Sample Exam – Answers

Sample Exam set A
Version 1.0

ISTQB® Test Management Syllabus Advanced Level

Compatible with Syllabus version 3.0

International Software Testing Qualifications Board

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Document Responsibility

The ISTQB® Examination Working Group is responsible for this document.

This document is maintained by a core team from ISTQB® consisting of the Syllabus Working Group and Exam Working Group.

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Revision History

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1.0	October 31, 2023	Approval for BETA REVIEW
1.0	December 14, 2023	Rework after BETA REVIEW
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1.0	February 29, 2024	Rework after Proofreading and Feedback from trial exams
1.0	May 03, 2024	Rework after release; only typos and inconsistencies eliminated

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Introduction

Purpose of this document

The example questions and answers and associated justifications in this sample exam 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
- Providing training providers and exam candidates with examples of exam questions

These questions cannot be used as-is in any official examination.

Note that real exams may include a wide variety of questions, and this sample exam ***is not*** intended to include examples of all possible question types, styles or lengths, also this sample exam may both be more difficult or less difficult than any official exam.

Instructions

In this document you may find:

- Answer Key table, including for each correct answer:
  - K-level, Learning Objective, and Point value
- Answer sets, including for all questions:
  - Correct answer
  - Justification for each response (answer) option
  - K-level, Learning Objective, and Point value
- Additional answer sets, including for all questions [does not apply to all sample exams]:
  - Correct answer
  - Justification for each response (answer) option
  - K-level, Learning Objective, and Point value

- *Questions are contained in a separate document*
- The main part covers a full Sample exam paper acc. to CTAL-TM v3.0 Structure and Rules. The Appendix covers additional questions, which are not mandatory in a complete CTAL-TM v3.0 sample exam set. The main part and the appendix of this document covers at least one question for each LO. Some questions in the appendix are marked with e.g. #A10a and #A10b, that means that we provided 2 sample exam items for one Learning objective.

Answer Key

Question Number (#)	Correct Answer	LO	K-Level	Points
1	a	TM-1.1.1	K2	1
2	a	TM-1.1.2	K2	1
3	c	TM-1.2.1	K2	1
4	a	TM-1.2.2	K2	1
5	a	TM-1.2.3	K2	1
6	c	TM-1.2.4	K2	1
7	d	TM-1.2.7	K4	3
8	d	TM-1.2.7	K4	3
9	a	TM-1.3.1	K2	1
10	c	TM-1.3.2	K2	1
11	a	TM-1.3.4	K4	3
12	a	TM-1.3.4	K4	3
13	b	TM-1.3.5	K2	1
14	c	TM-1.4.1	K2	1
15	a	TM-1.4.2	K4	3
16	a	TM-1.4.2	K4	3
17	b	TM-1.4.3	K3	2
18	a	TM-1.4.3	K3	2
19	a	TM-1.5.1	K2	1
20	c	TM-1.5.2	K2	1
21	a, e	TM-1.5.4	K3	2
22	d	TM-1.5.4	K3	2
23	a	TM-1.6.1	K2	1
24	c	TM-1.6.3	K4	3
25	c	TM-1.6.3	K4	3

Question Number (#)	Correct Answer	LO	K-Level	Points
26	b	TM-1.6.4	K2	1
27	c	TM-2.1.1	K2	1
28	a	TM-2.1.2	K2	1
29	d	TM-2.1.3	K4	3
30	a	TM-2.1.3	K4	3
31	d	TM-2.2.2	K2	1
32	a, b	TM-2.2.3	K4	3
33	a	TM-2.2.3	K4	3
34	b	TM-2.3.1	K3	2
35	b	TM-2.3.1	K3	2
36	c	TM-2.3.2	K2	1
37	b	TM-2.3.3	K2	1
38	c	TM-2.3.4	K2	1
39	b	TM-2.3.5	K3	2
40	b, c	TM-2.3.5	K3	2
41	b	TM-2.3.6	K2	1
42	d	TM-3.1.1	K2	1
43	a	TM-3.1.2	K4	3
44	a	TM-3.1.2	K4	3
45	c	TM-3.1.3	K2	1
46	d	TM-3.1.4	K2	1
47	d	TM-3.1.5	K2	1
48	b	TM-3.2.1	K2	1
49	b	TM-3.2.2	K3	2
50	a	TM-3.2.2	K3	2

Answers

Question Number (#)	Correct Answer	Explanation / Rationale	Learning Objective (LO)	K-Level	Number of Points
Section: Test Process					
1	a	a) Is correct. Per syllabus section 1.1.1, all aspects of the test plan need to be accepted by all stakeholders. Therefore, reaching consensus among all stakeholders is the most essential activity in developing and establishing a test plan. b) Is not correct. The test plan relates to the test objectives, but it is NOT the most essential activity in developing and establishing a test plan. c) Is not correct. Identify and estimate is a test planning activity, but it is NOT the most essential activity in developing and establishing a test plan. d) Is not correct. Risk mitigation relates to the overall project and is not unique for the individual stakeholders.	TM-1.1.1	K2	1
2	a	a) Is correct. Per syllabus section 1.1.2, test monitoring involves the ongoing checking of all test activities, the comparison of all test activities, and the comparison of actual test progress against the test plan. b) Is not correct. Test results are only part of the test activities to be monitored. c) Is not correct. If the risks are unknown they can´t be compared to changes. d) Is not correct. Acceptance criteria can be compared against exit criteria, but this is only part of what should be monitored.	TM-1.1.2	K2	1

Section: Context of Testing					
3	c	a) Is not correct. Automation testers would not be involved in initial discussions, Development Leads are stakeholders and Finance Staff are customer stakeholders. b) Is not correct. Security architects would be involved in initial discussions, but the ops team is not necessarily involved early in initial discussions. c) Is correct. These are all stakeholders according to the syllabus. These are all high-level stakeholders who have direct influence on the project and its outcomes. They need to be involved in detailed discussions to ensure that their expectations, requirements, and constraints are understood and addressed by the test manager. d) Is not correct. Project managers for other projects and the test management tool vendor are not involved in any discussions for this project, however the trainer is a stakeholder and can provide input into early planning discussions.	TM-1.2.1	K2	1
4	a	a) Is correct. They are the primary users of the test management tool and the ones who perform the acceptance testing tasks. They have a high interest in the functionality, usability, and reliability of the tool. They also have a high influence on the acceptance testing outcomes and quality (high influence, high interest). b) Is not correct. With a Commercial product, developers are low influence stakeholders (apathetic). c) Is not correct. With a Commercial product, managers are low influence, high interest stakeholders (defenders). d) Is not correct. With a Commercial product, Project Manager are high influence, low interest stakeholders (latent).	TM-1.2.2	K2	1

5	a	a) Is correct. Coaching and mentoring the test team on automation, continuous integration, testing and delivery is a crucial test management task in Agile development. It helps the team to adapt to the new practices and deliver high-quality software in shorter time frames. It also enables the team to perform testing at an early stage and reduce the technical debt. b) Is not correct. Giving the team time to learn by negotiating deadlines and recognizing the team's small victories is important to keep their morale up and foster a culture of learning. However, this alone is not enough to ensure the success of the project. The team also needs to acquire the necessary skills and tools to perform testing in Agile. c) Is not correct. Convincing leadership that introducing Agile practices will not work as the team and resources are not ready for it is a negative and defeatist approach. It shows a lack of willingness to change and improve. Agile practices have many benefits for software development such as faster delivery, better quality, and higher customer satisfaction. The test manager should support the transition and help the team to overcome the challenges. d) Is not correct. Hiring some new team members who are familiar with continuous testing is not a feasible or effective solution. It can create conflicts and resentment among the existing team members, who may feel undervalued or replaced. It can also increase the cost and complexity of the project. The test manager should focus on developing the skills and capabilities of the current team instead of hiring new ones.	TM-1.2.3	K2	1

6	c	a) Is not correct. Sequential. Only two of the four observations are specific to Sequential. The description above does not fit this model, as it involves test iterations and automation, which are features of iterative models. b) Is not correct. Two of the four observations are specific to Iterative. The description above does not fit this model, as it requires testing to start only after the requirements are completed, which is a feature of sequential models. c) Is correct. Hybrid. The completion of products and tasks before moving to the next iteration and not beginning to test until requirements are completed are part of the sequential model. The use of iterations and automation are part of iterative models. The syllabus states that that "Hybrid life cycle models are a combination of sequential and iterative models d) Is not correct. DevOps is an Iterative model – only some aspects of iterative models are observed. The description above does not fit this model, as it does not mention any aspects of DevOps, such as continuous integration, delivery, deployment, or monitoring	TM-1.2.4	K2	1

7	d	a) Is not correct. Implement DevOps Development Tools is not applicable, because it is not a test management activity. b) Is not correct. Automated testing dashboards are used in an iterative methodology, not manual. c) Is not correct. Automated regression suite is used in an iterative methodology, not manually run. d) Is correct. Enabling the testing team and facilitating communication is applicable when planning to implement multiple releases every month, following an iterative methodology. This is because test management activities are those that involve planning, monitoring, and controlling the testing process. Some examples of test management activities are: - Defining the test strategy and approach - Estimating the test effort and resources - Scheduling the test activities and milestones - Assigning the test tasks and roles - Tracking the test progress and quality - Reporting the test results and status - Managing the test risks and issues - Coordinating the test stakeholders and dependencies In an iterative methodology, such as Agile or DevOps, test management activities need to be aligned with the frequent and incremental delivery of software features, enhancements, and bug fixes. This means that test management activities need to be: - Adaptive and flexible to changing requirements and priorities - Collaborative and transparent to ensure alignment and feedback among the team and other stakeholders - Automated and integrated to enable fast and reliable testing and deployment	TM-1.2.7	K4	3

		Therefore, enabling the testing team and facilitating communication is an applicable test management activity for this scenario, as it helps to achieve these goals. Enabling the testing team means providing them with the necessary skills, tools, environment, and support to perform their testing tasks effectively and efficiently. Facilitating communication means ensuring that the testing team has clear and timely information about the software features, enhancements and bug fixes, as well as their quality expectations, risks, issues, dependencies, and feedback.			
8	d	a) Is not correct. Developing a risk management plan is important, but not the most emphasized activity in this project. The project is in the maintenance phase, so most of the risks should have been identified and mitigated in the earlier phases. b) Is not correct. Developing a test team configuration plan is also important, but not the most emphasized activity in this project. The test team has been working together for a while, so they should have established effective communication and coordination mechanisms. c) Is not correct. Developing a test automation plan is important, but not the most emphasized activity in this project because it can help achieve continuous testing, which is a key practice in DevOps. Test automation can also reduce manual effort, improve test coverage, and provide faster feedback on product quality. d) Is correct. The reason is that regression testing is essential for ensuring that the defect fixes and feature enhancements do not introduce any new faults or adversely affect the existing functionality of the software. Regression testing is especially important for safety-critical software, as any failure could have severe consequences for the users and the patients. Therefore, developing a regression testing plan that covers the relevant test cases and uses appropriate tools is the most important test management activity for this project.	TM-1.2.7	K4	3

Section: Risk-based testing					
9	a	a) Is correct. To be most effective, risk analysis should include stakeholders, in this case especially of independent experts in cloud architecture. Relying on statements of the vendor is not enough. In the scenario, the test team underestimated the risk likelihood of a system outage due to the migration of a web application to the cloud. They relied on the cloud system provider's estimation, which was not accurate or reliable. This led to insufficient reliability testing, which failed to detect the defects that caused the website to become unavailable for two days. To avoid such problems in the future, the test team should involve additional stakeholders in risk analysis, especially independent experts in cloud architecture. These stakeholders can provide more objective and realistic assessments of the risk likelihood, based on their knowledge and experience. b) Is not correct. In risk-based testing, a moderate risk level only justifies moderate test intensity. c) Is not correct. Involving experienced testers is not enough for obtaining a reliable assessment of the risk level. A broad group of stakeholders is needed, including independent experts in cloud architecture. d) Is not correct. It appears that the test team did follow a risk-based testing strategy. Had the risk been assessed correctly, the test team would have conducted reliability testing and detected the defects.	TM-1.3.1	K2	1
10	c	a) Is not correct. The question does not mention interviewing the stakeholders, only providing them with a prepared spreadsheet. b) Is not correct. A checklist would be a list of items to check, not a spreadsheet with multiple columns to fill in. c) Is correct. You organize a workshop with the stakeholders to jointly identify the failure modes of component integration by filling in the template. d) Is not correct. Brainstorming is a spontaneous technique to share ideas, but in this case a spreadsheet has been prepared which guides the risk identification.	TM-1.3.2	K2	1

11	a	a) Risk A gives us an exposure of 40% * 1,500,000 = 600,000 € which is the highest, hence this should be prioritized during testing. As a prototype makes main features of the application testable to the users early, this method is appropriate to mitigate the risk. B and D are project risks, therefore other (non-) testing activities are needed. b) Risk B is not a product risk – hence cannot be mitigated by testing. c) Risk C gives us an exposure of 90% * 100,000 = 90,000 € which is less than Risk A, hence this is not the priority during testing. Reviewing can mitigate the risk of non-understandable documentation. d) Risk D is not a product risk – hence cannot be mitigated by testing. This means, a) is the correct answer.	TM-1.3.4	K4	3
12	a	a) Is correct. It follows the principles of risk-based testing, which states that the test effort should be proportional to the risk level, and that the most qualified people should test the test items with the highest risk levels. This ensures that the most critical features of the application are tested thoroughly and effectively. It also uses both static testing and dynamic testing, which are complementary and can cover different types of risks. b) Is not correct. It does not use both static testing and dynamic testing for all features, which may result in missing some risks that can only be detected by one or the other. It also does not assign the testers based on their skills and experience, which may affect the quality of testing. c) Is not correct. It skips testing for the features with lower risk levels, which may still have some defects that can affect the quality of the product. It also does not assign the testers based on their skills and experience, which may affect the quality of testing. d) Is not correct. It skips testing for the features with lower risk levels, which may still have some defects that can affect the quality of the product. It also does not use dynamic testing, which is essential for verifying the functionality and performance of the product.	TM-1.3.4	K4	3

13	b	The situation demands a lightweight technique, since the application is non-safety-critical and lead time and effort are limited both for the team and for the stakeholders. a) Is not correct. Hazard analysis is a heavy-weight technique. b) Is correct. Pragmatic Risk Analysis and Management (PRAM) is a lightweight technique that can work based on stakeholder input. PRAM involves defining, assessing, and deciding on the risks that matter for the project, and using direct or indirect measures to mitigate them. PRAM is suitable for Agile projects, as it allows quick and flexible risk analysis and management without requiring formal documentation or specifications. c) Is not correct. Systematic Software Testing is a technique that requires requirements specifications which may be missing in your situation. d) Is not correct. Fault tree analysis is a time-consuming heavy-weight technique.	TM-1.3.5	K2	1

Section: Project Test Strategy					
14	c	a) Is not correct. Test types and test techniques are part of a test approach. However, test metrics are – together with the test approach – part of the test strategy. b) Is not correct. Test levels and test techniques are part of a test approach. However, test entry/exit criteria are – together with the test approach – part of the test strategy. c) Is correct. Choosing a test approach is about making key decisions concerning test levels, test types and test techniques. d) Is not correct. Test levels and test techniques are part of a test approach. However, test deliverables are – together with the test approach – part of the test strategy.	TM-1.4.1	K2	1
15	a	a) Is correct. Risk-based testing helps to focus on the most important aspects of testing in terms of quality, reliability, and customer satisfaction, while also considering the constraints of budget, time, and resources. Risk-based testing also supports Agile testing by allowing frequent adjustments of test priorities based on feedback and changes. b) Is not correct. Model-based testing requires a high initial investment in creating and maintaining models, which may not be feasible given the budget and time constraints. Model-based testing also assumes that the requirements are stable and complete, which may not be the case in an Agile project. c) Is not correct. Experience-based testing relies heavily on the testers' skills and knowledge, which may vary among the test team members. Experience-based testing also lacks objective criteria for test coverage and quality, which may not meet the customer's expectations. d) Is not correct. Acceptance testing most likely does not cover all of the aspects of quality and reliability that are relevant for the banking sector such as security, performance, usability, etc.	TM-1.4.2	K4	3

16	a	a) Is correct. Risk-based testing helps to prioritize the test objectives and test cases based on the security, performance, and reliability risks, while white-box testing helps to verify the internal structures and logic of the web application. Pairing testers and developers is helpful to cover the customer's requirements and enable a high degree of automation. This test approach is suitable for Agile SDLC models and requires skilled testers. b) Is not correct. Model-based testing is more suitable for embedded software development than web application development. The test approach does not check the internal structures and logic of the web application, which are important for security, performance, and reliability. Moreover, the demo is probably insufficient as acceptance testing in the context of online banking. c) Is not correct. Exploratory testing relies on the testers' intuition and creativity. Although usability is typically an issue concerning web applications, this is not a given quality characteristic to be tested. Exploratory testing may not be consistent or sufficient for testing the security, performance, and reliability aspects of the web application. Agile SDLCs that have different roles for development and test typically also do have at least two different test levels and most do. d) Is not correct. The given approach focuses on verifying the functionality and quality of the web application against the specified requirements and criteria, but does not address the security, performance, and reliability risks that may arise from the web application's environment, interfaces, or data.	TM-1.4.2	K4	3

17	b	a) Is not correct. This goal is not specific or measurable enough. What are "serious" defects and how is the "user experience" measured? This is not a S.M.A.R.T. test objective, as it is vague and subjective. It does not define what are “planned functions”, “serious defects”, or “user experience”. b) Is correct. This is a S.M.A.R.T. test objective, as it specifies the expected defect rate, the measurement method, the scope of the test, and the deadline for the test. This test objective is also relevant for the e-commerce website, as it focuses on the functionality of the site’s features. c) Is not correct. This is not a S.M.A.R.T. test objective, as it may be unrealistic or unattainable. It does not consider the complexity and limited resources of the project, which may affect the reliability of the e-commerce system. d) Is not correct. This is not a S.M.A.R.T. test objective, as it is not specific enough. It does not define what are “defects found in beta testing” or how they are compared to the last development phase. It also does not provide any time limit for achieving this goal.	TM-1.4.3	K3	2

18	a	a) Is correct. This is specific, measurable, attainable, relevant, and timely. It is specific because it defines what aspect of usability to check and how to measure it. It is measurable because it has a quantifiable criterion for measuring progress. It is attainable because it is feasible within the given resources, time frame, and capabilities. It is relevant because it is aligned with the overall project objectives and expectations. It is timely because it has a defined deadline, which is the end of each iteration b) Is not correct. This is not specific, relevant, or timely. It is not specific because it does not define what level of automated tests means or how to measure it. It is not relevant because it is not aligned with the overall project objectives and expectations. It is not timely because it does not have a defined deadline, which could be the end of each release or iteration. c) Is not correct. This is not measurable or timely. It is not measurable because it does not have specific criteria for measuring progress or determining whether it has been reached. It is not timely because it does not have a defined deadline, which could be the end of each release or iteration. d) Is not correct. This is not attainable or relevant. It is not attainable because it is not feasible within the given resources, time frame, and capabilities. It is not relevant because it is not aligned with the overall project objectives and expectations.	TM-1.4.3	K3	2

Section: Improving the Testing Process					
19	a	a) Is correct. It's the third step of the IDEAL process and should follow the steps that have already been carried out so far b) Is not correct. It's the fourth step of the IDEAL process, and thus creating a plan should be carried out before c) Is not correct. This is the first step of the IDEAL process and has already been carried out. d) Is not correct. This is the second step of the IDEAL process and has already been carried out.	TM-1.5.1	K2	1
20	c	a) Is not correct. The syllabus states that model-based improvement can be performed both at an organizational and project level b) Is not correct. Rather than taking all TMMi level 2 and level 3 process areas into account it would be much more beneficial to consider the process areas that are especially project related (see justification for answer C). c) Is correct. Per syllabus (see section 1.5.2, "Test Maturity Model integration (TMMi)"). Additionally, the syllabus mentions the specific "TMMi in the Agile world" guideline that would be beneficial here. d) Is not correct. The scrum guide does not provide details on how to do test improvement. It is not mentioned in the syllabus as an option to do so.	TM-1.5.2	K2	1
21	a, e	a) Is correct. We want to analyze defect information to evaluate whether the quality risk analysis was correct in a retrospective b) Is not correct. While a good issue to consider in a retrospective, it is a project-wide issue, not a test-related issue. This retrospective is focusing on the test (see description of the exam question). c) Is not correct. This is supposed to happen during the implementation process and is not part of the test improvement process d) Is not correct. This is part of test control and is not part of the retrospective e) Is correct. This check is important. The earlier defects are found, almost always the more cost-effective it is	TM-1.5.4	K3	2

22	d	a) Is not correct. Reviewing the test progress, defect detection, and test effectiveness metrics are part of the test evaluation process, which is one of the areas to be considered in a retrospective b) Is not correct. Identifying the root causes of the testing problems and generating improvement ideas is part of the problem analysis and solution generation process, which is one of the areas to be considered in a retrospective c) Is not correct. Assigning responsibilities and defining goals and metrics for the improvement actions are part of the action planning and implementation process, which is one of the areas to be considered in a retrospective d) Is correct. NOT part of a typical retrospective. Evaluating the test processes and tools against the industry best practices is NOT part of a typical retrospective, but typically part of test process improvement activities.	TM-1.5.4	K3	2

Section: Test Tools					
23	a	a) Is correct. The successor of the currently used tool might have advantages like licensing but if you have not done a requirements analysis, you might not know if the successor fills all of your requirements. Also there might not be a successor. b) Is not correct. The answer is being listed as a best practice for tool selection in section 1.6.1. c) Is not correct. The answer is being listed as a best practice for tool selection in section 1.6.1. d) Is not correct. The answer is being listed as a best practice for tool selection in section 1.6.1.	TM-1.6.1	K2	1

24	c	a) Is not correct. This is a valid concern, as open-source tools may not have the same level of documentation, training, and technical support as commercial tools. However, this is not the key concern, as you can look for online communities, forums, and tutorials that can help you with the tool. Moreover, the fact that another software product line within your company is using the tool suggests that there is some internal knowledge and experience that you can leverage. b) Is not correct. This is also a valid concern, as user-friendliness can affect the ease of learning, using, and maintaining the tool. However, this is not the key concern, as user-friendliness is subjective and depends on the preferences and skills of the users. You can evaluate the user-friendliness of the tool by trying it out yourself or asking for feedback from the other software product line that is using it. c) Is correct. This is the key concern, as written in the syllabus, text automation requires a certain level of test process maturity to be effective and efficient. According to the TMMi model, a framework for evaluating the maturity of software testing processes, test automation is best implemented at level 3 (defined) or higher, where test processes are standardized, integrated, and measured across the organization. Based on the scenario, your business unit seems to be at level 2 (managed), where test processes are established and controlled, but may vary from project to project. Therefore, you need to assess whether your business unit is ready to move to the next level of maturity and adopt test automation using the tool. d) Is not correct. This is another valid concern, as test automation involves creating and managing various artifacts, such as test scripts, test data, test results, and test reports. However, this is not the key concern, as the maintainability of the artifacts depends on the quality and design of the tool, as well as the best practices and standards followed by the users. You can evaluate the maintainability of the artifacts by reviewing the existing ones created by the other software product line that is using the tool.	TM-1.6.3	K4	3

25	c	a) Is not correct. Tool A is not the best option, because it has the lowest benefit and the lowest ROI among the three tools. Although Tool A has the lowest initial and recurring costs, it also has the lowest reduction in effort and time and the lowest increase in coverage. Tool A only supports functional testing, which is not sufficient for testing an agile software development project. Tool A: Initial cost = $10,000 Recurring cost = $2,000 per year Benefit = (20% x $50 x 1000 hours) + (15% x $500 x 100 defects) = $15,000 Final value = ($10,000 + $15,000) - $2,000 = $23,000 ROI = ($23,000 - $10,000) / $10,000 x 100 = **130%** b) Is not correct. Tool B is not the best option, because it has the same ROI as Tool A, but a higher initial and recurring cost. Tool B has a moderate level of usability and maintainability, and it supports both functional and performance testing. However, Tool B does not support security testing, which is also important for testing an agile software development project. Tool B: Initial cost = $15,000 Recurring cost = $3,000 per year Benefit = (30% x $50 x 1000 hours) + (25% x $500 x 100 defects) = $22,500 Final value = ($15,000 + $22,500) - $3,000 = $34,500 ROI = ($34,500 - $15,000) / $15,000 x 100 = **130%** c) Is correct. Based on the ROI calculations, the best option is c) Tool C, because it has the highest ROI among the three tools. This means that Tool C provides the most benefit relative to its cost, and therefore, the most value for the project. Tool C has the highest reduction in effort and time and the highest increase in coverage, which are important factors for improving the quality and efficiency of testing. Tool C also supports functional, performance, and security testing, which are essential for testing an agile software development project.	TM-1.6.3	K4	3

		Tool C: Initial cost = $20,000 Recurring cost = $4,000 per year Benefit = (40% x $50 x 1000 hours) + (35% x $500 x 100 defects) = $32,500 Final value = ($20,000 + $32,500) - $4,000 = $48,500 ROI = ($48,500 - $20,000) / $20,000 x 100 = **142.5%** d) Is not correct. None of the tools is not the best option, because all of the tools provide a positive ROI, which means that they are profitable and worthwhile investments. None of the tools have a negative ROI, which would indicate that they are losing money and not providing any value for the project.			
26	b	a) Is not correct. This activity is not necessary because the old tool will be retired. b) Is correct. This answer concerns retirement, as there are probably lots of existing scripts, and regression test scripts are the ones used most often. This is because: • Regression test scripts are the ones that are used most often to verify the functionality and performance of the software after changes or updates. • Converting the regression test scripts to the new tool will allow you to show the value of the new tool as quickly as possible, as you can compare the results and efficiency of the new tool with the old one. c) Is not correct. This activity is not necessary because the old tool will be retired. d) Is not correct. Even if you would like, it is not realistic to convert all the scripts if you can manage with just regression test scripts.	TM-1.6.4	K2	1

Section: Test Metrics					
27	c	1. The percentage of product risk coverage is a test monitoring and test control metric. 2. The number of defected critical and non-critical defects is a test monitoring and test control metric. 3. The percentage of planned vs. automated test cases is a test completion metric. 4. The ratio of the estimated number of hours required to test activities versus the project total number of hours is a test monitoring and test control metric. 5. The number of archived testware artifacts is a test completion metric. Hence the correct answer is c) **1B, 2B, 4C, 3C, 5C**.	TM-2.1.1	K2	1
28	a	a) Is correct. Test metrics are used to measure test progress and to assess whether the test exit criteria or the test tasks associated with the exit criteria or test objectives have been met. This statement is true because test metrics can help to track the status and outcome of the testing activities, such as the number of test cases executed, the number of defects found, the defect density, the test coverage, the test effectiveness, and so on. These metrics can help to evaluate whether the testing process has achieved the desired level of quality and completeness, and whether the software product is ready for release or not. b) Is not correct. This statement describes the role of test control, not test metrics. Test control uses the information from test monitoring, which is based on test metrics, to provide guidance and corrective actions. c) Is not correct. This statement describes the role of test closure, not test metrics. Test closure collects data from completed test activities, which may include test metrics to consolidate lessons learned, testware, and other relevant information. d) Is not correct. This statement is false because it describes an example of a control directive, not a test metric. Test metrics may be used to support the decision of reprioritizing tests, but they are not the direct cause of it.	TM-2.1.2	K2	1

29	d	a) Is not correct. This option is not recommended because it does not address the root cause of the problem, which is the lack of alignment between the hardware and software development schedules. Adding more tests may increase the testing effort and time, but it may not improve the quality of the software or the risk coverage. Moreover, adding more tests without a clear strategy or criteria may result in redundant or ineffective tests. b) Is not correct. This option is not recommended because it is subjective and unreliable. The testers' opinions about the developer capabilities may not reflect the actual quality of the software or the risks involved. Moreover, this option does not provide any measurable metrics or tools to improve the testing process or the project management. c) Is not correct. This option is not recommended because it is based on an invalid assumption. The statement coverage is a measure of the code coverage, not the risk coverage. The statement coverage does not guarantee that all the risks or functionalities are tested adequately. Moreover, this option does not address the issue of the hardware and software development synchronization, which may affect the testing schedule and the integration testing. d) Is correct. This option is based on the idea of measuring the confidence level of the testers in the quality and reliability of the software product, as well as the adequacy and completeness of the test cases. A confidence evaluation can help to identify the areas of uncertainty and risk, and to prioritize the testing activities accordingly. A confidence evaluation can also help to communicate the test results and the test status to the stakeholders, and to provide feedback for the development team. Moreover, this option can help to improve the testing process and the project management by identifying the gaps, issues, and improvement areas.	TM-2.1.3	K4	3

30	a	a) Is correct. As it covers all the categories of metrics that are relevant for the project context. • **Metrics related to product risks** are needed to assess the quality and reliability of the system and comply with the legal regulations. • **Metrics related to defects** are needed to measure the defect density, severity, removal efficiency, etc. • **Metrics related to test progress** are needed to monitor and control the test activities and resources. • **Metrics related to coverage** are needed to measure the extent to which the test basis and the system under test are exercised by the tests. • **Metrics related to costs** and test effort are needed to evaluate the cost-benefit relationship of testing and optimize the test budget. b) Is not correct. It does not include metrics related to product risks and costs and test effort, which are important for the project context. Moreover, it includes code coverage metrics, which are not suitable for reporting higher level test results in a document-centric sequential development model. c) Is not correct. It does not include metrics related to product risks and costs and test effort, which are important for the project context. Moreover, it includes environment/configuration coverage, which are not applicable for a document-centric sequential development model that aims to achieve high levels of coverage. d) Is not correct. It does not include metrics related to product risks and costs and test effort, which are important for the project context. Moreover, it includes residual costs for untested components metrics, which are not applicable for a document-centric sequential development model that aims to achieve high levels of coverage.	TM-2.1.3	K4	3

Section: Test Estimation					
31	d	a) Is not correct. The complexity and size of the software under test affect the scope and depth of the testing activities and tasks, which in turn influence the test effort, time and cost. b) Is not correct. The availability and skills of the test team members determine the productivity and efficiency of the testing process, which in turn influence the test effort, time and cost. c) Is not correct. The quality and reliability of the test tools and environment affect the feasibility and accuracy of the testing activities and tasks, which in turn influence the test effort, time and cost. d) Is correct. The number and severity of the defects found during testing are the outcomes of the testing process, not the inputs. They do not directly affect the test estimation, although they may have an impact on the test execution and reporting.	TM-2.2.2	K2	1

32	a, b	a) Is correct. It is a way of applying risk-based testing, which is part of the testing strategy. By using historical data from past iterations, the test manager can estimate the effort needed to test the most critical and likely risks in the current iteration. b) Is correct. It is a way of applying reactive testing, which is part of the testing strategy. By using test charters, which are high level descriptions of test objectives, the test manager can allocate a fixed amount of time for each exploratory test session, which allows for flexibility and adaptability in testing. c) Is not correct. It contradicts the assumption that developers are following known Agile best practices, including automated unit testing and continuous integration. These practices should ensure that most defects are found and fixed at an early stage, reducing the defect density at system test level. d) Is not correct. This option is incorrect because it contradicts the Agile principle of working software over comprehensive documentation. In an Agile context, detailed test work product documentation is not necessary or desirable, as it adds overhead and reduces agility. Instead, the test manager should focus on creating lightweight and concise test documentation that supports communication and collaboration. e) Is not correct. It contradicts the principle of independence of testing. System tests should not rely on unit test data and environments, as they may not be representative or realistic enough for system level testing. Instead, the test management role should ensure that system tests have their own dedicated test data and environments that match the intended operational conditions.	TM-2.2.3	K4	3

33	a	a) Is correct. Estimation based on ratios is a metrics-based technique that uses historical data from similar projects to derive standard ratios for test effort. This technique is suitable for waterfall model, where the project requirements and scope are fixed and well-defined. Moreover, this technique can provide a quick and simple estimate for the entire project based on percentages of the overall project effort or staffing levels. b) Is not correct. Planning Poker is an expert-based technique that is commonly used in Agile software development. In Planning Poker, estimates are carried out using cards with numbers that represent the amount of effort. The test team members discuss and compare their estimates until they reach a consensus. This technique is not suitable for waterfall model, where the test team may not have enough involvement or collaboration in the early stages of the project. Moreover, this technique may be too time consuming and impractical for estimating the test effort for the entire project. c) Is not correct. Three-point estimation is an expert-based technique that involves providing the most optimistic, most likely, and most pessimistic estimates for each test task. The differences of the estimates provide information about the confidence in the estimate. This technique can be useful for dealing with uncertainty and variability in test effort, but it may not be as effective as estimation based on ratios for providing a simple and consistent estimate for the entire project. Moreover, this technique may require more information and expertise than what is available in the requirements specification document. d) Is not correct. Delphi method is more suitable for projects where the test effort is difficult to quantify, and where the experts have different perspectives and experiences.	TM-2.2.3	K4	3

Section: Defect Management					
34	b	a) Is not correct. Because the phase in which a defect was introduced does not affect whether a defect report is created or not. A defect report should be created for any defect that causes a failure, regardless of when it was introduced. b) Is correct. This is the case in test-driven development, where component tests are used as a form of executable design specification. Until the development of the component is complete, some or all of the tests will fail. Therefore, the failure discovered by such a test is not necessarily caused by a defect and is typically not tracked by the defect workflow. c) Is not correct. Because an invalid test that does not match the requirements specification should be corrected or removed, but it does not prevent the creation of a defect report for the failure it causes. A defect report should be created for any failure that reveals a discrepancy between the actual results and the expected results of a test. d) Is not correct. A false-negative result occurs when the tester does not observe the anomaly that causes a failure. However, this does not mean that a defect report is not created. A defect report should be created for any anomaly that is observed, either by the tester or by other means (e.g., logs, reports, alerts).	TM-2.3.1	K3	2

35	b	a) Is not correct. RETESTED makes sense after RESOLVED. RE-OPENED is entered usually from RESOLVED if the confirmation test indicates that the defect is not fixed. b) Is correct. From the initial OPEN and the IN PROGRESS the defect report may be rejected (hence transition to REJECTED). If more information is needed from the reporter, the CLARIFICATION state may be used. c) Is not correct. While DUPLICATE state might fit the situation, the TERMINATED as state Y does not work as the workflow continues after this state back to previous state. d) Is not correct. RESOLVED and FIXED are often synonymous – so not both are needed. REJECTED as state Y does not work the workflow continues after this state back to previous state.	TM-2.3.1	K3	2
36	c	a) Is not correct. It makes no sense to defer a defect that's already fixed and closed. b) Is not correct. RESOLVED is not a terminal state. c) Is correct. It corresponds to the most common path through the defect workflow, where a defect report is opened when it is detected, moved to in progress when it is assigned and fixed, resolved when it is verified and confirmed, and closed when it is accepted and archived. d) Is not correct. A defect report can't be in the IN PROGRESS before it's even reported.	TM-2.3.2	K2	1
37	b	a) Is not correct. It is a good practice to create the defect report if work on the fix cannot commence early after detection. b) Is correct. It is common practice in Agile teams to informally discuss defects with developers. Depending on the findings during this discussion, a defect report may be created afterward. c) Is not correct. When cooperation of more teams is needed the syllabus recommends creating a defect report. d) Is not correct. If the defect is not going to be fixed within the current iteration, it should be stored in the product backlog in the form of a defect report.	TM-2.3.3	K2	1

38	c	a) Is not correct. While it is efficient to use one defect management tool, it is not a must. b) Is not correct. Frequency of the defect management committee meetings should not be dictated by the size of the team. c) Is correct. Defect management in hybrid environments is the process of identifying, tracking, and resolving defects across different teams that use different methodologies, such as Agile and waterfall. It is a challenging task that requires coordination and collaboration among all stakeholders. According to the Syllabus text (Section 2.3.4), alignment and transparency of the plan for new developments and defect fixes among the teams. By scheduling their defect fix priorities to align with the overall project plan, Agile teams can coordinate their testing activities with other teams and stakeholders, and avoid conflicts or delays in the delivery of the software product. d) Is not correct. According to the Syllabus text (Section 2.3.4), sometimes it is beneficial for a smaller group of defect management stakeholders to have the final word about prioritization.	TM-2.3.4	K2	1
39	b	According to the syllabus text (Section 2.3.5), the data items that are mandatory for managing defect reports in most environments are: - A defect title with a short summary of the anomaly - A detailed description of the anomaly often including steps to reproduce the failure - Severity of the impact on the system under test and/or the product stakeholders - Priority to fix the anomaly a) Is not correct. This is a mandatory data item for managing defect reports. b) Is correct. Option b is not mandatory. Option b is an example of a data item that may be collected depending on context to help defect resolution, but it is not required for managing the defect report. c) Is not correct. This is a mandatory data item for managing defect reports. d) Is not correct. This is a mandatory data item for managing defect reports.	TM-2.3.5	K3	2

40	b, c	a) Is not correct. The third party already knows that these defect reports are coming from system testing. b) Is correct. These steps (and actual results) will help them understand the defect and the expected results will confirm that the testers understood what was expected. c) Is correct. The third party needs this information to aid their prioritization. d) Is not correct. Technical type of the defect will be determined by the person assigned by the third party to fix the defect. e) Is not correct. Phase of detection is already available (system test), and phase of removal is not known.	TM-2.3.5	K3	2
41	b	a) Is not correct. The detection and removal information are not useful for reducing defect introduction. b) Is correct. This will help to analyze when and why defects are currently introduced, and so we can target activities to prevent future defect introduction. c) Is not correct. This is used for defect clustering information to target components that need extra testing – but does not directly help prevent defects. d) Is not correct. This tells us how efficient we are at removing defects – it does not help with reducing the introduction of defects.	TM-2.3.6	K2	1

Section: Test Team					
42	d	a) Is not correct. Ability to apply test techniques to design test cases is an example of professional competence, as it involves specific knowledge and skills to deal with specialist tasks. b) Is not correct. Ability to communicate test results to stakeholders is an example of social competence, as it involves knowledge, skills, and abilities in relation to communication and cooperation. c) Is not correct. Ability to manage test tasks and resources is an example of professional competence, as it involves specific knowledge and skills to deal with specialist tasks such as project management. d) Is correct. Ability to learn new technologies and tools is an example of methodical competence, as it involves general knowledge, skills, and abilities that enable the independent completion of complex and new tasks. This shows that the test team member can adapt to changing and emerging situations and challenges, and can acquire new knowledge and skills independently.	TM-3.1.1	K2	1

43	a	a) Is correct. All required skills (Black-box test techniques; communication skills; resilience; test documentation according to CTFL 4.0 Syllabus) can be determined by the given project situation (see following explanation). b) Is not correct. Programming skills and AGILE certification knowledge are not needed for the tasks of a test analyst (see following explanation). c) Is not correct. Ability to delegate work and intercultural competence are not needed for the tasks of a test analyst (see following explanation). d) Is not correct. Intercultural competence and the ability to delegate are not needed for the tasks of a test analyst (see following explanation). Explanation • CORRECT, **black-box test techniques** are required because system tests are to be designed systematically and based on requirements. • FALSE, since the company is specific for domestic customers, it can be assumed that **intercultural skills** are not necessarily required. • CORRECT, particularly in time-critical projects, a high degree of reliability and **resilience** is often required. • CORRECT, collaboration with different teams requires **communication skills** for project success. • FALSE, **knowledge of the programming language** (technical expertise) is needed for test script programming, but this is not a primary task of a test analyst. • FALSE **ability to delegate work** is necessary primarily as a test manager of a hierarchical test team There is no evidence that the Test Analyst should be responsible for leading a team. • CORRECT, The SDLC requires that the **tests must be documented according to the good practices** Working to standards is a professional skill that helps, as they represent the highest quality. • FALSE, knowledge in SCRUM (a professional skill) is an advantage, but a SCRUM certification is not necessary for the Test Analyst, because it is not a requirement to be certified.	TM-3.1.2	K4	3

44	a	a) Is correct. It covers the professional, social, and self-competence skills that are relevant for the project context. Business expertise in the gambling industry is needed to assess the functional suitability of the system and comply with the legal regulations. Technical expertise in web technologies and security vulnerabilities is needed to assess the maintainability and security of the code. Communication and cooperation skills are needed to work effectively in an Agile team and with the customer. Self-management and discipline skills are needed to work in a self-organized team and cope with uncertainty and complexity. b) Is not correct. It focuses on the test skills required for test planning, monitoring, control, analysis, and implementation, which are not specific to the project context. These skills are more relevant for document-centric sequential development models than for Agile development models. Moreover, these skills are more suitable for a test manager role than for a test team member role. c) Is not correct. It focuses on the test skills required for test design, implementation, execution, and completion, which are not specific to the project context. These skills are more relevant for technical testing than for business testing. Moreover, these skills do not cover the social and self-competence skills that are needed for working in an Agile team. d) Is not correct. It mixes up the professional competence skills that are not relevant for the project context. Business expertise in information technology is too general and does not reflect the specific domain of the gambling industry. Technical expertise in programming languages and interface technology is too broad and does not address the web technologies and security vulnerabilities that are used in the project. Knowledge about test levels, testing roles, and specific test techniques is too generic and does not account for the Agile software development lifecycle. Conflict resolution skills are not enough to ensure effective communication and cooperation in an Agile team.	TM-3.1.2	K4	3

45	c	a) Is not correct. Professional competence includes specific skills e.g., skills in test techniques to design test cases. But the task also assesses methodical competence (including general skills e.g., analytical skills to analyze a set of requirements). b) Is not correct. Methodical competence includes general skills e.g., analytical skills to analyze a set of requirements. But the task also assesses professional competence (including specific skills e.g., skills in test techniques to design test cases). c) Is correct. Methodical competence includes general skills e.g., analytical t) to analyze a set of requirements. The task also assesses professional competence (including specific skills e.g., skills in test techniques) to design test cases). d) Is not correct. Professional competence includes specific skills e.g., skills in test techniques to design test cases. However, it doesn't assess social competence that includes knowledge, skills, and abilities in relation to communication, cooperation, and conflicts, which is not covered by this given context.	TM-3.1.3	K2	1
46	d	a) Is not correct. Training is mostly done with several participants and predefined content; coaching is done individually. b) Is not correct. For developing social and self-competence, it is recommended to use approaches such as training and coaching. c) Is not correct. Mentoring and coaching is done by an experienced person. d) Is correct. Coaching is for a person who is new to a role and receives individual guidance by an experienced person. The experienced person acts as an ongoing resource to provide advice and assistance.	TM-3.1.4	K2	1

47	d	a) Is not correct. The syllabus does not make a blanket statement about the value of skills. b) Is not correct. In the first phases of establishing a test team e.g., willingness to help and the ability to resolve conflicts are more important (Forming and Storming). The ability to act with appreciation is needed more during the dissolution of a test team or a test team member. c) Is not correct. Test teams are subject to dynamic development processes. These require skills whose required levels will vary according to the team and the current situation. d) Is correct. The ability to resolve conflicts within the test team is especially needed during the storming phase.	TM-3.1.5	K2	1

Section: Stakeholder Relationships					
48	b	a) Is not correct. It does not match the correct categories of quality costs with the examples. Counterexample: Customers complaining about poor performance is an external failure cost, not an internal failure cost. (4D) b) Is correct. Performing Product risk analysis is an appraisal cost because you would incur this cost even if you found no defects (2A); customer complaints are an external failure costs because these customer complaints result in decreased future sales (4C) Training business analysts in requirements engineering is a prevention cost (1B); Long lag time from defect reporting to resolution during testing causing increased defect management inefficiency is an internal failure cost, not an external failure cost. (3D) c) Is not correct. It does not match the correct categories of quality costs with the examples. Counterexample: Performing a product risk analysis is an appraisal cost, not a prevention cost. (1A) d) Is not correct. It does not match the correct categories of quality costs with the examples. Counterexample: Customers complaining about poor performance is an external failure cost, not an internal failure cost. (4D)	TM-3.2.1	K2	1
49	b	a) Is not correct. You cannot add averages to calculate a total, and besides you weren´t given the cost of prevention. b) Is correct. Each defect found by testing offers the organization a potential savings of $5,000 - ($150 + $250) = $4,600 in cost of quality c) Is not correct. Cost of quality can be used to calculate the value of any quality-related activity and is so used in industries around the world. d) Is not correct. You must subtract the average costs of detection and internal failure associated with testing to calculate the net potential savings, rather than adding those costs.	TM-3.2.2	K3	2

50	a	a) Is correct. It matches the formula for the cost quality of testing given in the syllabus (see section 3.2.2). The cost-benefit calculation is the difference between the average external failure costs and the sum of the average prevention, appraisal, and internal failure costs. This calculation shows how much testing can save the organization by preventing defects from reaching the customers. b) Is not correct. It uses the quotient instead of the difference between the external and internal costs, leading to an incorrect result. c) Is not correct. It divides the difference between the external and internal costs by the sum of prevention and appraisal costs, leading to an incorrect result. d) Is not correct. As it uses the quotient instead of the difference between the external and internal costs, leading to an incorrect result.	TM-3.2.2	K3	2

Appendix: Answers to Additional Questions

Question Number (#)	Correct Answer	Explanation / Rationale	Learning Objective (LO)	K-Level	Number of Points
Section: Test Process					
#A1	a	a) Is correct. Per syllabus section 1.1.3, this activity ensures all test activities have been accomplished. This is part of the test closure process, which also includes other activities such as lessons learned and testware archiving. b) Is not correct. Lessons learned is a different test completion activity. c) Is not correct. This is another test closure activity. d) Is not correct. This is part of the lessons learned activity.	TM-1.1.3	K2	1
Section: Context of Testing					
#A2	c	a) Is not correct. Defining the test scope is a test management activity at the system testing level. b) Is not correct. Selecting the tools and test techniques is a test management activity at the system testing level. c) Is correct. Deciding which parts need to be integrated and tested is a test management activity at the component integration testing level, not at the system testing level. d) Is not correct. Managing defects throughout the test process is a test management activity at the system testing level.	TM-1.2.5	K2	1

#A3	c	a) Is not correct. Define the scope is a test management activity for all types of testing. b) Is not correct. Determine the test tools and test environments is a test management activity for all types of testing. c) Is correct. Measuring the coverage of statements is a test management activity for white-box testing, but not for functional or non-functional testing, as they do not require understanding the internal code structure of the system under test. d) Is not correct. Monitor test execution based on prioritization of test cases is a test management activity for all types of testing.	TM-1.2.6	K2	1
Section: Risk-based testing					
#A4	b	a) Is not correct. The unavailability of the UAT team might lead to time/resource pressures, which is a serious factor that can have an adverse effect on the quality. b) Is correct. Business analysts usually need no test automation knowledge, and if they do need it, developers and testers might help them out. c) Is not correct. A geographically distributed development team is a serious factor that can have an adverse effect on the quality. d) Is not correct. The developers being unfamiliar with the new defect management process is a qualification issue among the teams involved.	TM-1.3.3	K2	1
#A5	b	a) Is not correct. Having 10 stakeholders is not too many and they can contribute to the risk analysis from their fields. Hence this is not a difficulty. b) Is correct. Neglecting to implement risk control activities is a major difficulty in risk-based testing (“keen beginnings"). c) Is not correct. Some of the risk items and their risk levels can be relevant in other projects, so not reusing them might mean time loss to the project. However, this might lead to complacency (“Déjà-vu”) and is not the most relevant difficulty. d) Is not correct. If stakeholders understood the residual risk and decided based on this, then the risks were not missed. So this is not a difficulty; but the essence of risk-based testing.	TM-1.3.6	K2	1

Section: Improving the Testing Process					
#A6	a, c	a) Is correct. Using a company's own defect data to identify defect clusters is one aspect of root cause analysis. b) Is not correct. Assessing a company's or a project's practices against a reference model follows a model-based test improvement strategy. c) Is correct. Using metrics to quantify and assess a quality aspect of the test process (i.e., effectiveness) is one option for an analytical-based test process improvement. d) Is not correct. Deriving metrics with the GQM approach can be an option for analytical-based test process improvement, but in this scenario the goal of the measurement program does not address the problem of the project (see description of the exam question). e) Is not correct. Introduction of a new tool is a process improvement that can be part of a test process improvement plan, but in this scenario this action is not supported by any data (see description of the exam question).	TM-1.5.3	K2	1
Section: Test Tools					
#A7	b	a) Is not correct. Personal preferences are not a valid consideration when selecting a tool. b) Is correct. That is a valid consideration when selecting a test tool from the stakeholder requirements part of the chapter. c) Is not correct. The design is not a valid consideration when selecting a tool. d) Is not correct. Financial aspects are a valid consideration of tool decisions, but there is no requirement given that says, 'You have to be cheaper when deciding on a new tool.'	TM-1.6.2	K2	1

#A8	b	a) Is not correct. Traceability is generally a valuable metric but you don't know yet if it's important for project management. You have to identify their requirements and needs first. b) Is correct. Metrics should always focus on the needs of the test team and the stakeholders, according to syllabus text, c) Is not correct. That approach may cover the needs of project management but is very inefficient. d) Is not correct. There are no specific requirements concerning acceptance criteria of defects of any priority or severity as described in the syllabus text..	TM-1.6.5	K2	1

Section: Test Estimation					
#A9	b	a) Is not correct. Test estimation in Agile projects is not done separately from development estimation, but rather as part of it. Test levels and activities are not the main drivers of test estimation in Agile projects, but rather the user stories and acceptance criteria. b) Is correct. Test estimation in Agile projects is done as part of development estimation and is based on the user stories and acceptance criteria. User stories are the main units of work in Agile projects and they define the features and functionalities that the customer wants. Acceptance criteria are the conditions that the user stories must meet to be considered done and acceptable. Test estimation in Agile projects is done by estimating the effort and time required to test the user stories and their acceptance criteria. c) Is not correct. Test estimation is not skipped in Agile projects and testing is not performed on an ad-hoc basis. Testing is an integral part of Agile projects and is done continuously throughout the development cycle. Test estimation is done to plan and allocate the testing resources and activities in an efficient and effective way. d) Is not correct. Test estimation is not done by the customer or the product owner, but rather by the development team. The customer or the product owner may provide the business value and risk of the features, but they are not responsible for estimating the testing effort and time. The development team, which includes the testers, is responsible for estimating the testing effort and time based on their skills, experience, and knowledge of the system.	TM-2.2.1	K2	1

#A10a	a	a) Is correct. This option will most likely influence the duration, but not the effort of the testing activities. The duration of testing depends on how long it takes to find and fix the defects, while the effort depends on how many resources are allocated to the testing process. If the time to repair defects is high, then the testing process will take longer, but it will not necessarily require more effort from the testers. b) Is not correct. This option will most likely influence both the duration and the effort of the testing activities. The maturity of the test process refers to how well-defined, standardized, and optimized the testing process is. A mature test process will usually result in shorter and more efficient testing, while an immature test process will likely lead to longer and more costly testing. Therefore, this option affects both the duration and the effort of testing. c) Is not correct. This option will most likely influence both the duration and the effort of the testing activities. The level of detail of test conditions refers to how specific and comprehensive the test cases are. A higher level of detail will require more time and effort to design, execute, and evaluate the test cases, while a lower level of detail will result in less time and effort for testing. Therefore, this option affects both the duration and the effort of testing. d) Is not correct. This option will most likely influence both the duration and the effort of the testing activities. The required quality of the system refers to how high or low the quality standards are for the system under test. A higher quality requirement will demand more rigorous and extensive testing, while a lower quality requirement will allow for more relaxed and limited testing. Therefore, this option affects both the duration and the effort of testing.	TM-2.2.2	K2	1

#A10b	c	a) Is not correct. The qualification (skills, experiences and knowledge) of the development team members should be taken into consideration for test estimation. b) Is not correct. Human skills and experiences of the developers should be taken into consideration for test estimation. c) Is correct. Future projects cannot not be taken into consideration; only past, completed projects and the historical data from similar projects can be considered. d) Is not correct. The determined hours measured as a result from test effort estimation could directly derive one part of the costs.	TM-2.2.2	K2	1
Section: Test Team					
#A11	d	a) Is not correct. Remuneration and salary are hygiene factors. They do not automatically lead to greater satisfaction. If missing, they can have a demotivating effect on the team members. b) Is not correct. Micromanagement and over-regulated work instructions can have a demotivating effect on the team members. c) Is not correct. Working conditions are hygiene factors. They do not automatically lead to greater satisfaction. If missing, they can have a demotivating effect on the team members. d) Is correct. Recognition and appreciation for the work done is a factor that can motivate.	TM-3.1.6	K2	1