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Specific information for this practical exam

During the exam, the supervisor (not the invigilator) must do the experiments in Questions 1 and 2 and record the results on a spare copy of the question paper, clearly labelled 'supervisor's results'.

Materials and apparatus for Question 1

Each candidate will require the following materials and apparatus. Labels do **not** need to include concentrations.

hazard	materials and apparatus	per candidate	label
	aqueous iron(III) nitrate of concentration 0.10 mol/dm^3 This solution must be made up freshly using distilled water and not stored. Do not heat the solution when dissolving the iron(III) nitrate. Do not acidify the solution.	300 cm ³	aqueous iron(III) nitrate for Question 1
	aqueous sodium thiosulfate of concentration 1.0 mol/dm^3 This solution must be made up freshly and not stored. Sodium thiosulfate should be dissolved in distilled water which has been boiled and allowed to cool.	70 cm ³	aqueous sodium thiosulfate for Question 1
	stop-watch or timer which can measure to an accuracy of 1 s		
	100 cm ³ beaker	1	
	50 cm ³ measuring cylinder	1	
	25 cm ³ measuring cylinder	1	
	10 cm ³ measuring cylinder	1	
	stirring rod	1	
	dropping pipettes		
	access to water and distilled water		

N.B. Small amounts of SO₂, [C][T], which can cause respiratory distress in some people, may be produced. The laboratory must be well ventilated.

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them wherever you go.

Appian Lead Developer Sample Questions (Q11-Q16):

NEW QUESTION # 11

An existing integration is implemented in Appian. Its role is to send data for the main case and its related objects in a complex JSON to a REST API, to insert new information into an existing application. This integration was working well for a while. However, the customer highlighted one specific scenario where the integration failed in Production, and the API responded with a 500 Internal Error code. The project is in Post- Production Maintenance, and the customer needs your assistance. Which three steps should you take to troubleshoot the issue?

- A. Ensure there were no network issues when the integration was sent.
- B. Send the same payload to the test API to ensure the issue is not related to the API environment.
- C. Analyze the behavior of subsequent calls to the Production API to ensure there is no global issue, and ask the customer to analyze the API logs to understand the nature of the issue.
- D. Send a test case to the Production API to ensure the service is still up and running.
- E. Obtain the JSON sent to the API and validate that there is no difference between the expected JSON format and the sent one.

Answer: B,C,E

Explanation:

Comprehensive and Detailed In-Depth Explanation:As an Appian Lead Developer in a Post-Production Maintenance phase, troubleshooting a failed integration (HTTP 500 Internal Server Error) requires a systematic approach to isolate the root cause-whether it's Appian-side, API-side, or environmental. A 500 error typically indicates an issue on the server (API) side, but the developer must confirm Appian's contribution and collaborate with the customer. The goal is to select three steps that efficiently diagnose the specific scenario while adhering to Appian's best practices. Let's evaluate each option:

* A. Send the same payload to the test API to ensure the issue is not related to the API environment:This is a critical step.

Replicating the failure by sending the exact payload (from the failed Production call) to a test API environment helps determine if the issue is environment-specific (e.g., Production-only configuration) or inherent to the payload/API logic. Appian's Integration troubleshooting guidelines recommend testing in a non-Production environment first to isolate variables. If the test API succeeds, the Production environment or API state is implicated; if it fails, the payload or API logic is suspect.

This step leverages Appian's Integration object logging (e.g., request/response capture) and is a standard diagnostic practice.

* B. Send a test case to the Production API to ensure the service is still up and running:While verifying Production API availability is useful, sending an arbitrary test case risks further Production disruption during maintenance and may not replicate the specific scenario. A generic test might succeed (e.g., with simpler data), masking the issue tied to the complex JSON. Appian's Post-Production guidelines discourage unnecessary Production interactions unless replicating the exact failure is controlled and justified.

This step is less precise than analyzing existing behavior (C) and is not among the top three priorities.

* C. Analyze the behavior of subsequent calls to the Production API to ensure there is no global issue, and ask the customer to analyze the API logs to understand the nature of the issue:This is essential.

Reviewing subsequent Production calls (via Appian's Integration logs or monitoring tools) checks if the 500 error is isolated or systemic (e.g., API outage). Since Appian can't access API server logs, collaborating with the customer to review their logs is critical for a 500 error, which often stems from server-side exceptions (e.g., unhandled data). Appian Lead Developer training emphasizes partnership with API owners and using Appian's Process History or Application Monitoring to correlate failures- making this a key troubleshooting step.

* D. Obtain the JSON sent to the API and validate that there is no difference between the expected JSON format and the sent one:This is a foundational step. The complex JSON payload is central to the integration, and a 500 error could result from malformed data (e.g., missing fields, invalid types) that the API can't process. In Appian, you can retrieve the sent JSON from the Integration object's execution logs (if enabled) or Process Instance details. Comparing it against the API's documented schema (e.g., via Postman or API specs) ensures Appian's output aligns with expectations. Appian's documentation stresses validating payloads as a first-line check for integration failures, especially in specific scenarios.

* E. Ensure there were no network issues when the integration was sent:While network issues (e.g., timeouts, DNS failures) can cause integration errors, a 500 Internal Server Error indicates the request reached the API and triggered a server-side failure-not a network issue (which typically yields 503 or timeout errors). Appian's Connected System logs can confirm HTTP status codes, and network checks (e.g., via IT teams) are secondary unless connectivity is suspected. This step is less relevant to the 500 error and lower priority than A, C, and D.

Conclusion: The three best steps are A (test API with same payload), C (analyze subsequent calls and customer logs), and D (validate JSON payload). These steps systematically isolate the issue-testing Appian's output (D), ruling out environment-specific problems (A), and leveraging customer insights into the API failure (C). This aligns with Appian's Post-Production Maintenance strategies: replicate safely, analyze logs, and validate data.

References:

- * Appian Documentation: "Troubleshooting Integrations" (Integration Object Logging and Debugging).
- * Appian Lead Developer Certification: Integration Module (Post-Production Troubleshooting).
- * Appian Best Practices: "Handling REST API Errors in Appian" (500 Error Diagnostics).

NEW QUESTION # 12

You have an active development team (Team A) building enhancements for an application (App X) and are currently using the TEST environment for User Acceptance Testing (UAT).

A separate operations team (Team B) discovers a critical error in the Production instance of App X that they must remediate. However, Team B does not have a hotfix stream for which to accomplish this. The available environments are DEV, TEST, and PROD.

Which risk mitigation effort should both teams employ to ensure Team A's capital project is only minorly interrupted, and Team B's critical fix can be completed and deployed quickly to end users?

- A. Team B must communicate to Team A which component will be addressed in the hotfix to avoid overlap of changes. If overlap exists, the component must be versioned to its PROD state before being remediated and deployed, and then versioned back to its latest development state. If overlap does not exist, the component may be remediated and deployed without any version changes.
- B. Team A must analyze their current codebase in DEV to merge the hotfix changes into their latest enhancements. Team B is then required to wait for the hotfix to follow regular deployment protocols from DEV to the PROD environment.
- C. Team B must address the changes directly in PROD. As there is no hotfix stream, and DEV and TEST are being utilized for active development, it is best to avoid a conflict of components. Once Team A has completed their enhancements work, Team B can update DEV and TEST accordingly.
- D. Team B must address changes in the TEST environment. These changes can then be tested and deployed directly to PROD. Once the deployment is complete, Team B can then communicate their changes to Team A to ensure they are incorporated as part of the next release.

Answer: A

Explanation:

Comprehensive and Detailed In-Depth Explanation: As an Appian Lead Developer, managing concurrent development and operations (hotfix) activities across limited environments (DEV, TEST, PROD) requires minimizing disruption to Team A's enhancements while ensuring Team B's critical fix reaches PROD quickly. The scenario highlights no hotfix stream, active UAT in TEST, and a critical PROD issue, necessitating a strategic approach. Let's evaluate each option:

* A. Team B must communicate to Team A which component will be addressed in the hotfix to avoid overlap of changes. If overlap exists, the component must be versioned to its PROD state before being remediated and deployed, and then versioned back to its latest development state. If overlap does not exist, the component may be remediated and deployed without any version changes: This is the best approach. It ensures collaboration between teams to prevent conflicts, leveraging Appian's version control (e.g., object versioning in Appian Designer). Team B identifies the critical component, checks for overlap with Team A's work, and uses versioning to isolate changes. If no overlap exists, the hotfix deploys directly; if overlap occurs, versioning preserves Team A's work, allowing the hotfix to deploy and then reverting the component for Team A's continuation. This minimizes interruption to Team A's UAT, enables rapid PROD deployment, and aligns with Appian's change management best practices.

* B. Team A must analyze their current codebase in DEV to merge the hotfix changes into their latest enhancements. Team B is then required to wait for the hotfix to follow regular deployment protocols from DEV to the PROD environment: This delays Team B's critical fix, as regular deployment (DEV → TEST → PROD) could take weeks, violating the need for "quick deployment to end users." It also risks introducing Team A's untested enhancements into the hotfix, potentially destabilizing PROD. Appian's documentation discourages mixing development and hotfix workflows, favoring isolated changes for urgent fixes, making this inefficient and risky.

* C. Team B must address changes in the TEST environment. These changes can then be tested and deployed directly to PROD. Once the deployment is complete, Team B can then communicate their changes to Team A to ensure they are incorporated as part of the next release: Using TEST for hotfix development disrupts Team A's UAT, as TEST is already in use for their enhancements. Direct deployment from TEST to PROD skips DEV validation, increasing risk, and doesn't address overlap with Team A's work. Appian's deployment guidelines emphasize separate streams (e.g., hotfix streams) to avoid such conflicts, making this disruptive and unsafe.

* D. Team B must address the changes directly in PROD. As there is no hotfix stream, and DEV and TEST are being utilized for active development, it is best to avoid a conflict of components. Once Team A has completed their enhancements work, Team B can update DEV and TEST accordingly: Making changes directly in PROD is highly discouraged in Appian due to lack of testing, version control, and rollback capabilities, risking further instability. This violates Appian's Production governance and security policies, and delays Team B's updates until Team A finishes, contradicting the need for a "quick deployment." Appian's best practices mandate using lower environments for changes, ruling this out.

Conclusion: Team B communicating with Team A, versioning components if needed, and deploying the hotfix (A) is the risk

mitigation effort. It ensures minimal interruption to Team A's work, rapid PROD deployment for Team B's fix, and leverages Appian's versioning for safe, controlled changes-aligning with Lead Developer standards for multi-team coordination.

References:

- * Appian Documentation: "Managing Production Hotfixes" (Versioning and Change Management).
- * Appian Lead Developer Certification: Application Management Module (Hotfix Strategies).
- * Appian Best Practices: "Concurrent Development and Operations" (Minimizing Risk in Limited Environments).

NEW QUESTION # 13

You are taking your package from the source environment and importing it into the target environment.

Review the errors encountered during inspection:

What is the first action you should take to Investigate the issue?

- **A. Check whether the object (UUID ending in 7t00000i4e7a) is included in this package**
- B. Check whether the object (UUID ending in 25606) is included in this package
- C. Check whether the object (UUID ending in 18028821) is included in this package
- D. Check whether the object (UUID ending in 18028931) is included in this package

Answer: A

Explanation:

The error log provided indicates issues during the package import into the target environment, with multiple objects failing to import due to missing precedents. The key error messages highlight specific UUIDs associated with objects that cannot be resolved. The first error listed states:

* "TEST_ENTITY_PROFILE_MERGE_HISTORY": The content [id=uuid-a-0000m5fc-f0e6-8000-9b01-011c48011c48, 18028821] was not imported because a required precedent is missing: entity [uuid=a-0000m5fc-f0e6-8000-9b01-011c48011c48, 18028821] cannot be found..." According to Appian's Package Deployment Best Practices, when importing a package, the first step in troubleshooting is to identify the root cause of the failure. The initial error in the log points to an entity object with a UUID ending in 18028821, which failed to import due to a missing precedent. This suggests that the object itself or one of its dependencies (e.g., a data store or related entity) is either missing from the package or not present in the target environment.

* Option A (Check whether the object (UUID ending in 18028821) is included in this package): This is the correct first action. Since the first error references this UUID, verifying its inclusion in the package is the logical starting point. If it's missing, the package export from the source environment was incomplete. If it's included but still fails, the precedent issue (e.g., a missing data store) needs further investigation.

* Option B (Check whether the object (UUID ending in 7t00000i4e7a) is included in this package):

This appears to be a typo or corrupted UUID (likely intended as something like "7t000014e7a" or similar), and it's not referenced in the primary error. It's mentioned later in the log but is not the first issue to address.

* Option C (Check whether the object (UUID ending in 25606) is included in this package): This UUID is associated with a data store error later in the log, but it's not the first reported issue.

* Option D (Check whether the object (UUID ending in 18028931) is included in this package): This UUID is mentioned in a subsequent error related to a process model or expression rule, but it's not the initial failure point.

Appian recommends addressing errors in the order they appear in the log to systematically resolve dependencies. Thus, starting with the object ending in 18028821 is the priority.

References: Appian Documentation - Package Deployment and Troubleshooting, Appian Lead Developer Training - Error Handling and Import/Export.

NEW QUESTION # 14

Your team has deployed an application to Production with an underperforming view. Unexpectedly, the production data is ten times that of what was tested, and you must remediate the issue. What is the best option you can take to mitigate their performance concerns?

- A. Introduce a data management policy to reduce the volume of data.
- B. Create a table which is loaded every hour with the latest data.
- C. Bypass Appian's query rule by calling the database directly with a SQL statement.
- **D. Create a materialized view or table.**

Answer: D

Explanation:

Comprehensive and Detailed In-Depth Explanation:

As an Appian Lead Developer, addressing performance issues in production requires balancing Appian's best practices, scalability, and maintainability. The scenario involves an underperforming view due to a significant increase in data volume (ten times the tested amount), necessitating a solution that optimizes performance while adhering to Appian's architecture. Let's evaluate each option:

A . Bypass Appian's query rule by calling the database directly with a SQL statement:

This approach involves circumventing Appian's query rules (e.g., `a!queryEntity`) and directly executing SQL against the database.

While this might offer a quick performance boost by avoiding Appian's abstraction layer, it violates Appian's core design principles.

Appian Lead Developer documentation explicitly discourages direct database calls, as they bypass security (e.g., Appian's row-level security), auditing, and portability features. This introduces maintenance risks, dependencies on database-specific logic, and potential production instability-making it an unsustainable and non-recommended solution.

B . Create a table which is loaded every hour with the latest data:

This suggests implementing a staging table updated hourly (e.g., via an Appian process model or ETL process). While this could reduce query load by pre-aggregating data, it introduces latency (data is only fresh hourly), which may not meet real-time requirements typical in Appian applications (e.g., a customer-facing view). Additionally, maintaining an hourly refresh process adds complexity and overhead (e.g., scheduling, monitoring). Appian's documentation favors more efficient, real-time solutions over periodic refreshes unless explicitly required, making this less optimal for immediate performance remediation.

C . Create a materialized view or table:

This is the best choice. A materialized view (or table, depending on the database) pre-computes and stores query results, significantly improving retrieval performance for large datasets. In Appian, you can integrate a materialized view with a Data Store Entity, allowing `a!queryEntity` to fetch data efficiently without changing application logic. Appian Lead Developer training emphasizes leveraging database optimizations like materialized views to handle large data volumes, as they reduce query execution time while keeping data consistent with the source (via periodic or triggered refreshes, depending on the database). This aligns with Appian's performance optimization guidelines and addresses the tenfold data increase effectively.

D . Introduce a data management policy to reduce the volume of data:

This involves archiving or purging data to shrink the dataset (e.g., moving old records to an archive table). While a long-term data management policy is a good practice (and supported by Appian's Data Fabric principles), it doesn't immediately remediate the performance issue. Reducing data volume requires business approval, policy design, and implementation-delaying resolution. Appian documentation recommends combining such strategies with technical fixes (like C), but as a standalone solution, it's insufficient for urgent production concerns.

Conclusion: Creating a materialized view or table (C) is the best option. It directly mitigates performance by optimizing data retrieval, integrates seamlessly with Appian's Data Store, and scales for large datasets-all while adhering to Appian's recommended practices. The view can be refreshed as needed (e.g., via database triggers or schedules), balancing performance and data freshness. This approach requires collaboration with a DBA to implement but ensures a robust, Appian-supported solution.

Reference:

Appian Documentation: "Performance Best Practices" (Optimizing Data Queries with Materialized Views).

Appian Lead Developer Certification: Application Performance Module (Database Optimization Techniques).

Appian Best Practices: "Working with Large Data Volumes in Appian" (Data Store and Query Performance).

NEW QUESTION # 15

Your Appian project just went live with the following environment setup: DEV > TEST (SIT/UAT) > PROD. Your client is considering adding a support team to manage production defects and minor enhancements, while the original development team focuses on Phase 2. Your client is asking you for a new environment strategy that will have the least impact on Phase 2 development work. Which option involves the lowest additional server cost and the least code retrofit effort?

- A. Phase 2 development work stream: DEV > TEST (SIT) > STAGE (UAT) > PROD Production support work stream: DEV > TEST2 (SIT/UAT) > PROD
- **B. Phase 2 development work stream: DEV > TEST (SIT/UAT) > PROD
Production support work stream: DEV > TEST2 (SIT/UAT) > PROD**
- C. Phase 2 development work stream: DEV > TEST (SIT/UAT) > PROD Production support work stream: DEV2 > TEST (SIT/UAT) > PROD
- D. Phase 2 development work stream: DEV > TEST (SIT) > STAGE (UAT) > PROD Production support work stream: DEV2 > STAGE (SIT/UAT) > PROD

Answer: B

Explanation:

Comprehensive and Detailed In-Depth Explanation:

The goal is to design an environment strategy that minimizes additional server costs and code retrofit effort while allowing the support team to manage production defects and minor enhancements without disrupting the Phase 2 development team. The current setup (DEV > TEST (SIT/UAT) > PROD) uses a single development and testing pipeline, and the client wants to segregate support

activities from Phase 2 development. Appian's Environment Management Best Practices emphasize scalability, cost efficiency, and minimal refactoring when adjusting environments.

Option C (Phase 2 development work stream: DEV > TEST (SIT/UAT) > PROD; Production support work stream: DEV > TEST2 (SIT/UAT) > PROD):

This option is the most cost-effective and requires the least code retrofit effort. It leverages the existing DEV environment for both teams but introduces a separate TEST2 environment for the support team's SIT/UAT activities. Since DEV is already shared, no new development server is needed, minimizing server costs. The existing code in DEV and TEST can be reused for TEST2 by exporting and importing packages, with minimal adjustments (e.g., updating environment-specific configurations). The Phase 2 team continues using the original TEST environment, avoiding disruption. Appian supports multiple test environments branching from a single DEV, and the PROD environment remains shared, aligning with the client's goal of low impact on Phase 2. The support team can handle defects and enhancements in TEST2 without interfering with development workflows.

Option A (Phase 2 development work stream: DEV > TEST (SIT) > STAGE (UAT) > PROD; Production support work stream: DEV > TEST2 (SIT/UAT) > PROD):

This introduces a STAGE environment for UAT in the Phase 2 stream, adding complexity and potentially requiring code updates to accommodate the new environment (e.g., adjusting deployment scripts). It also requires a new TEST2 server, increasing costs compared to Option C, where TEST2 reuses existing infrastructure.

Option B (Phase 2 development work stream: DEV > TEST (SIT) > STAGE (UAT) > PROD; Production support work stream: DEV2 > STAGE (SIT/UAT) > PROD):

This option adds both a DEV2 server for the support team and a STAGE environment, significantly increasing server costs. It also requires refactoring code to support two development environments (DEV and DEV2), including duplicating or synchronizing objects, which is more effort than reusing a single DEV.

Option D (Phase 2 development work stream: DEV > TEST (SIT/UAT) > PROD; Production support work stream: DEV2 > TEST (SIT/UAT) > PROD):

This introduces a DEV2 server for the support team, adding server costs. Sharing the TEST environment between teams could lead to conflicts (e.g., overwriting test data), potentially disrupting Phase 2 development. Code retrofit effort is higher due to managing two DEV environments and ensuring TEST compatibility.

Cost and Retrofit Analysis:

Server Cost: Option C avoids new DEV or STAGE servers, using only an additional TEST2, which can often be provisioned on existing hardware or cloud resources with minimal cost. Options A, B, and D require additional servers (TEST2, DEV2, or STAGE), increasing expenses.

Code Retrofit: Option C minimizes changes by reusing DEV and PROD, with TEST2 as a simple extension. Options A and B require updates for STAGE, and B and D involve managing multiple DEV environments, necessitating more significant refactoring. Appian's recommendation for environment strategies in such scenarios is to maximize reuse of existing infrastructure and avoid unnecessary environment proliferation, making Option C the optimal choice.

NEW QUESTION # 16

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