Sample Exam
ISTQB® Expert Level
Test Automation - Engineering
2014

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International Software Testing Qualifications Board

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Expert Level Test Automation - Engineering

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0. Introduction

0.1 Purpose of this document

This document contains a full sample exam following the rules described in the ISTQB Expert Level Exam Structure and Rules document.

The sample questions, answer sets and associated justifications in this document have been created by a team of subject matter experts and experienced question writers with the aim of assisting ISTQB® Member Boards and Exam Boards in their question writing activities as well as people planning to take the ISTQB Expert Level Test Automation – Engineering examination.

These questions cannot be used as-is in any official examination, but they should serve as guidance for question writers. Given the wide variety of formats and subjects, these sample questions should offer many ideas for the individual Member Boards on how to create good questions and appropriate answer sets for their examinations. Furthermore training providers can use these questions as part of their training to prepare participants for the examination.

0.2 Instructions

The question and answer sets are organized in the following way:
- Learning Objective and K-level
- Question - including any scenario followed by the question stem
- Answer Set
- Correct answer – including justification of the answers

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1. Test Automation - Engineering Sample Questions

Question 1 K2

Which of the following is an advantage of test automation?

Answer Set:
A. Some tests will not be automated so manual testers will still be needed
B. Tests can be run more slowly which allows the operator to see individual actions
C. Tests limit the results checking to predictable or verifiable results
D. Tests that are automated can be more complex than manual tests

Question 2 K2

Which one of the following is a success factor in a test automation project?

Answer Set:
A. An automation approach that targets all parts of the SUT for the broadest possible coverage
B. A test automation architecture that is designed for maintainability, performance and learnability
C. A test automation solution that applies test automation in the same way for all old and new parts of the SUT
D. A project that tracks traceability outside the test automation framework

Question 3 K4

You are working on a project that has use cases to describe the requirements. You have analyzed the project and have determined that you will use scenario-based test generation and will use risk assessments to determine the priority of implementation of the automation for the various use cases. You have selected scenario-based notation for the test definition. You have also worked with the infrastructure and development teams and have determined which monitoring and analysis tools will be used during execution. What do you need to do now?

Answer Set:
A. You need to change the test generation approach. You should not be using scenario-based test generation. You need to focus on transition/state/path coverage when generating the test cases.
B. Since your application is data-based, you now need to specify a data-driven method that you will use to define the tests.
C. You need to select the test execution tool and make sure it will work with the test generation approach you have selected.
D. You need to make a full estimate for the automation effort, including manpower allocation, resource usage, training requirements, and cost/benefit analysis.

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Question 4 K4

You are ready to deploy your test automation solution to the organization. This organization has had several other test automation solution attempts that have not gone well. You have reviewed the comments and complaints from previous deployments and have discovered that the users of the test automation solution had not been trained and had no way to get knowledgeable help. In most cases they became frustrated and were unable to implement the test automation on schedule. Your management has told you this is the last time the organization will attempt to launch a test automation solution. Which of the following steps should you take to be sure the new test automation solution does not fail (pick 2)?

Answer Set:
  A. Rollout the test automation solution and training to all projects as part of a single deployment across the organization to ensure equal adoption and to provide the maximum usage information
  B. Procure adequate licenses in advance for the total number of anticipated users so as not to delay expansion of the test automation solution usage
  C. Define and publish the usage guidelines for the test automation solution to ensure consistent usage
  D. Select a project that the organization considers small and unimportant so that any delays will not result in schedule or budget issues
  E. Implement an automated information gathering process that will capture usage metrics

Question 5 K3

Your manager has told you that he wants autonomous execution for the test automation software you are architecting. You know that the previous automation implementation was unusable due to its inability to handle unexpected error conditions. What should you do to ensure your implementation will handle these?

Answer Set:
  A. Test the software manually first to ensure there are no unexpected errors
  B. Write code that will bypass all unexpected pop-up dialogs by closing them and continuing with the execution
  C. Ensure that all necessary data is available in the database prior to execution
  D. Develop specific recovery scripts that will deal with unexpected issues and return the test environment to a known state

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Question 6 K4

You have been called in to consult on a project that is considering test automation. You have reviewed the situation and have made a number of observations.
1. The software to be automated is part of a regression suite that is run at least twice a quarter and is expected to be needed for at least the next three years.
2. The tests are quite complex and prone to tester error during execution.
3. There is a widely used open source tool that is compatible with the development platform. No affordable commercial tools support the platform.
4. The team has just changed from an Agile development process to a V-Model. They are working through process issues and the level of detail required for new test case development.
5. There is no UI in the product. It works through APIs only.
6. The environment for the automation will be the development environment which experiences frequent updates to the database management software.
7. The test data is refreshed from production quarterly.
8. The team is excited about the prospects of automation and has taken several training courses to be ready for the changes.

Given this information, which of the following is likely to be an obstacle to the automation effort?

Answer Set:
   A. The test environment may be unstable and the updates may cause the automation to fail.
   B. The tests are complex and will be difficult to automate given that the manual execution is error-prone.
   C. No commercial tools are available for this implementation on this platform.
   D. There is no UI to use for the automation and API automation is not cost effective.

Question 7 K3

Your organization has set up a new environment for the automated tests. This environment has been well documented, including the configuration, steps for installation, setup and teardown. You have reviewed this documentation and the system configuration and have found it all to be accurate and correct. Which of the following is a logical next step to further validate the environment?

Answer Set:
   A. Run the automation tests to make sure the appropriate tests pass and fail
   B. Upgrade the test tools to the latest versions, including service packs
   C. Verify that a high level of intrusion is being achieved by the test tools
   D. Check that new tests focus on new features of the framework

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Question 8 K3

Your organization has a new automated test suite that needs to be verified for consistency and correct behavior. At this point, you have verified that the suite is up and running, the environment is correctly configured and supports the suite. What should you do to verify that the suite is working correctly in the environment?

Answer Set:
   A. Conduct a pre-test connectivity check of the internal and external interfaces
   B. Upgrade the test tools to the latest versions, including service packs
   C. Teardown the test automation solution and rebuild it to verify that it works consistently before and after the rebuild
   D. Check that the tests give repeatable and reliable results

Question 9 K2

In which layer of the generic test automation architecture should you find the tool support for defining test data?

Answer Set:
   A. The test procedure layer
   B. The test definition layer
   C. The test generation layer
   D. The test adaptation layer

Question 10 K2

Why are regression tests good candidates for test automation?

Answer Set:
   A. Because they find the most defects
   B. Because they are usually complex to run and executing them manually is error-prone
   C. Because they are executed frequently in the life of the SUT
   D. Because they are easily implemented with keyword-driven approaches

Question 11 K2

If you are using a keyword-driven approach to test automation, which of the following should be considered first when automating the testing of new features?

Answer Set:
  A. The behavior of the software may have changed, so the behavior models may have to be changed accordingly
  B. New keywords should be developed for any new or changed functionality
  C. The defects found in the previous version of the SUT should be used to guide the creation of new keywords for testing
  D. The existing keywords should be evaluated to see if they can be expanded or changed to test the new features

Question 12 K4

You have been working on a stable product for several years now. Your test automation is working well and has required little maintenance. You have just been told that the infrastructure team is planning a change from SQL Server to Oracle and they will be installing a new SAN as well. The developers have told you that they expect to make only "minor" changes to the SQL and don't expect any issues. Part of your automation is a routine that checks if the necessary test data is in the database. If it's there, the data is retrieved to a spreadsheet where it is accessed by the automation code. If the data is not there, your automation code creates it and records it in the spreadsheet.

How should you plan for testing your test automation solution in order to find and fix any issues with the test automation?

Answer Set:
  A. You should make all the changes to your code that you expect to need and run the full set of tests to see if they work. This will be the most efficient way to verify that the test automation solution works with the new system.
  B. Since the developers say they expect no issues, you need to test only your data verification/creation code. When you are sure that works, you should be fine to run the entire suite. The SAN implementation should be tested by the infrastructure team, so there is no need to run automated tests to verify its impact on the system.
  C. You need to test your database calls and verify that the new SAN does not cause any timing issues with the rest of your code. The developers will test their changes.
  D. You need to approach this incrementally, testing each set of your scripts individual (data creation, data verification, data retrieval). Once that's done, you need to run a regression test concentrating on the parts of the code with database access. A separate performance test should be conducted to determine if the SAN causes any issues.

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Question 13 K4

You have just been assigned to a new test automation project. The developers have written some of their own automated tests and they have added test hooks to the software to create a test interface. You have investigated the software and have determined that the test interfaces provide adequate access to thoroughly test the software. You are also experienced with several test automation tools that should work in this environment as well and will use the open interfaces rather than the custom built test interfaces in the software. The test automation tools would require a substantial license cost and your team would need some training to effectively use the tools. If you continue to use the test hooks, you could leverage the code that has already been written by the developers and expand the coverage from there. What is the most likely disadvantage of using the test hooks for the primary test automation effort?

Answer Set:
    A. There may be a high level of intrusion that could cause a risk of false alarms during the testing
    B. There will be a significant development effort to leverage the existing test hooks with automated test code
    C. A risk-based approach cannot be used when the test hooks are employed because you will have to use the hooks that already exist
    D. The test automation tool you want to use may not work with the test hooks and you would not be able to leverage that existing code

Question 14 K2

According to the syllabus, what is the most practical way to publish a test automation execution report?

Answer Set:
    A. Post it to a web site
    B. Send it out to a mailing list that includes the development team, the test team and the project manager
    C. Provide a subscription facility and let people sign up to receive it by email
    D. Print it out and post it on a wall in a heavily used hallway

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Question 15 K4

Your team has recently completed a test automation solution and has deployed it into the test environment. During testing of the automation code, there have been numerous problems with the test execution terminating, but it has been hard to determine where it is failing and why. There is a suspicion that the failure somehow may be related to the randomly generated data that is being used, but it could be due to other issues. It has been noted that the tests are not always failing at the same point in the code or on the same iteration. Sometimes they will run for hours and then fail and sometimes they fail almost immediately.

You have been tasked with designing the logging for the test automation architecture, including the applicable SUT data. Given this scenario, which of the following should you be sure to include in your logged information to help diagnose this problem? Pick 2.

Answer Set:
   A. Number of times each test case has been executed
   B. List of all actions performed by each test case to allow play back of the actions with the same timing
   C. Any available crash dumps and stack traces
   D. Data used by each test case for each iteration
   E. Screen shots taken at the point the test case fails

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Answer 2 of the following 3 essay questions.

Essay 1

Your organization develops software for an online auction site. This site normally handles 10,000 transactions in a day (both buyer and seller transactions) and has a peak load of 100,000 concurrent users. You have a good test automation solution that has been in use for several years and you have been able to find and resolve a number of issues that would have been impossible to detect with manual testing (but would have been very obvious in production). The solution has used a data-driven approach and results verification is done within the individual scripts in a variety of ways.

Unfortunately, previous budget restrictions have resulted in the automation falling behind the implementation of new features. In particular you have had to limit the number of interfaces that are tested even though new interfaces have been exposed by the developers for third party integration. There has been a problem with the credit card handling automation and you have had to disable support for AMEX cards. There have also been several regulatory changes that affected credit card handling and your automation does not yet support those changes.

Your organization is planning a major re-organization. As part of the re-organization, half of the experienced automation team will be moving to another project and they will be replaced by testers with programming capabilities who have only done manual testing on the product up to this point. The replacement testers have taken a number of automation classes, but have limited real automation experience. This is a particular concern for you because the experienced test automation engineers were able to work around some of the "less than friendly" interfaces in the automation tool, particularly in the area of reporting.

In addition to this personnel change, you have also been given a large budget to improve the maintainability of the existing test automation solution and have been asked to create a strategy for other general improvements to the test automation architecture.

1. Identify two areas for improvement of the existing test automation solution that should be included in your improvement strategy.
2. Given your new group of test automation engineers, how should you train them regarding the automated software (and the automation plan in general) and what roles and responsibilities should be assigned to them?
3. Explain how preventive, corrective, perfective and adaptive maintenance should be conducted on the test automation solution.

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Essay 2

You are working on a project that will employ the generic test automation architecture to create the test automation architecture. The generic test automation architecture uses a data-driven test approach. Your project uses a service-oriented architecture and each of the services must be tested independently, as well as end-to-end, to support your particular application. Communication between the services is handled with XML. In addition to the SOA testing, there is also a need for the test automation software to communicate with an emulator that will represent multiple printers that the application supports. Each of the supported printers has different configuration parameters and produces different errors, but the hardware is not available for testing at this time. Your automation software will communicate with the emulator to determine the proper handling of print requests and printer errors.

1. What parts of the generic test automation architecture would you need to customize to create the test automation architecture for this project? What type of customization would be needed?
2. When you are building the test automation solution, explain two areas where compatibility with the SUT will be important and why it will be important for this project.
3. Identify two technical risks with this project and explain the mitigation strategies that could be used to address these risks.

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Essay 3

You have recently started in a new organization as the lead engineer for test automation. During your interview there were several references made to problems with the current automation tool, AutoMateTest. You have now learned that it is your job to either select a new tool or make the current tool work as needed. You have conducted an analysis of the tool issues and have identified the following problems:

1. AutoMateTest has no interface with the test management tool that is used by the manual testers. Management wants to see unified reporting for the automated and manual tests.
2. There are a number of objects in the GUI that are not recognized by the tool. This is inhibiting automation in several key areas of the application.
3. The tool is very complicated to use and the test automation engineers frequently refer to the help text to figure out what to do.
4. After tests have been run, the SUT acts "differently". Only after the system is rebooted does it return to its normal state. In particular, the system seems to be slow and the application has a tendency to crash.
5. Your management was told by the tool vendor that record/playback was the fastest way to implement automation and that "everyone can be a test automation engineer". Your manager has set a goal of 100% automation by the end of next month.

You have also discovered that management has no idea what has been automated, how effective the automation has been in helping with the overall testing, what type of effort has been spent and how much more effort will be needed to meet the automation goals. Also, they have no idea what realistic automation goals would be for the SUT.

1. For each of the identified problems, explain how you can either work around the problem with the existing tool or, if you can't work around the problem, explain how you will be sure a new tool won't have the same issues.
2. Define six automation metrics you should be tracking and explain how you will track this information. These metrics will be used to educate your management regarding the value of the existing automation and to help them understand the workload ahead as you work toward the automation goals. Also explain what would be reasonable automation goals for the next year.