Sample Exam – Answers

Sample Exam set A
Version 4.2

ISTQB® Technical Test Analyst Syllabus Advanced Level

Compatible with Syllabus version 4.0

International Software Testing Qualifications Board

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Acknowledgements

Revision History

Sample Exam – Answers Layout Template used:	Version 2.5	Date: May 21, 2021

Version	Date	Remarks
4.2	November 6, 2023	Minor correction of answer: #35
4.1	April 27, 2023	Minor correction of answer: #7, #12, #29
4.0	March 1, 2021	Major update to align with syllabus v4.0
2.2	November, 2020	New template applied Removal of extra questions Updates to several questions and answers.
2.1	December 19, 2019	Revisions made by AELWG to enable launch
2.0	October 5, 2019	Release of sample exam for CTAL-TTA 2019
1.3	February 19, 2019	Correction of Pick-N type question #30
1.2	September 25, 2018	Split of document into Questions and Answers Randomize answer order Refactor layout on Sample Exam Template Correcting of Pick-N type questions Correcting of question #31 and #35
1.01	November 23, 2012	Version for release
1.00	October 19, 2012	Version for voting

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Introduction

Purpose of this document

The sample questions and answers and associated justifications in this sample exam set 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.

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.

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*

Answer Key

Question Number (#)	Correct Answer	LO	K-Level	Points	Question Number (#)	Correct Answer	LO	K-Level	Points
1	a, b	TTA-1.2.1	K2	1	24	c	TTA-4.2.4	K3	2
2	d	TTA-1.2.2	K2	1	25	b	TTA-4.2.4	K3	2
3	a	TTA-2.2.1	K3	2	26	a	TTA-4.3.2	K2	1
4	c	TTA-2.3.1	K3	2	27	b	TTA-4.4.2	K2	1
5	a	TTA-2.3.1	K3	2	28	b	TTA-4.5.2	K2	1
6	c	TTA-2.4.1	K3	2	29	d	TTA-4.6.1	K2	1
7	a	TTA-2.5.1	K3	2	30	c	TTA-4.7.1	K2	1
8	a, c	TTA-2.7.1	K2	1	31	c	TTA-5.1.1	K2	1
9	d	TTA-2.8.1	K4	3	32	c	TTA-5.2.1	K4	3
10	b	TTA-2.8.1	K4	3	33	a	TTA-5.2.1	K4	3
11	b	TTA-3.2.1	K3	2	34	c	TTA-5.2.2	K4	3
12	b	TTA-3.2.1	K3	2	35	b	TTA-5.2.2	K4	3
13	a	TTA-3.2.2	K3	2	36	b, e	TTA-6.1.1	K2	1
14	d	TTA-3.2.2	K3	2	37	a	TTA-6.1.2	K2	1
15	c	TTA-3.2.3	K3	2	38	d	TTA-6.1.3	K2	1
16	b, d	TTA-3.2.3	K3	2	39	c, d	TTA-6.1.4	K3	2
17	c	TTA-3.3.1	K3	2	40	c	TTA-6.2.1	K2	1
18	c	TTA-4.2.1	K4	3	41	b	TTA-6.2.2	K2	1
19	a, d	TTA-4.2.1	K4	3	42	d, e	TTA-6.2.3	K2	1
20	a	TTA-4.2.2	K3	2	43	a	TTA-6.2.4	K2	1
21	b	TTA-4.2.2	K3	2	44	c	TTA-6.2.5	K2	1
22	d	TTA-4.2.3	K2	1	45	d	TTA-6.2.6	K2	1
23	a	TTA-4.2.3	K2	1					

Answers

Question Number (#)	Correct Answer	Explanation / Rationale	Learning Objective (LO)	K-Level	Number of Points
1	a, b	a) Is correct. A large number of defects relating to technical quality characteristics is a generic risk factor b) Is correct. Tools and technology is a generic risk factor c) Is not correct. Accuracy of the computations is a concern for the TA, not the TTA d) Is not correct. Budgetary issues should be handled by the TM, not the TTA e) Is not correct. High change rates in business use cases affect the functionality testing	TTA-1.2.1	K2	1
2	d	a) Is not correct. The TA would be expected to work with users b) Is not correct. The TA would be expected to work with business analysts c) Is not correct. The TA would be expected to work with project sponsors d) Is correct. The TTA is expected to work with the technical stakeholders on the project, including the developers	TTA-1.2.2	K2	1

Question Number (#)	Correct Answer	Explanation / Rationale	Learning Objective (LO)	K-Level	Number of Points

3	a	a) Is correct. The three test cases are defined by the following inputs:
		   • Enough water, low fat milk, sugar
		   • Enough water, normal milk, sugar or not sugar
		   • Not enough water
		b) Is not correct. With two tests, one of the paths covered by the tests of answer (a) will be missed, and the lines of code in this path will not be tested – failing to achieve 100% statement coverage
		c) Is not correct. The question asked for the minimal number of tests to achieve 100% statement coverage. This can be achieved with 3 tests, as shown in (a)
		d) Is not correct. The question asked for the minimal number of tests to achieve 100% statement coverage. This can be achieved with 3 tests, as shown in (a)
			TTA-2.2.1	K3	2

4	c	a) Is not correct. As shown in (c), 4 tests are needed to achieve 100% decision coverage
		b) Is not correct. As shown in (c), 4 tests are needed to achieve 100% decision coverage
		c) Is correct. The following conditions ensure that all decision outcomes are tested:
		  1) A = true, B = true
		  2) A = true, B = false
		  3) A = false, C = true
		  4) A = false, C= false
		d) Is not correct. As shown in (c), 4 tests are enough to achieve 100% decision coverage
			TTA-2.3.1	K3	2
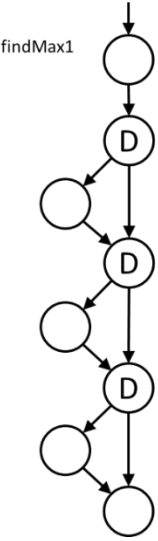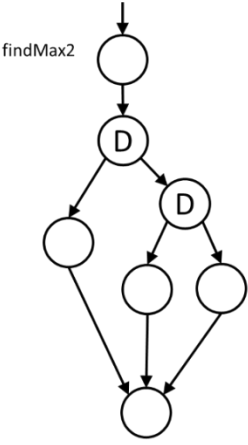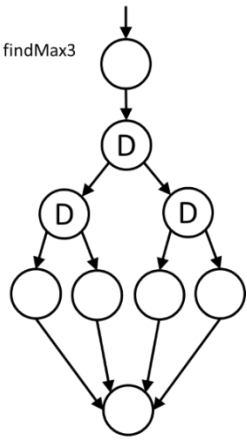
Question Number (#)	Correct Answer	Explanation / Rationale	Learning Objective (LO)	K-Level	Number of Points
5	a	There are 4 decision points in the graph, in nodes 1, 2, 4 and 6. Hence, we need to cover 8 decision outcomes: TRUE and FALSE for each of the four decisions. These correspond to the branches 1→2, 1→5, 2→3, 2→4, 4→2, 4→6, 6→7 and 6→8. One test is not enough, because it will not be able to cover both 1→2 and 1→5. Two tests, however, will be enough; for example, the first one can go along the path 1→2→3→4→2→4→6→7→9 and the second one along the path 1→5→6→8→9. The first test exercises decision outcomes 1→2, 2→3, 2→4, 4→2, 4→6 and 6→7. The second one exercises the decision outcomes 1→5 and 6→8. Hence, both tests cover all eight decision outcomes, achieving 100% decision coverage. Thus: a) Is correct b) Is not correct c) Is not correct d) Is not correct	TTA-2.3.1	K3	2

Question Number (#)	Correct Answer	Explanation / Rationale	Learning Objective (LO)	K-Level	Number of Points
6	c	a) Is not correct. Covers the outcomes but not the atomic conditions that affect the decision outcome. Also, for three independent atomic conditions, then four tests are needed to achieve MC/DC level of coverage b) Is not correct. Does not sufficiently cover the atomic conditions affecting the decision outcome. Also, for three independent atomic conditions, then four tests are needed to achieve MC/DC level of coverage. c) Is correct. This answer provides the following: Test inputs for (RED or SPEED) and WHEELS **OUTCOME** 3. RED + not SPEED + WHEELS **TRUE** 4. RED + not SPEED + not WHEELS **FALSE** 5. not RED + SPEED + WHEELS **TRUE** 7. not RED + not SPEED + WHEELS **FALSE** #3 and #7 show that RED can independently affect the overall outcome. #5 and #7 show that SPEED can independently affect the overall outcome #3 and #4 show that WHEELS can independently affect the outcome. d) Is not correct. Does not sufficiently cover the atomic conditions affecting the decision outcome. #1 combined with any of the other three (#5, #7, #8) cannot show that any single condition can independently affect the overall outcome	TTA-2.4.1	K3	2

Question Number (#)	Correct Answer	Explanation / Rationale	Learning Objective (LO)	K-Level	Number of Points
7	a	a) Is correct. Multiple condition testing requires testing the entire truth table (all combinations of true and false possible which equals 2^N, where N is the number of uncoupled atomic conditions). So, this example requires 8 tests. 50% coverage is achieved with any 4 separate tests from the list b) Is not correct. This answer provides 3/8 (37.5%) coverage of the multiple condition testing c) Is not correct. This answer provides 5/8 (62.5%) coverage of the multiple condition testing d) Is not correct. This answer provides 2/8 (25%) coverage of the multiple condition testing	TTA-2.5.1	K3	2
8	a, c	a) Is correct. Transaction issues are listed under types of defects found by API testing b) Is not correct. Code standards violations are targeted by maintainability testing c) Is correct. Data handling issues are listed under types of defects found by API testing d) Is not correct. This low-level programming issues are addressed by unit testing e) Is not correct. Issues on GUI cannot be targeted by API testing since it is executed on lower levels of system architecture than GUI	TTA-2.7.1	K2	1

Question Number (#)	Correct Answer	Explanation / Rationale	Learning Objective (LO)	K-Level	Number of Points
9	d	a) Is not correct. This is the same as MC/DC, because decision coverage is subsumed by MC/DC b) Is not correct. This is the same as decision coverage because statement coverage is subsumed by decision coverage. Decision coverage, however, provides a lower level of rigor than MC/DC or multiple condition coverage c) Is not correct. MC/DC is required for the highest-level criticality software according to IEC 61508, but this scenario requires the level of testing to exceed this, so this is not a correct option d) Is correct. MC/DC is required for the highest-level criticality software according to IEC 61508, which is presumably because several thousand spectators could be killed/injured. Multiple condition coverage provides a higher level of coverage than MC/DC and as this 'exceeds' that provided by MC/DC this is the correct option for this scenario	TTA-2.8.1	K4	3

Question Number (#)	Correct Answer	Explanation / Rationale	Learning Objective (LO)	K-Level	Number of Points
10	b	a) Is not correct. Multiple condition testing is the most thorough technique, but for a decision with 20 independent atomic conditions we would have to design 2^{20} = 1,048,576 tests to achieve full multiple condition coverage, which would be impossible to finish in one month (if at all) b) Is correct. This is a medical, safety-critical system, whose failure or malfunction may result in death or serious injury to people. Therefore, it must be tested thoroughly. Full multiple condition coverage is impossible to achieve (see answer a), hence, MC/DC is the most reasonable choice as it is stronger than decision testing, but, compared to multiple condition testing, requires only a linear number of test cases – for example, the decision with 20 conditions requires only 21 test cases to achieve full MC/DC coverage c) Is not correct. Decision testing is a relatively weak criterion compared to MC/DC, and so not suitable for a safety-critical system d) Is not correct. There is no information about API in this scenario. Also, this would not guarantee the thorough level of testing required for such a safety-critical system	TTA-2.8.1	K4	3
11	b	a) Is not correct. See the correct justification for details b) Is correct. The decision at line 10 will always be true as var1 will always be 5 at line 10, thus line 13 is unreachable. The loop at line 5 can only be left if var2 is 10 or more, but each time through the loop var2 is reset at line 7 back to 4 and only incremented by 1 in the loop at line 15, so it only ever reaches 5 c) Is not correct. See the correct justification for details d) Is not correct. There is only one entry point to the WHILE loop (with the control flow 4 → 5)	TTA-3.2.1	K3	2

Question Number (#)	Correct Answer	Explanation / Rationale	Learning Objective (LO)	K-Level	Number of Points
12	b	The control flow graphs of all three functions are presented in the figure. One can see that findMax2 has 2 decision points (marked with symbol "D"), so its cyclomatic complexity equals 3, while findMax1 and findMax3 have 3 decision points, so their cyclomatic complexity equals 4. Hence: Thus: a) Is not correct b) Is correct c) Is not correct d) Is not correct	TTA-3.2.1	K3	2

Question Number (#)	Correct Answer	Explanation / Rationale	Learning Objective (LO)	K-Level	Number of Points
13	a	a) Is correct. The variable 'total' is used at line 6 before it is defined. The variable 'commission_lo' is defined at line 12 with no subsequent use b) Is not correct. The variable 'number' is a valid value to assign to the variable 'total': The variable 'commission_lo' is not defined before line 12 c) Is not correct. The variable 'total' is in scope at line 6 Use of the "hard-coded" value "0.15" is not a data flow anomaly d) Is not correct. The variable 'number' is defined at line 4. The variable 'total' is defined at line 6, and not redefined before line 12	TTA-3.2.2	K3	2
14	d	a) Is not correct. This pair represents a correct definition-use (du) sequence for sales b) Is not correct. Barrels is defined at line 3 and used at line 4, so the definition at line 19 takes place after a use. A use then definition sequence is not an anomaly c) Is not correct. totalBarrels is defined at line 2, then may be used at line 5, and is used at line 8, so the definition at line 18 takes place after a use of totalBarrels – a use then definition sequence is not an anomaly d) Is correct. At line 13 commission is defined and then in line 14 it is defined again, without any use between these two definitions. This is a definition-definition sequence, which is an anomaly	TTA-3.2.2	K3	2

Question Number (#)	Correct Answer	Explanation / Rationale	Learning Objective (LO)	K-Level	Number of Points
15	c	Cyclomatic Complexity (CC) indicates the number of independent paths tough the code. The higher the CC number, the worse code maintainability is likely to be, hence system W and Y should be addressed in this area. Cohesion (CH) is a measure to which a module is self-contained and focused on a single task. The lower it is, the worse the code maintainability is likely to be. Hence system Y should be addressed in this area. Coupling (CP) is a measure of the degree to which modules rely on each other. The higher it is, the worse the code maintainability is likely to be. Hence system X should be addressed in this area. Commented Code (CO) indicates how much of the code is documented by comments. Less comments indicates worse code maintainability. Hence systems X and Z should be addressed in this area. Repeated code instances (RE) count how many code instances are duplicated. The higher the number, the worse the code maintainability is likely to be. Hence systems W and Z should be addressed in this area. Thus: a) Is not correct b) Is not correct c) Is correct (W – CC & RE, X – CP & CO, Y – CC & CH, Z – CO & RE) d) Is not correct	TTA-3.2.3	K3	2

Question Number (#)	Correct Answer	Explanation / Rationale	Learning Objective (LO)	K-Level	Number of Points
16	b, d	a) Is not correct. The code is clearly structured with control elements (e.g., loop, if-then-else). Static analysis is unlikely to identify any improvements to the control structure b) Is correct. Variable naming used in the program does not clearly indicate what the variable represents. Static analysis can apply naming convention rules which would identify these maintenance issues in the program and recommend that the variables be given names that are readable and conform to any applicable naming rules c) Is not correct. There are no global variables defined and no other programs called. Coupling is not an improvement area d) Is correct. Static analysis identifies code which has a low level of commenting compared to executable code. Since the program has no comments at all, this would be highlighted as an area for improving code maintainability e) Is not correct. Static analysis can apply indentation rules but in the case of the TRICKY program there is already adequate indentation	TTA-3.2.3	K3	2
17	c	a) Is not correct. Dynamic analysis is not typically used for measuring response times (it requires instrumentation and so makes response time measurement impractical). Response times on user actions also cannot identify bottlenecks in the system. Dynamic analysis instead provides lower-level performance metrics to be used for performance tuning b) Is not correct. Control flow graphs are generated by static analysis c) Is correct. Dynamic analysis can identify memory access violations caused by a wild pointer and these could be causing the 'occasional' crashes d) Is not correct. The scenario tells us that automated garbage collection was used, so it is unlikely programmers will need to release memory	TTA-3.3.1	K3	2

Question Number (#)	Correct Answer	Explanation / Rationale	Learning Objective (LO)	K-Level	Number of Points
18	c	a) Is not correct. While subsequent releases of this system may be tested with real customer data, this is a new system and no existing customer data is available b) Is not correct. There is no indication this is a distributed system c) Is correct. It is highly likely the bank is required by regulation to encrypt the customer financial data, which has testing implications d) Is not correct. It is not clear whether this system will be used in-house (thus a production environment might be available) or sold to customers (thus production environments would likely not be available)	TTA-4.2.1	K4	3
19	a, d	a) Is correct. The requirements stated by the customer for performance efficiency are vague and must be made more precise before the specialist tools team can implement the tests b) Is not correct. A specialist tools team can be assumed to have issues of tool acquisition and training under control c) Is not correct. A fully representative test environment has been made available d) Is correct. If components are distributed across different sites and organizations, the effort required to plan and co-ordinate the system integration tests may be significant and must be addressed in the test planning e) Is not correct. Data security considerations are not mentioned in the scenario	TTA-4.2.1	K4	3
20	a	a) Is correct. Fault-tolerance testing is part of reliability b) Is not correct. We are not worried about response time, throughput, or resource utilization here c) Is not correct. This risk does not relate to usability d) Is not correct. A change of to a different environment is not in question here	TTA-4.2.2	K3	2

Question Number (#)	Correct Answer	Explanation / Rationale	Learning Objective (LO)	K-Level	Number of Points
21	b	a) Is not correct. Adaptability testing checks whether a given application can function correctly in all intended target environments b) Is correct. Replaceability testing focuses on the ability of software components (such as databases) to replace existing components c) Is not correct. Capacity testing relates to exercising the maximum limits of a system d) Is not correct. Co-existence testing considers the degree to which a test item can function satisfactorily alongside other independent products in a shared environment	TTA-4.2.2	K3	2
22	d	a) Is not correct. Performing turnaround time tests before a production-like test environment is available is not practical as any times recorded will be unlikely to be representative of the operational turnaround times b) Is not correct. Once the system is operational, the operational data can be used to determine availability, and so availability testing using operational profiles is unnecessary c) Is not correct. Security testing may be scheduled for the unit, integration and system testing levels, but for many projects it should start earlier with reviews and static analysis d) Is correct. Since maintainability is built into the code and the documentation for each individual code component, maintainability can be evaluated early in the lifecycle without having to wait for a completed and running system	TTA-4.2.3	K2	1

Question Number (#)	Correct Answer	Explanation / Rationale	Learning Objective (LO)	K-Level	Number of Points
23	a	a) Is correct. Because reliability tests often require use of the entire system, reliability testing is most commonly performed as part of system testing b) Is not correct. Co-existence issues should be analyzed when planning the targeted production environment, but the actual tests are normally performed after system and user acceptance testing have been successfully completed c) Is not correct. Adaptability tests may be performed in conjunction with installability tests and are typically followed by functional tests to detect any faults which may have been introduced in adapting the software to a different environment d) Is not correct. Replaceability may also be evaluated by technical review or inspection at the architecture and design levels, where the emphasis is placed on the clear definition of interfaces to potential replaceable components	TTA-4.2.3	K2	1
24	c	a) Is not correct. This is a usability failure, not a security defect b) Is not correct. This is a security feature, not a security defect c) Is correct. A typical security defect d) Is not correct. If it is a defect at all, is a portability defect	TTA-4.2.4	K3	2

Question Number (#)	Correct Answer	Explanation / Rationale	Learning Objective (LO)	K-Level	Number of Points
25	b	a) Is not correct. The test plan does not target defects in the test environment, but it targets defects in the product b) Is correct. Scalability testing focuses on the ability of a system to meet future performance efficiency requirements, which may be beyond those currently required. The scenario states that the current system's response to user inputs is just below the maximum specified time, but that the number of users is expected to double over the next 12 months. There is a high risk that the planned scalability tests will show that the system fails to meet future requirements for the expected numbers of users c) Is not correct. There is no indication in the scenario that the system uses disk capacity resources. Compared to option b this is less likely to be a source of defects d) Is not correct. The scenario states that "At present the system runs reliably" - which suggests it does not have issues related to long time operation under nominal load and it is unlikely that the increase in the number of users will cause a degradation in response times when the system is run for a long time	TTA-4.2.4	K3	2
26	a	a) Is correct. This is an example of compromising confidentiality by gaining access to sensitive data by an unauthorized user b) Is not correct. We do not know if the event of gaining access to sensitive data can be proven to have taken place. To test for non-repudiation test steps concerning the server log-files are typically required c) Is not correct. We do not know if such an SQL injection attack can be traced uniquely to the person that performed it. To test for accountability, log-files must typically be checked against specific actions by authorized and non-authorized users d) Is not correct. Availability tests in the security context are typically performed by simulating denial-of-service scenarios	TTA-4.3.2	K2	1

Question Number (#)	Correct Answer	Explanation / Rationale	Learning Objective (LO)	K-Level	Number of Points
27	b	a) Is not correct. The Product owner may have provided input on what the load is expected to be, but they are unlikely to know the expected load in sufficient detail b) Is correct. The operational profile should define how the system is expected to be used in normal conditions c) Is not correct. The Scrum Master may not be a subject matter expert on reliability and is unlikely to know the expected load in sufficient detail d) Is not correct. Although the test environment requirements will include the ability to generate loads based on the operational profile, they will not define those loads	TTA-4.4.2	K2	1
28	b	a) Is not correct. Code reviews are useful in performance efficiency testing (see the justification for the correct answer) b) Is correct. According to syllabus (4.5.7) reviews are of particular relevance when planning performance efficiency tests. Performance issues may result from poorly designed code, for example from inefficient algorithms. Code reviews can detect such issues c) Is not correct. Code reviews are useful in performance efficiency testing (see the justification for the correct answer) d) Is not correct. The test environment has nothing to do with the fact that code reviews are useful in performance efficiency testing. Hence, although the statement that test environments do not need to be designed for code reviews is correct, this is not the reason that code reviews are useful for performance efficiency testing	TTA-4.5.2	K2	1

Question Number (#)	Correct Answer	Explanation / Rationale	Learning Objective (LO)	K-Level	Number of Points
29	d	a) Is not correct. Analyzability should be considered if you do expect a lot of problems identified within the system b) Is not correct. Modifiability should be considered if you do expect several problems to be identified within the system c) Is not correct. Modularity should be considered in the context of changes to components, while the responsibility for the maintainability of a COTS system normally lies with the providers of the system, who will have to maintain it d) Is correct. Reusability addresses the degree to which an asset can be used in more than one system, or in building other assets	TTA-4.6.1	K2	1
30	c	a) Is not correct. The test appears to be for installability, which is not a form of maintainability testing, it is a type of portability testing b) Is not correct. The test appears to be for installability, which is not a form of reliability testing, it is a type of portability testing c) Is correct. The test appears to be for installability, which is a type of portability testing d) Is not correct. The test appears to be for installability, which is not a form of compatibility testing, it is a type of portability testing	TTA-4.7.1	K2	1
31	c	a) Is not correct. This response indicates a willingness to co-operate in getting the review done but the analyst will be unable to make a full contribution without preparation and the review would therefore be less effective than it should be b) Is not correct. This response flags up the lack of preparation time but does not insist on allowing time for adequate preparation c) Is correct. The reviewer has raised the lack of preparation time and has suggested a solution to solve this issue d) Is not correct. This response is accurate, but preparation is about making a review as effective and efficient as possible. This is a requirement and an advantage of formal reviews	TTA-5.1.1	K2	1

Question Number (#)	Correct Answer	Explanation / Rationale	Learning Objective (LO)	K-Level	Number of Points
32	c	a) Is not correct. Data caching helps with performance, not memory use b) Is not correct. Transaction concurrency uses more memory than running transactions sequentially c) Is correct. This would reduce unnecessary memory use but does have the possible problem of a delayed response when instantiation is performed d) Is not correct. Connection pooling can help memory and performance, but the possible problem is running out of connections, not losing a transaction	TTA-5.2.1	K4	3
33	a	a) Is correct. Load balancing should ensure that peak volumes of traffic can be handled by spreading the load among available servers b) Is not correct. Caching data may provide fast response times but may not guarantee that rapidly changing currency rates are accurately shown in real-time c) Is not correct. Object orientation practices do not target performance efficiency d) Is not correct. Data replication may not guarantee that the constantly changing currency rates are accurately shown in real-time	TTA-5.2.1	K4	3
34	c	a) Is not correct. The comment is correct – the code does check the validity of the card b) Is not correct. It is unlikely that there is an external library available that provides this functionality c) Is correct. It is unlikely that invalid 'Discover' cards will be entered more often than valid cards, so it is most likely the card will be Visa or MasterCard, and so that check should be performed first d) Is not correct. The 'else' handles all conditions not met by the preceding 'if' statements	TTA-5.2.2	K4	3

Question Number (#)	Correct Answer	Explanation / Rationale	Learning Objective (LO)	K-Level	Number of Points
35	b	a) Is not correct. The variable "fileID" is checked before attempting to access the sales file (see lines 6, 7 and 8) b) Is correct. On line 22 the divisor "number_of_months" is not checked for 0. This should be checked before line 22 is executed c) Is not correct. Comments and code are consistent d) Is not correct. All declared variables (lines 1 and 2) are used in the code	TTA-5.2.2	K4	3
36	b, e	a) Is not correct. Test data design is normally the responsibility of the test analysts or business analysts b) Is correct. Scheduling the automation project and allocating time for maintenance are typically the responsibility of the TTA c) Is not correct. Writing test scripts is not part of the set-up of a test automation project d) Is not correct. Who performs test analysis and design (even of automated test cases) is not decided by the TTA e) Is correct. Defining the interface requirements between the automation tool and the existing test management tool is typically the responsibility of the TTA	TTA-6.1.1	K2	1

Question Number (#)	Correct Answer	Explanation / Rationale	Learning Objective (LO)	K-Level	Number of Points
37	a	a) Is correct. Keyword-driven tests can use a data-driven approach, but also have process-based keywords b) Is not correct. Data-driven test automation is not keyword-driven and so does not extend it. Keyword-driven testing requires test scripts that contain high-level keywords and supporting files (e.g., also data files) that contain low-level scripts, whereas data-driven testing only uses data files to contain the test data and expected results c) Is not correct. Keyword-driven tests are typically easier to maintain (due to the additional separation of business logic from test script implementation) d) Is not correct. Additional skills in the implementation of keywords as test automation code and the design of the keyword-driven framework mean that keyword-driven test automation typically requires more skills than data-driven test automation	TTA-6.1.2	K2	1
38	d	a) Is not correct. The elimination of duplicated information across tools is a positive for a toolset b) Is not correct. Ideally data should be exchanged between tools with no manual intervention c) Is not correct. Using an IDE is often worthwhile if the tools 'fit' the IDE d) Is correct. In any test automation design, it is important to anticipate and handle software failures	TTA-6.1.3	K2	1

Question Number (#)	Correct Answer	Explanation / Rationale	Learning Objective (LO)	K-Level	Number of Points
39	c, d	a) Is not correct. The keywords are supposed to be about the business process supported by the application, not the test process b) Is not correct. The keywords are supposed to be about the business process supported by the application, not the test process c) Is correct. It is explicitly mentioned in the scenario as being a capability of the application d) Is correct. It is explicitly mentioned in the scenario as being a capability of the application e) Is not correct. This might be a capability of the application, but it is not mentioned in the scenario, so it is not the most likely keyword on the list, and also since there was no mention that the product charges its customers	TTA-6.1.4	K3	2
40	c	a) Is not correct. Input checking can be done by mutating test inputs, but to test input checking the inputs would need to be mutated b) Is not correct. This is the task of the fault injection tools c) Is correct. The mutated code is executed against the test suite to determine how well the test suite can detect the mutations (defects) d) Is not correct. These tools are generally used by the technical test analyst, or the developer when testing newly developed code	TTA-6.2.1	K2	1
41	b	a) Is not correct. If the accurate measurement of response times was an issue, then the tools would have to drive the application using its user interface b) Is correct. Performance testing tools are used to generate defined loads based on operational profiles c) Is not correct. The script needs to be changed to take account of the variability of different users and their transactions d) Is not correct. Measurements need to be taken during execution	TTA-6.2.2	K2	1

Question Number (#)	Correct Answer	Explanation / Rationale	Learning Objective (LO)	K-Level	Number of Points
42	d, e	a) Is not correct. This describes an MBT tool b) Is not correct. This describes a debugger c) Is not correct. This describes a fault seeding tool d) Is correct. Tools for testing websites may include the functionality to check for violations of accessibility standards, such as Section 508 in the U.S. or M/376 in Europe e) Is correct. Tools for testing websites may include the functionality to scan through server code, checking for orphaned (unlinked) files previously accessed by the website	TTA-6.2.3	K2	1
43	a	a) Is correct. The required behavior represented in the model (e.g., state model, Petri Net) is typically used to automatically generate many test cases corresponding to the required behavior b) Is not correct. MBT tools do execute the model of the test object's behavior, but they do this to generate test cases which are then executed on the test object to identify defects c) Is not correct. MBT tools use a model of required behavior, not an internal view of the test object, to generate test cases d) Is not correct. MBT tools generate test cases to achieve a level of coverage of the model of required behavior, rather than of the test object source code (to which they have no access)	TTA-6.2.4	K2	1
44	c	a) Is not correct. According to the syllabus, component tests are executed by other tools after build is completed b) Is not correct. The statement about component test tools is true, especially with Java. The statement about build automation tools is not correct. Component test execution is triggered after build completion, by other tools c) Is correct. Both statements are true d) Is not correct. Most component testing tools are language-specific, and the build must be done before component test execution	TTA-6.2.5	K2	1

Question Number (#)	Correct Answer	Explanation / Rationale	Learning Objective (LO)	K-Level	Number of Points
45	d	a) Is not correct. An emulator is not restricted to initial functional tests – it can also be used for tests later in the life cycle, and for non-functional tests b) Is not correct. An emulator may allow functional as well as non-functional tests. Although most usability testing will and should be done on real devices, early usability tests such as a heuristic evaluation might be done using an emulator c) Is not correct. Versions that run on an emulator should also run on the real devic d) Is correct. The purpose of an emulator is to test device-specific behaviour of an application as early as possible – even if the device is not available to the tester	TTA-6.2.6	K2	1

Appendix: Answers to Additional Questions

Question Number (#)	Correct Answer	Explanation / Rationale	Learning Objective (LO)	K-Level	Number of Points
X1	b	a) Is not correct. This is more likely to be an installability concern, not a security concern. If users cannot access their account, the security risk is reduced b) Is correct. This is an example of a reason for considering security testing given in the syllabus: "Software which exhibits unintended side-effects when performing its intended function" c) Is not correct. This is an installability concern, not a security concern d) Is not correct. This is a performance concern, a not security concern	TTA-4.3.1	K2	1
X2	a	a) Is correct. Testing a system's fault tolerance to hardware and OS defects is part of reliability testing, and we use fault injection testing to create defects in hardware or in the OS to occur b) Is not correct. This relates to performance efficiency testing c) Is not correct. Vulnerabilities leading to a denial of service would be associated with security testing d) Is not correct. This relates to performance efficiency testing	TTA-4.4.1	K2	1

Question Number (#)	Correct Answer	Explanation / Rationale	Learning Objective (LO)	K-Level	Number of Points
X3	a, d	a) Is correct. The ability of the web servers to support the expected peak number of transactions is a risk that can be addressed by performance testing b) Is not correct. If the expected peak load was defined to be too high (rather than too low), then it is unlikely to lead to a risk high enough to need mitigating by performance testing c) Is not correct. Re-using functional tests is not a reason for conducting performance tests. Being able to reuse test cases is a bonus, but not a reason. Performing the tests and analyzing the results is still extra effort that needs justification d) Is correct. People may abandon the site if their enquiry responses take too long, which may occur during the peak month. This is a risk that can be addressed by performance testing e) Is not correct. Having skills in performance testing tools is good, but it is not a reason to conduct performance tests	TTA-4.5.1	K2	1
X4	a	a) Is correct. This is an example of co-existence testing, and co-existence is a sub-characteristic of compatibility b) Is not correct. This is an example of replaceability testing, and replaceability is a sub-characteristic of portability, not compatibility c) Is not correct. This is an example of functional testing. Compatibility testing is testing of a non-functional characteristic d) Is not correct. This may be relevant to maintainability testing but has nothing to do with compatibility testing	TTA-4.8.1	K2	1