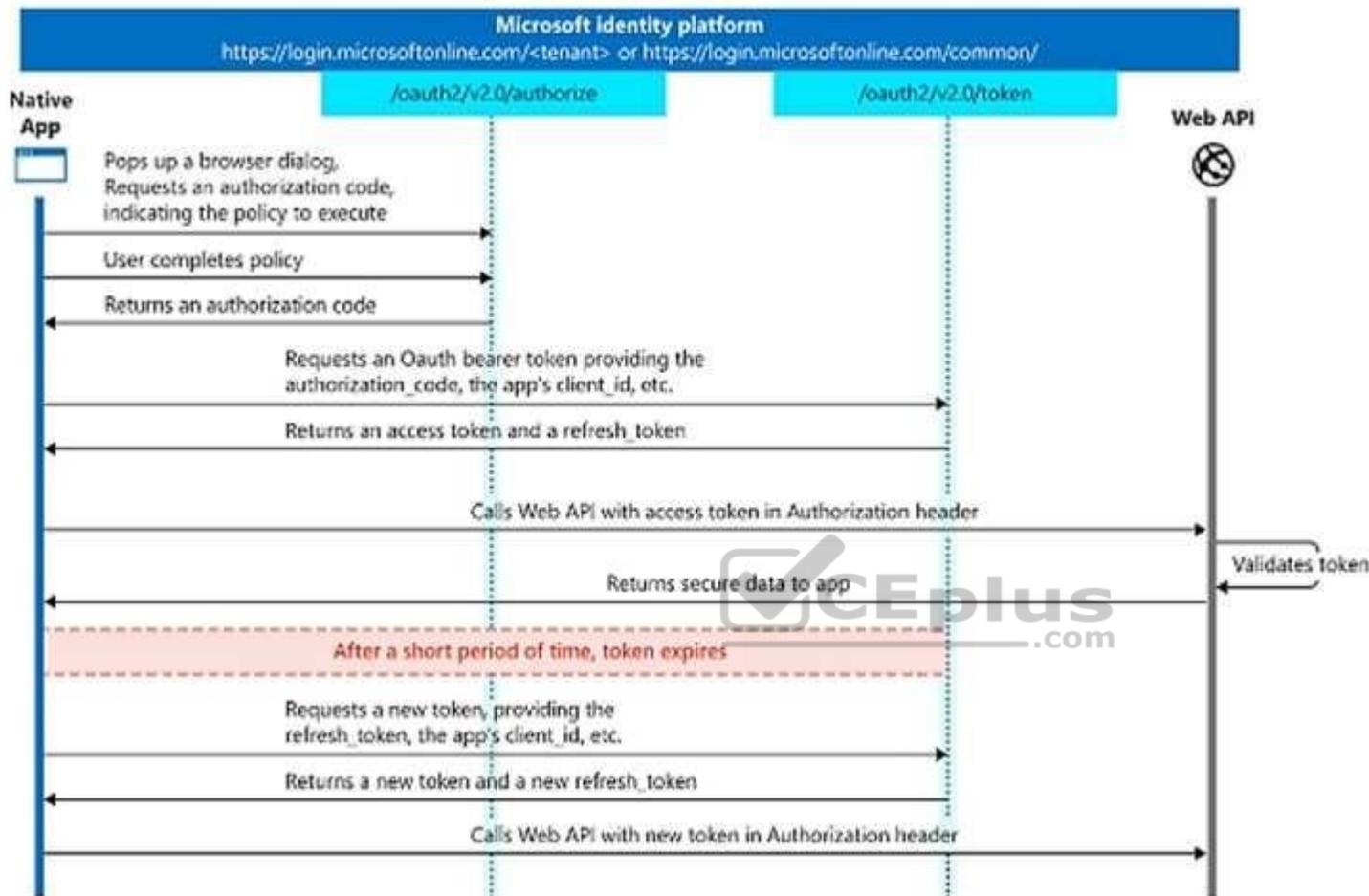
**Explanation**

**Explanation/Reference:**

Explanation:

C: The required client\_id is the Application (client) ID that the Azure portal – App registrations experience assigned to your app.

E: The authorization code flow begins with the client directing the user to the /authorize endpoint.



Reference: <https://docs.microsoft.com/en-us/azure/active-directory/develop/v2-oauth2-auth-code-flow>

#### QUESTION 4

You develop a web API named WebApi1.

When validating a token received from a client application, WebApi1 receives a `MsalUiRequiredException` exception from Azure Active Directory (Azure AD).

You need to formulate the response that WebApi1 will return to the client application.

Which HTTP response should you send?

- A. HTTP 307 Temporary Redirect
- B. HTTP 400 Bad Request
- C. HTTP 403 Forbidden
- D. HTTP 412 Precondition Failed

**Correct Answer:** D

**Section:** [none]

**Explanation**

**Explanation/Reference:**

Explanation:

The HyperText Transfer Protocol (HTTP) 412 Precondition Failed client error response code indicates that access to the target resource has been denied. This happens with conditional requests on methods other than GET or HEAD when the condition defined by the If-Unmodified-Since or If-None-Match headers is not fulfilled. In that case, the request, usually an upload or a modification of a resource, cannot be made and this error response is sent back.

MsalUiRequiredException

The "Ui Required" is proposed as a specialization of MsalServiceException named MsalUiRequiredException. This means you have attempted to use a noninteractive method of acquiring a token (e.g. AcquireTokenSilent), but MSAL could not do it silently. this can be because:

- you need to sign-in
- you need to consent
- you need to go through a multi-factor authentication experience. The remediation is to call AcquireTokenInteractive

```
try
{
    app.AcquireTokenXXX(scopes, account)
        .WithYYYY(...)
        .ExecuteAsync()
}
catch(MsalUiRequiredException ex)
{
    app.AcquireTokenInteractive(scopes)
        .WithAccount(account)
        .WithClaims(ex.Claims)
        .ExecuteAsync();
}
```

Incorrect Answers:

A: A 307 Temporary Redirect message is an HTTP response status code indicating that the requested resource has been temporarily moved to another URI , as indicated by the special Location header returned within the response

B: The 400 Bad Request Error is an HTTP response status code that indicates that the server was unable to process the request sent by the client due to invalid syntax.

C: The 403 Forbidden Error happens when the web page (or other resource) that you're trying to open in your web browser is a resource that you're not allowed to access.

References: <https://docs.microsoft.com/en-us/azure/active-directory/develop/msal-handling-exceptions> <https://github.com/AzureAD/microsoft-authentication-library-for-dotnet/wiki/exceptions>



## Testlet 1

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### To start the case study

To display the first question in this case study, click the **Next** button. Use the buttons in the left pane to explore the content of the case study before you answer the questions. Clicking these buttons displays information such as business requirements, existing environment, and problem statements. 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**

ADatum Corporation develops a software as a service (SaaS) application named E-invoicing.

### Existing Environment

#### Application Architecture

E-invoicing consists of a single-page application (SPA) and a backend web service that provides invoice management and processing functionality.

E-invoicing stores all the details of each invoicing operation in a backend cloud database. E-invoicing generates invoices in PDF format and provides users with the ability to download the PDF after it is generated. Each invoice has a unique identifier named invoiceid.

The users have a common workflow where they sign in to E-invoicing, and then open E-invoicing in multiple tabs of a web browser so they can use different parts of the application simultaneously. **Security Architecture**

ADatum uses the principle of least privilege whenever possible. ADatum always uses the latest libraries and integration endpoints.

#### Requirements

##### Business Goals

ADatum wants to integrate E-invoicing, Azure Active Directory (Azure AD), and Microsoft Graph so that their customers can leverage Microsoft Office 365 services directly from within E-invoicing.

### **Planned Changes**

ADatum plans to add the following capabilities to E-invoicing:

- Email the generated invoices to customers on behalf of the current signed-in user. Any emails generated by the system will contain the invoiceid.
- Perform as many operations as possible in the browser without having to leave the E-invoicing application.
- Use Azure AD to manage identities, authentication, and authorization.
- Display all emails that contain a specific invoiceid.

### **Technical Requirements**

ADatum identifies the following technical requirements for the planned E-invoicing capabilities:

- Ensure that all operations performed by E-invoicing against Office 365 are initiated by a user. Require that the user authorize E-invoicing to access the Office 365 data the first time the application attempts to access Office 365 data on the user's behalf.
  - Send scheduled reminders to customers before a payment due date. Create an administration user interface to enable the scheduled reminders.
  - Implement Microsoft Graph change notifications to detect emails from vendors that arrive in a designated mailbox.
  - Implement single sign-on (SSO) and minimize login prompts across browser tabs.
  - Secure access to the backend web service by using Azure AD.
- Ensure that all solutions use secure coding practices.

### **Backend Security Planned Changes**

ADatum wants to use custom application roles to map user functionality to permissions granted to users.

E-invoicing will have internal logic that will dynamically identify whether the user should be allowed to call the backend API.

### **SSO JavaScript Script**

You plan to implement SSO with Microsoft Authentication Library (MSAL) by using the following code:

```
01 const config ={
02   auth: {
03     clientId: '3b41e6eb-29a1-44cc-8473-e8abfe5c4e07'
04   },
05   cache: {
06     ...
07   }
08 }
09 const myMSALObj = new UserAgentApplication(config);
10 ...
```

### Access Token JavaScript Script

You have the following JavaScript code to obtain an access token.

```
01 ...
02 userAgentApplication.acquireTokenSilent(accessTokenRequest).then(
03   function(accessTokenResponse) {
04     let accessToken = accessTokenResponse.accessToken;
05   }).catch(function (error) {
06     if (error.errorMessage.indexOf('interaction_required') !== -1) {
07       userAgentApplication.acquireTokenPopup(accessTokenRequest).then(
08         function(accessTokenResponse) {
09           ...
10         }).catch(function(error) {
11           console.log(error);
12         });
13     }
14     console.log(error);
15 });
```

### Change Notification JSON

You have the following JSON message that will be sent by the Microsoft Graph service to detect the vendor emails.

```
01 {
02   "value": [
03     {
04       "subscriptionId": "<subscription_guid>"
05       "subscriptionExpirationDateTime": "<expirationdate>",
06       "clientState": "<secret>",
07       "changeType": "created",
08       "resource":
09         "users/<user_guid>@<tenant_guid>/messages/<long_id_string>",
10       "resourceData":
11         {
12           "@odata.type": "#Microsoft.Graph.Message",
13           "@odata.id": "Users/<user_guid>@<tenant_guid>/Messages/<long_id_string>",
14           "@odata.etag": "W/\"CQAAABYAAADkrWGo7bouTKlsgTZMr9KwAAAUWRHf\"",
15           "id": "<long_id_string>"
16         }
17     }
18 ]
19 }
```



### QUESTION 1

How can you validate that the JSON notification message is sent from the Microsoft Graph service?

- A. The ClientState must match the value provided when subscribing.
- B. The user\_guid must map to a user ID in the Azure AD tenant of the customer.
- C. The tenant ID must match the tenant ID of the customer's Office 365 tenant.
- D. The subscription ID must match the Azure subscription used by ADatum.

**Correct Answer:** A

**Section:** [none]

**Explanation**

**Explanation/Reference:**

**Explanation:**

clientState specifies the value of the clientState property sent by the service in each notification. The maximum length is 128 characters. The client can check that the notification came from the service by comparing the value of the clientState property sent with the subscription with the value of the clientState property received with each notification.

**Note:** A subscription allows a client app to receive notifications about changes to data in Microsoft Graph.

**Reference:** <https://docs.microsoft.com/en-us/graph/api/resources/subscription>



## Question Set 2

### QUESTION 1

You have an application that uses the Microsoft Graph API.

You need to configure the application to retrieve the groups to which the current signed-in user belongs. The results must contain the extended priorities of the groups.

Which URI should you use?

- A. <https://graph.microsoft.com/v1.0/me/getMemberObjects>
- B. <https://graph.microsoft.com/v1.0/me/getMemberGroups>
- C. <https://graph.microsoft.com/v1.0/me/memberOf>
- D. <https://graph.microsoft.com/v1.0/me/checkMemberGroups>

**Correct Answer:** B

**Section:** [none]

**Explanation**

**Explanation/Reference:**

Explanation:

Get member groups returns all the groups that the specified user, group, or directory object is a member of. This function is transitive.

Reference: <https://docs.microsoft.com/en-us/graph/api/directoryobject-getmembergroups>

### QUESTION 2

DRAG DROP

You are developing a web app that will display emails from the Microsoft 365 mailbox of the current signed-in user.

For performance reasons, you do not want all the emails to be loaded simultaneously, rather page-by-page as the user navigates the app.

You plan to display 30 emails per page. The most recent emails must be displayed first.

How should you complete the query parameters for the REST request to display the third page of emails? To answer, drag the appropriate query parameters to the correct targets. Each query parameter may be used once, more than once, or not at all. You may need to drag the split bar between panes or scroll to view content.

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

**Select and Place:**

Actions	Answer Area
filter	GET https://graph.microsoft.com/v1.0/me/messages?\$
search	Parameter: =@&\$
select	Parameter: -30&\$orderby=-sentDateTime desc
skip	
top	

**Correct Answer:**

Actions	Answer Area
filter	GET https://graph.microsoft.com/v1.0/me/messages?\$
search	top
select	=@&\$
skip	skip
top	-30&\$orderby=-sentDateTime desc



**Section: [none]**

**Explanation**

**Explanation/Reference:**

Explanation:

Box 1: top

Number of items to return in a result

Box 2: skip

\$skip Indexes into a result set. Also used by some APIs to implement paging and can be used together with \$top to manually page results.

Incorrect Answers:

- \$select

To specify a different set of properties to return than the default set provided by the Graph, use the \$select query option. The \$select option allows for choosing a subset or superset of the default set returned. For example, when retrieving your messages, you might want to select that only the from and subject properties of messages are returned.

- \$search

To restrict the results of a request that match a search criterion, use the \$search query parameter. You cannot use \$filter or \$orderby in a \$search request.

Reference: [https://developer.microsoft.com/en-us/graph/docs/overview/query\\_parameters](https://developer.microsoft.com/en-us/graph/docs/overview/query_parameters)

### QUESTION 3

You are developing a human resources application that will show users where they are in their company's organization chart.

You are adding a new feature that will display the name of a user's manager inside the application.

You need to create a REST query to retrieve the information. The solution must minimize the amount of data retrieved.

Which query should you use?

- A. GET `https://graph.microsoft.com/v1.0/users/{UserPrincipalName}/manager?$select=displayName`
- B. GET `https://graph.microsoft.com/v1.0/users/{UserPrincipalName}/people?$filter=jobTitle eq 'manager'&$select=displayName`
- C. GET `https://graph.microsoft.com/v1.0/users/{UserPrincipalName}/contacts?$filter=jobTitle eq 'manager'`
- D. GET `https://graph.microsoft.com/v1.0/users/{UserPrincipalName}/manager`

**Correct Answer:** A

**Section:** [none]

**Explanation**

**Explanation/Reference:**

Explanation:

Get user's manager. Returns the user or organizational contact assigned as the user's manager.

Syntax:

GET /me/manager

GET /users/{id | userPrincipalName}/manager

Only the name of the user's manager should be displayed so we use ?select=displayname

To specify a different set of properties to return than the default set provided by the Graph, use the \$select query option. The \$select option allows for choosing a subset or superset of the default set returned.

References: <https://docs.microsoft.com/en-us/graph/api/user-list-manager> [https://developer.microsoft.com/en-us/graph/docs/overview/query\\_parameters](https://developer.microsoft.com/en-us/graph/docs/overview/query_parameters)

#### QUESTION 4

You are developing an application that will track changes to the UserPrincipalName attribute of Microsoft 365 accounts.

You need to use a REST request to retrieve the information by using Microsoft Graph. The solution must minimize the amount of data retrieved.

What should you do?

- A. Use GET `https://graph.microsoft.com/v1.0/users/delta` for the first call. Use the state token in subsequent calls.
- B. Use GET `https://graph.microsoft.com/v1.0/users/delta?$select=UserPrincipalName` for the first call. Use the state token in subsequent calls.
- C. Use GET `https://graph.microsoft.com/v1.0/users$select=UserPrincipalName` for the calls and track the changes.
- D. Use GET `https://graph.microsoft.com/v1.0/users` for the calls and track the changes.

**Correct Answer: B**

**Section: [none]**

**Explanation**



#### Explanation/Reference:

Explanation:

Use delta query to track changes in a resource collection

The typical call pattern is as follows: application begins by calling a GET request with the delta function on the desired resource.

1. Microsoft

1. The Graph sends a response containing the requested resource and a state token.

Example: Selecting three properties

The next example shows the initial request selecting three properties for change tracking, with default response behavior.

Note: Delta query enables applications to discover newly created, updated, or deleted entities without performing a full read of the target resource with every request.

Incorrect Answers:

A: Example: Default properties

The following is an example of the request. There is no \$select parameter, so a default set of properties is tracked and returned.

Reference: <https://docs.microsoft.com/en-us/graph/api/user-delta>

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ADatum Corporation develops a software as a service (SaaS) application named E-invoicing.

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#### Application Architecture

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ADatum wants to integrate E-invoicing, Azure Active Directory (Azure AD), and Microsoft Graph so that their customers can leverage Microsoft Office 365 services directly from within E-invoicing.

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ADatum plans to add the following capabilities to E-invoicing:

- Email the generated invoices to customers on behalf of the current signed-in user. Any emails generated by the system will contain the invoiceid.
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- Use Azure AD to manage identities, authentication, and authorization.
- Display all emails that contain a specific invoiceid.

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ADatum identifies the following technical requirements for the planned E-invoicing capabilities:

- Ensure that all operations performed by E-invoicing against Office 365 are initiated by a user. Require that the user authorize E-invoicing to access the Office 365 data the first time the application attempts to access Office 365 data on the user's behalf.
  - Send scheduled reminders to customers before a payment due date. Create an administration user interface to enable the scheduled reminders.
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E-invoicing will have internal logic that will dynamically identify whether the user should be allowed to call the backend API.

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You plan to implement SSO with Microsoft Authentication Library (MSAL) by using the following code:

```
01 const config ={
02   auth: {
03     clientId: '3b41e6eb-29a1-44cc-8473-e8abfe5c4e07'
04   },
05   cache: {
06     ...
07   }
08 }
09 const myMSALObj = new UserAgentApplication(config);
10 ...
```

### Access Token JavaScript Script

You have the following JavaScript code to obtain an access token.

```
01 ...
02 userAgentApplication.acquireTokenSilent(accessTokenRequest).then(
03   function(accessTokenResponse) {
04     let accessToken = accessTokenResponse.accessToken;
05   }).catch(function (error) {
06     if (error.errorMessage.indexOf('interaction_required') !== -1) {
07       userAgentApplication.acquireTokenPopup(accessTokenRequest).then(
08         function(accessTokenResponse) {
09           ...
10         }).catch(function(error) {
11           console.log(error);
12         });
13     }
14     console.log(error);
15 });
```

### Change Notification JSON

You have the following JSON message that will be sent by the Microsoft Graph service to detect the vendor emails.

```
01 {
02   "value": [
03     {
04       "subscriptionId": "<subscription_guid>"
05       "subscriptionExpirationDateTime": "<expirationdate>",
06       "clientState": "<secret>",
07       "changeType": "created",
08       "resource":
09         "users/<user_guid>@<tenant_guid>/messages/<long_id_string>",
10       "resourceData":
11         {
12           "@odata.type": "#Microsoft.Graph.Message",
13           "@odata.id": "Users/<user_guid>@<tenant_guid>/Messages/<long_id_string>",
14           "@odata.etag": "W/\\"CQAAABYAAADkrWGo7bouTKlsgTZMr9KwAAAUWRHf\\"",
15           "id": "<long_id_string>"
16         }
17     }
18 ]
19 }
```



### QUESTION 1

Which type of authentication flow should you recommend for the planned integration with Office 365?

- A. device code
- B. implicit grant
- C. authorization code



<https://vceplus.com/> D. client

credentials

**Correct Answer:** C

**Section:** [none]

**Explanation**

**Explanation/Reference:**

Explanation:

To use Microsoft Graph to read and write resources on behalf of a user, your app must get an access token from the Microsoft identity platform and attach the token to requests that it sends to Microsoft Graph.

One common flow used by native and mobile apps and also by some Web apps is the OAuth 2.0 authorization code grant flow.

Scenario: Email the generated invoices to customers on behalf of the current signed-in user. Any emails generated by the system will contain the invoiced. Use Azure AD to manage identities, authentication, and authorization.

Reference: <https://docs.microsoft.com/en-us/graph/auth-v2-user>

## Question Set 2

### 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 have more than one correct solution, while others might not have a correct solution.

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

You are developing a new application named App1 that uses the Microsoft identity platform to authenticate to Azure Active Directory (Azure AD).

Currently, App1 can read user profile information.

You need to allow App1 to read the user's calendar.

Solution: In the code of App1, dynamically request the Calendar.Read permission from the Microsoft Graph API.

Does this meet the goal?

- A. Yes
- B. No

**Correct Answer:** B  
**Section:** [none]  
**Explanation**



#### **Explanation/Reference:**

Explanation:

For your app to access data in Microsoft Graph, the user or administrator must grant it the correct permissions via a consent process.

Application permissions can only be consented by an administrator.

References: <https://docs.microsoft.com/en-us/azure/active-directory/develop/v2-permissions-and-consent> <https://docs.microsoft.com/en-us/graph/permissions-reference>

### QUESTION 2

You plan to deploy a SharePoint Framework (SPFx) solution to the tenant app catalog.

Which attribute should you configure in the package-solution.json file to ensure that the solution is available immediately to all site collections?

- A. skipFeatureDeployment
- B. zippedPackage
- C. ClientSideComponentId
- D. isDomainIsolated

**Correct Answer:** A

**Section:** [none]

**Explanation**

**Explanation/Reference:**

Explanation:

You can configure your SharePoint Framework components to be immediately available across the tenant when the solution package is installed to the tenant app catalog. This can be configured by using the skipFeatureDeployment attribute in the package-solution.json file.

Reference: <https://docs.microsoft.com/en-us/sharepoint/dev/spfx/tenant-scoped-deployment>

### QUESTION 3

What should you add to a SharePoint Framework (SPFx) solution to ensure that the solution can be used as a Microsoft Teams tab?

- A. the TeamsTab value to the componentType property in the manifest file
- B. a manifest file to the Teams folder in the solution
- C. the TeamsTab value to the supportedHosts property in the manifest file
- D. a manifest file to the webparts folder in the solution

**Correct Answer:** D

**Section:** [none]

**Explanation**

**Explanation/Reference:**

Explanation:

You need to update the web part manifest to make it available for Microsoft Teams. Locate the manifest json file for the web part you want to make available to Teams and modify the supportedHosts properties to include "TeamsTab".

Reference: <https://docs.microsoft.com/en-us/sharepoint/dev/spfx/web-parts/get-started/using-web-part-as-ms-teams-tab>

### QUESTION 4

You have a line-of-business API that is secured by using Azure Active Directory (Azure AD).

You deploy a solution to the app catalog. The solution requests permission to the API.

What should you do in the SharePoint admin center to ensure that the solution can access the API?

- A. Create a SharePoint security group and add the solution
- B. Create an access policy
- C. Enable sandbox solutions
- D. Approve a pending permission request

**Correct Answer:** D

**Section:** [none]

**Explanation**

**Explanation/Reference:**

Explanation:

Developers building a SharePoint Framework solution that requires access to specific resources secured with Azure AD list these resources along with the required permission scopes in the solution manifest. When deploying the solution package to the app catalog, SharePoint creates permission requests and prompts the administrator to manage the requested permissions. For each requested permission, tenant administrators can decide whether they want to grant or deny the specific permission.

All permissions are granted to the whole tenant and not to a specific application that has requested them. When the tenant administrator grants a specific permission, it is added to the SharePoint Online Client Extensibility Azure AD application, which is provisioned by Microsoft in every Azure AD and which is used by the SharePoint Framework in the OAuth flow to provide solutions with valid access tokens.

#### **QUESTION 5**

You are designing a custom SharePoint Framework (SPFx) web part that will be deployed to modern Microsoft SharePoint sites.

You need to ensure that all the web part fields and controls adopt the theme of the site when you deploy the web part.

What should you use to develop the web part?

- A. Material-UI
- B. Office UI Fabric React
- C. HTML 5.0 and CSS
- D. Fluid Framework

**Correct Answer:** B

**Section:** [none]

**Explanation**

**Explanation/Reference:**

Explanation:

Office UI Fabric is Microsoft's official front end framework for building User Interface experiences for Office and Office 365. In simple terms it gives you the look and feel for your component. Moreover, they are open source, mobile responsive and reusable, no need to create from scratch just refer them in your code and start utilizing them.

Microsoft modern SharePoint out of the box webparts are made up these Office UI Fabric framework, so to maintain consistency look and feel as like Office it's better to use these components in our custom SPFx webparts.

Incorrect Answers:

D: At Build 2019 [November 2019], Microsoft announced Fluid Framework, a new technology and set of experiences that will make collaboration seamless by breaking down the barriers between apps. It offers three key capabilities. First, experiences powered by the Fluid Framework will support multi-person coauthoring on web and document content at industry-leading speed and scale. Second, it provides a componentized document model that allows authors to deconstruct content into collaborative building blocks, use them across applications, and combine them in a new, more flexible kind of document. Third, the Fluid Framework makes room for intelligent agents to work alongside humans to translate text, fetch content, suggest edits, perform compliance checks, and more.

Reference: <http://www.sharepointsamples.com/sharepoint-framework-webpart-with-office-ui-fabric-react-component/>

**QUESTION 6****HOTSPOT**

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

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

**Hot Area:**

**Answer Area**

Statements	Yes	No
Microsoft SharePoint solutions that contain isolated web parts can be uploaded to the tenant app catalog.	<input type="radio"/>	<input type="radio"/>
Isolated web parts and non-isolated web parts can communicate with the Microsoft SharePoint REST API in the same way.	<input type="radio"/>	<input type="radio"/>
A non-isolated web part can be changed to an isolated web part.	<input type="radio"/>	<input type="radio"/>

Correct Answer:

Answer Area

Statements	Yes	No
Microsoft SharePoint solutions that contain isolated web parts can be uploaded to the tenant app catalog.	<input checked="" type="radio"/>	<input type="radio"/>
Isolated web parts and non-isolated web parts can communicate with the Microsoft SharePoint REST API in the same way.	<input checked="" type="radio"/>	<input type="radio"/>
A non-isolated web part can be changed to an isolated web part.	<input checked="" type="radio"/>	<input type="radio"/>

Section: [none]

Explanation

Explanation/Reference:

Explanation:



Box 1: Yes

Using the isolated web parts capability, you can build web parts that securely communicate with APIs secured with Azure AD without exposing the access token to other components on the page or even scripts in the tenant.

When deploying these solutions to the app catalog, all API permission requests are specified as isolated.

Box 2: Yes

Even though on runtime isolated web parts will be loaded inside an iframe pointing to a unique domain, you can communicate with SharePoint REST API, the same way as you would in non-isolated web parts.

Box 3: Yes

If you're upgrading an existing SharePoint Framework project to v1.8.0 and want to use the isolated permissions capability, you can do it, by setting in the config/package-solution.json file, the isDomainIsolated property to true. You should ensure, that your project contains only web parts.

After changing the project to use isolated permissions, you should redeploy your project. This will issue new API permission requests, isolated to your solution, which will need to be approved by the tenant admin.

Reference: <https://docs.microsoft.com/en-us/sharepoint/dev/spfx/web-parts/isolated-web-parts>

### QUESTION 7

You have a SharePoint Framework (SPFx) 1.5 solution.

You need to ensure that the solution can be used as a tab in Microsoft Teams.

What should you do first?

- A. Convert the solution to use the Bot Framework
- B. Deploy the solution to a developer site collection
- C. Deploy the solution to the Microsoft AppSource store
- D. Upgrade the solution to the latest version of SPFx

**Correct Answer:** D

**Section:** [none]

**Explanation**

**Explanation/Reference:**

Explanation:

Starting with the SharePoint Framework v1.8, you can implement your Microsoft Teams tabs using SharePoint Framework.

Reference: <https://docs.microsoft.com/en-us/sharepoint/dev/spfx/web-parts/get-started/using-web-part-as-ms-teams-tab>

### QUESTION 8

You have an API that is secured by using Azure Active Directory (Azure AD).

You are designing a SharePoint Framework (SPFx) solution.

Which object should you use to connect to the API from the solution?

- A. SPHttpClient
- B. HttpClient
- C. AadHttpClient

**Correct Answer:** C

**Section:** [none]

**Explanation**

**Explanation/Reference:**

Explanation:

By using the AadHttpClient, you can easily connect to APIs secured by using Azure AD without having to implement the OAuth flow yourself.

Reference: <https://docs.microsoft.com/en-us/sharepoint/dev/spfx/use-aadhttpclient>

### QUESTION 9

What is the default permission scope when you request an access token by using MSGraphClient?

- A. User.Read
- B. People.Read.All
- C. People.Read
- D. User.Read.All

**Correct Answer: D**

**Section: [none]**

**Explanation**

**Explanation/Reference:**

Explanation:

By default, the service principal has no explicit permissions granted to access the Microsoft Graph. However, if you request an access token for the Microsoft Graph, you get a token with the user\_impersonation permission scope that can be used for reading information about the users (that is, User.Read.All).

Reference: <https://docs.microsoft.com/en-us/sharepoint/dev/spfx/use-msgraph>

## Question Set 1

### QUESTION 1

You are designing a Microsoft Teams application. The application will enable content authors to start conversations about news coming from a third-party application.

Which development technique should you use?

- A. incoming webhooks
- B. outgoing webhooks
- C. activity feeds
- D. deep links

**Correct Answer:** D

**Section:** [none]

**Explanation**

**Explanation/Reference:**

Explanation:

Create deep links to content and features in Microsoft Teams.

You can create links to information and features within the Teams client. Examples of where this may be useful:

- Your app automates or simplifies certain user tasks, such as creating a chat or scheduling a meeting, by pre-populating the deep links with required parameters. This avoids the need for users to manually enter information.
- Navigating the user to content within one of your app's tabs.

Incorrect Answers:

A: Incoming webhooks are the simplest type of connector. Connectors allow users to subscribe to receive notifications and messages from your web services

B: Outgoing webhooks allow your users to send text messages from a channel to your web services. Once configured, your users will be able to @mention your outgoing webhook.

C: The activity feed in Microsoft Teams is the user's single inbox for all activity across Teams. The feed aggregates important content.

Reference: <https://docs.microsoft.com/en-us/microsoftteams/platform/concepts/build-and-test/deep-links>

### QUESTION 2

HOTSPOT

You are evaluating deep links in Microsoft Teams.

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

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

**Hot Area:**

**Answer Area**

Statements	Yes	No
Deep links are used to create shorter links for users to remember and navigate.	<input type="radio"/>	<input type="radio"/>
Deep links enable users to navigate to content within the tab of an application to view more details.	<input type="radio"/>	<input type="radio"/>
Deep links can create private chats between users by specifying the set of participants.	<input type="radio"/>	<input type="radio"/>

**Correct Answer:**

**Answer Area**



Statements	Yes	No
Deep links are used to create shorter links for users to remember and navigate.	<input type="radio"/>	<input checked="" type="radio"/>
Deep links enable users to navigate to content within the tab of an application to view more details.	<input checked="" type="radio"/>	<input type="radio"/>
Deep links can create private chats between users by specifying the set of participants.	<input checked="" type="radio"/>	<input type="radio"/>

**Section:** [none]

**Explanation**

**Explanation/Reference:**

Explanation:

Box 1: No

Box 2: Yes

Box 3: Yes

You can create links to information and features within the Teams client. Examples of where this may be useful:

- Navigating the user to content within one of your app's tabs. For instance, your app may have a bot that sends messages notifying the user of an important activity. When the user taps on the notification, the deep link navigates to the tab so the user can view more details about the activity.
- Your app automates or simplifies certain user tasks, such as creating a chat or scheduling a meeting, by pre-populating the deep links with required parameters. This avoids the need for users to manually enter information.

Reference: <https://docs.microsoft.com/en-us/microsoftteams/platform/concepts/build-and-test/deep-links>

### QUESTION 3

Your company has a third-party invoicing web app.

You need to display the app within Microsoft Teams for one user only. The app will not require conversational interactions.

How should you display the app by using the minimum amount of effort?

- A. Instruct the user to add a website tab
- B. Instruct the user to add an App Studio app
- C. Create a SharePoint Framework (SPFx) web part
- D. Create a search-based messaging extension

**Correct Answer:** A

**Section:** [none]

**Explanation**

**Explanation/Reference:**

Explanation:

There are currently three methods of app integration in Teams: Connectors, Bots, and Tabs. Tabs offer more extensive integration by allowing you to view entire third-party services within Microsoft Teams.

Reference: <https://www.sherweb.com/blog/office-365/o365-microsoft-teams-apps/>

### QUESTION 4

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

You can use App Studio for Microsoft Teams to develop all the components of a bot application.

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

- A. No change is needed
- B. configure a Teams tab in an application
- C. develop a SharePoint Framework (SPFx) web part
- D. provision a bot by using the Bot Framework

**Correct Answer:** B

**Section:** [none]

**Explanation**

**Explanation/Reference:**

Explanation:

Tabs provide a place for you to display for rich interactive web content. You can define both personal and team tabs.

There can be only 1 team tab per app, but up to 16 personal tabs per app.

Incorrect Answers:

D: Bots that you create in Microsoft Bot Framework can be specified in an App manifest and included as Teams Apps.

Reference: <https://blog.thoughtstuff.co.uk/2019/04/what-is-app-studio-in-microsoft-teams-and-why-do-i-care/>

### **QUESTION 5**

You plan to integrate a web-based support ticketing system and Microsoft Teams.

You need to recommend a solution that will prompt users for specific information before a ticket is created. The solution must minimize development effort.

What should you include in the recommendation?

- A. outgoing webhooks
- B. incoming webhooks
- C. a notification-only bot
- D. a conversational bot

**Correct Answer:** A

**Section:** [none]

**Explanation**

**Explanation/Reference:**

Explanation:

Webhooks are a great way for Teams to integrate with external apps. A webhook is essentially a POST request sent to a callback URL. In Teams, outgoing webhooks provide a simple way to allow users to send messages to your web service without having to go through the full process of creating bots via the Microsoft Bot Framework. Outgoing webhooks post data from Teams to any chosen service capable of accepting a JSON payload. Once an outgoing webhook is added to a team, it acts like bot, listening in channels for messages using @mention, sending notifications to external web services, and responding with rich messages that can include cards and images.

Reference: <https://docs.microsoft.com/en-us/microsoftteams/platform/webhooks-and-connectors/how-to/add-outgoing-webhook>



## Question Set 1

### QUESTION 1

You need to develop an add-in for Microsoft Excel that can be used from the Windows, Mac, and web versions of Excel.

What are two ways to develop the add-in? Each correct answer presents a complete solution?

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

- A. From Microsoft Teams, install App Studio
- B. From Microsoft Visual Studio that has the Microsoft Office/SharePoint development workload installed, create a new project that uses a Web Add-in template
- C. From the Microsoft Office 365 portal, use Microsoft PowerApps
- D. Use the Yeoman generator for Microsoft Office Add-ins to create the project, and then open the project in Microsoft Visual Studio Code
- E. From Microsoft Visual Studio that has the Microsoft Office/SharePoint development workload installed, create a new project that uses a Visual Studio Tools for Office (VSTO) template

**Correct Answer:** DE

**Section:** [none]

**Explanation**

**Explanation/Reference:**

Explanation:

D: Run the following command to create an add-in project using the Yeoman generator:

```
yo office
```

Visual Studio Code is a great tool to help you develop your custom Office Add-ins regardless if they are for Outlook, Word, Excel, PowerPoint and run in the web clients, Windows clients, iOS clients or on macOS.

Open the project in Visual Studio Code by entering the following on the command line from within the same folder where you ran the generator:

```
code.
```

E: You can create VSTO Add-ins for Excel.

To create a new Excel VSTO Add-in project in Visual Studio

2. Start Visual Studio.
3. On the File menu, point to New, and then click Project.
4. In the templates pane, expand Visual C# or Visual Basic, and then expand Office/SharePoint.
5. Under the expanded Office/SharePoint node, select the Office Add-ins node.
6. In the list of project templates, select Excel 2010 Add-in or Excel 2013 Add-in.



7. In the Name box, type FirstExcelAddIn.
8. Click OK.

Visual Studio creates the FirstExcelAddIn project and opens the ThisAddIn code file in the editor.

References: <https://docs.microsoft.com/en-us/office/dev/add-ins/tutorials/excel-tutorial>

[https://code.visualstudio.com/docs/other/office#\\_use-visual-studio-code-to-develop-your-office-addin](https://code.visualstudio.com/docs/other/office#_use-visual-studio-code-to-develop-your-office-addin)

<https://docs.microsoft.com/en-us/visualstudio/vsto/walkthrough-creating-your-first-vsto-add-in-for-excel>

## QUESTION 2

You have a custom Microsoft Word add-in that was written by using Microsoft Visual Studio Code.

A user reports that there is an issue with the add-in.

You need to debug the add-in for Word Online.

What should you do before you begin debugging in Visual Studio Code?

- A. Disable script debugging in your web browser
- B. Sideload the add-in
- C. Publish the manifest to the Microsoft SharePoint app catalog
- D. Add the manifest path to the trusted catalogs



**Correct Answer: C**

**Section: [none]**

**Explanation**

**Explanation/Reference:**

Explanation:

Debug your add-in from Excel or Word on the web To debug your add-in by using Office on the web (see step 3):

9. Deploy your add-in to a server that supports SSL.

10. In your add-in manifest file, update the SourceLocation element value to include an absolute, rather than a relative, URI.

11. Upload the manifest to the Office Add-ins library in the app catalog on SharePoint.

12. Launch Excel or Word on the web from the app launcher in Office 365, and open a new document.

13. On the Insert tab, choose My Add-ins or Office Add-ins to insert your add-in and test it in the app.

14. Use your favorite browser tool debugger to debug your add-in.

Reference: <https://docs.microsoft.com/en-us/office/dev/add-ins/testing/debug-add-ins-in-office-online>

### QUESTION 3

You are developing a new Microsoft Office Add-in to integrate a corporate invoicing system and Microsoft Excel.

You need to add a new button to the Office ribbon.

What should you add to the add-in?

- A. a task pane
- B. a dialog
- C. a custom function
- D. a command

**Correct Answer:** D

**Section:** [none]

**Explanation**

**Explanation/Reference:**

Explanation:

Add commands to a custom group

1. In the Customize the Ribbon window under the Customize the Ribbon list, click the custom group that you want to add a command to.
2. In the Choose commands from list, click the list you want to add commands from, for example, Popular Commands or All Commands.



3. Click a command in the list that you choose.
4. Click Add.

5. To see and save your changes, click OK.

Reference: <https://support.office.com/en-us/article/customize-the-ribbon-in-office-00f24ca7-6021-48d3-9514-a31a460ecb31>

#### QUESTION 4

You are building a Microsoft Outlook Web Add-in.

You need to persist user preferences between devices by using the minimum amount of development effort.

Which API should you use?

- A. the Microsoft Graph API
- B. the REST API for the Blob service
- C. the JavaScript API for Microsoft Office
- D. the Table service REST API

**Correct Answer:** C

**Section:** [none]

**Explanation**

**Explanation/Reference:**

Explanation:

You can persist add-in state and settings with the JavaScript API for Office.

The JavaScript API for Office provides the Settings, RoamingSettings, and CustomProperties objects for saving add-in state across sessions

Reference: <https://docs.microsoft.com/en-us/office/dev/add-ins/develop/persisting-add-in-state-and-settings>



<https://vceplus.com/>