

Sample Exam – Answers

Sample Exam set A
Version 1.2

ISTQB® Model-Based Testing Syllabus Foundation Level

Compatible with Syllabus version 1.1

International Software Testing Qualifications Board



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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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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*

Answer Key

Question Number (#)	Correct Answer	LO	K-Level	Points
1	d	Term “MBT”	K1	1
2	b	MBT-1.1.1	K2	1
3	b	MBT-1.1.2	K2	1
4	d	MBT-1.2.1	K2	1
5	b	MBT-1.2.2	K1	1
6	a	MBT-1.3.1	K2	1
7	a	MBT-1.3.2	K2	1
8	d	MBT-2.1.1	K3	1
9	a	MBT-2.1.2	K3	1
10	c	MBT-2.1.3	K2	1
11	c	MBT-2.1.4	K2	1
12	a	MBT-2.2.1	K1	1
13	a	MBT-2.2.2	K2	1
14	c	MBT-2.3.1	K1	1
15	b	MBT-2.3.2	K2	1
16	b	MBT-2.3.3	K2	1
17	b	MBT-2.3.4	K2	1
18	b	MBT-2.3.5	K2	1
19	d	MBT-2.3.6	K1	1
20	c	MBT-2.3.7	K2	1

Question Number (#)	Correct Answer	LO	K-Level	Points
21	c	Term “Test Selection Criteria”	K1	1
22	a	Term “Model Coverage”	K1	1
23	c, d	MBT-3.1.1	K2	1
24	b	MBT-3.1.2	K3	1
25	d	MBT-3.1.3	K2	1
26	a, b	MBT-3.1.4	K2	1
27	c	MBT-3.2.1	K1	1
28	c	MBT-3.2.2	K3	1
29	c	MBT-3.2.3	K2	1
30	a	Term “Online MBT”	K1	1
31	d	MBT-4.1.1	K2	1
32	b	MBT-4.1.2	K2	1
33	c, d	MBT-4.1.3	K3	1
34	d	MBT-4.2.1	K2	1
35	a	MBT-5.1.1	K2	1
36	a	MBT-5.1.2	K2	1
37	a	MBT-5.1.3	K1	1
38	d	MBT-5.2.1	K1	1
39	b	MBT-5.2.2	K1	1
40	a	MBT-5.2.3	K1	1

Answers

Question Number (#)	Correct Answer	Explanation / Rationale	Learning Objective (LO)	K-Level	Number of Points
1	d	a) Is not correct. Model-based testing is used to generate manual or automated tests. b) Is not correct. Model-based testing supports and automates a large variety of test techniques, not only state transition testing. c) Is not correct. Model-based testing may use a large variety of modeling languages, not only business process modeling. d) Is correct. This is the definition according to glossary.	Term "MBT"	K1	1
2	b	a) Is not correct. MBT is not equivalent to test automation. It is also possible (and beneficial) to generate test cases for manual test execution. b) Is correct. A benefit of MBT is to facilitate a shared understanding of requirements between testers and other stakeholders using MBT models. c) Is not correct. Maintenance of the generated automated test scripts would also require the maintenance of the test adaptation layer. d) Is not correct. Reuse of system design models is possible, but of limited use. In particular, it is not possible to cover all project test objectives without writing a targeted MBT model.	MBT-1.1.1	K2	1
3	b	a) Is not correct. To fulfill project test objectives, testers need to drive MBT test generation and to master test techniques. b) Is correct. MBT needs to adapt to the existing test process and organization. c) Is not correct. MBT is not just a matter of tooling but impacts the test organization and process. d) Is not correct. The reuse of system design models has its limits.	MBT-1.1.2	K2	1

Question Number (#)	Correct Answer	Explanation / Rationale	Learning Objective (LO)	K-Level	Number of Points
4	d	a) Is not correct. Early testing is an important aspect of MBT. In a top-down approach, it is not necessary to know the detailed design of the system under test to start the modeling activities. b) Is not correct. MBT models should be developed on the basis of requirements AND project test objectives. c) Is not correct. Iterative and incremental development of MBT models is part of good practices in MBT. d) Is correct. The use of test selection criteria to drive test generation is part of MBT activities.	MBT-1.2.1	K2	1
5	b	a) Is not correct. Test basis are input to the MBT activities and defect reports cannot be generated from the MBT model. b) Is correct. c) Is not correct. The test strategy is part of the input for MBT. d) Is not correct. Defect reports cannot be generated from the MBT model and process guidelines are part of the input for MBT activities.	MBT-1.2.2	K1	1
6	a	a) Is correct. MBT requires new activities for testers but not new roles. b) Is not correct. MBT impacts the software development life cycle. It amends the lifecycle with modeling activities. c) Is not correct. No new roles are required. Modeling activities require testers to learn new skills and enrich current roles. d) Is not correct. MBT integrates well with common variants of sequential and agile software development.	MBT-1.3.1	K2	1

Question Number (#)	Correct Answer	Explanation / Rationale	Learning Objective (LO)	K-Level	Number of Points
7	a	<p>a) Is correct. RE does not change. In fact, RE gets earlier feedback. MBT supports requirements validation early by MBT models made.</p> <p>b) Is not correct. RE does not change. MBT analysts do not replace business analysts and do not perform requirements analysis for development, but for testing.</p> <p>c) Is not correct. RE does not change. MBT models do not replace system development models, because MBT models cover the project test objectives (which is generally not the case for system development models).</p> <p>d) Is not correct. RE does not change. Requirements Analysis is still required.</p>	MBT-1.3.2	K2	1
8	d	<p>a) Is not correct. It is possible to pass the exam without attending a training course or without individual preparation at home.</p> <p>b) Is not correct. When repeating the exam, it is also possible to pass the exam without attending a training course or without individual preparation at home.</p> <p>c) Is not correct. If the exam taker succeeds the exam, he or she may no longer repeat it.</p> <p>d) Is correct. It is not necessary to attend the training course prior to the exam.</p>	MBT-2.1.1	K3	1
9	a	<p>a) Is correct. An action “/ return money” (or equivalent) missing after “cancel”.</p> <p>b) Is not correct. As soon as “[enough money]” is true, the automaton dispenses the beverage.</p> <p>c) Is not correct. There is an outgoing transition with the trigger “take beverage” from state “finished”.</p> <p>d) Is not correct. The user may select a beverage.</p>	MBT-2.1.2	K3	1

Question Number (#)	Correct Answer	Explanation / Rationale	Learning Objective (LO)	K-Level	Number of Points
10	c	<p>Model A is a structural description of the system (class diagram above) and Model B is a behavioral description of test cases. The latter one can be recognized by the “check” action. Therefore:</p> <p>a) Is not correct. See explanation above. b) Is not correct. See explanation above. c) Is correct. See explanation above. d) Is not correct. See explanation above.</p>	MBT-2.1.3	K2	1
11	c	<p>a) Is not correct. TO-1 requires a behavioral model b) Is not correct. TO-2 requires a structural model c) Is correct. Subject and focus are correct d) Is not correct. TO-4 requires a structural system or test model</p>	MBT-2.1.4	K2	1
12	a	<p>a) Is correct. This is a UML behavior diagram. b) Is not correct. This is a UML structure diagram. c) Is not correct. This is a UML structure diagram. d) Is not correct. This is a UML structure diagram.</p>	MBT-2.2.1	K1	1
13	a	<p>a) Is correct. Usage models are well suited as a basis to derive performance tests as they represent typical usages for that system. b) Is not correct. Decision tables model logical rules of an IT system, which relate to the functionality of that system, but not to its performance. c) Is not correct. State transition diagrams may be helpful, but they are not the first choice. d) Is not correct. A structural model of the source code, such as a class diagram, is not the best information for establishing performance test scenarios, as it does not give any information about how the application behaves at the behavioral level.</p>	MBT-2.2.2	K2	1

Question Number (#)	Correct Answer	Explanation / Rationale	Learning Objective (LO)	K-Level	Number of Points
14	c	a) Is not correct. An MBT model may be syntactically correct but inadequate for the given test objective. b) Is not correct. An MBT model may be semantically correct but inadequate for the given test objective. c) Is correct. Pragmatic quality means that the MBT model fits the target. d) Is not correct. Portability has nothing to do with adequacy of the MBT model to the test objective.	MBT-2.3.1	K1	1
15	b	a) Is not correct. MBT can be used in combination with either manual or automated test execution. b) Is correct. The pragmatic aspect of models has been disregarded. The MBT model should focus on the test objective and not aim to be as complete as possible. c) Is not correct. Developing the MBT model on the basis of project test objectives is a best practice in model-based testing. d) Is not correct. An MBT model can be used to generate several test suites with different test selection criteria.	MBT-2.3.2	K2	1
16	b	a) Is not correct. With increasing number of model elements, it becomes more difficult to keep the model layout readable. b) Is correct. This linking information is mandatory to be able to generate test cases on the basis of the coverage of selected requirements. c) Is not correct. When requirements are linked with model elements, it becomes easier to analyze the impact of requirements changes, but does not support root cause analysis in case of errors in the model. d) Is not correct. In principle, code debugging is not specifically facilitated by MBT.	MBT-2.3.3	K2	1

Question Number (#)	Correct Answer	Explanation / Rationale	Learning Objective (LO)	K-Level	Number of Points
17	b	<p>a) Is not correct. MBT tools usually take only a subset of an existing modeling language as input. Defining this subset is part of possible MBT modeling guidelines.</p> <p>b) Is correct. Modeling patterns help to share common structure of MBT models within a team.</p> <p>c) Is not correct. MBT modeling guidelines are different from coding guidelines. Syntactical naming rules help foster a similar syntax and semantics of MBT models from various authors, but they should be easy to understand by non-technical stakeholders.</p> <p>d) Is not correct. Providing test cases as part of MBT modeling guidelines is not relevant.</p>	MBT-2.3.4	K2	1
18	b	<p>a) Is not correct. If a model is used to automatically generate the code, using it to generate the tests will only test the code generator (which is not the test objective of the project in general).</p> <p>b) Is correct. If adequate with the test objectives and the MBT tooling, requirements models may be reused and adapted.</p> <p>c) Is not correct. A low-level architecture model is a structural model than cannot be reused for user acceptance testing.</p> <p>d) Is not correct. A detailed implementation model is, in general, not reusable for MBT because it focuses on implementation information and not on the requirements for test purposes.</p>	MBT-2.3.5	K2	1
19	d	<p>a) Is not correct. This is a model editor that provides support for writing syntactically correct (MBT) models, but it is not the only one in the list.</p> <p>b) Is not correct. This is a model editor that provides support for writing syntactically correct (MBT) models, but it is not the only one in the list.</p> <p>c) Is not correct. This is a model editor that provides support for writing syntactically correct (MBT) models, but it is not the only one in the list.</p> <p>d) Is correct. All of the above are specialized model editors that know about the syntax of the modeling language used..</p>	MBT-2.3.6	K1	1

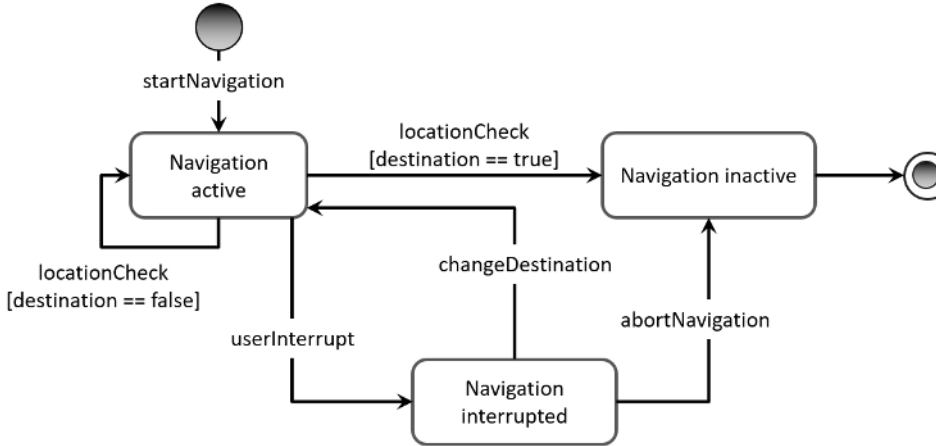
Question Number (#)	Correct Answer	Explanation / Rationale	Learning Objective (LO)	K-Level	Number of Points
20	c	<p>a) Is not correct. Especially in a top-down modeling approach, the level of detail is rather low during the first reviews.</p> <p>b) Is not correct. MBT models may also become quite complex and pure inspections, especially across different diagrams, are no longer sufficient. Validation of the generated test cases is necessary to ensure that the tests fulfill the expectations.</p> <p>c) Is correct. Iterative model development allows the MBT tester to start specifying tests early in the development process because that can be done first on a higher level of abstraction.</p> <p>d) Is not correct. MBT supports early requirement validation, but does not replace it. The focus of model validation is completely different.</p>	MBT-2.3.7	K2	1
21	c	<p>a) Is not correct. Test selection criteria have nothing to do with reviews.</p> <p>b) Is not correct. There are other ways to avoid test case explosion.</p> <p>c) Is correct. This is the definition according to glossary.</p> <p>d) Is not correct. Test selection criteria are neither part of the test adaption layer, not limited to automated test execution.</p>	Term “Test Selection Criteria”	K1	1
22	a	<p>a) Is correct. This is the definition according to glossary.</p> <p>b) Is not correct. Model coverage refers to the generated test cases (not requirements).</p> <p>c) Is not correct. Model coverage is not directly related to random coverage.</p> <p>d) Is not correct. In the MBT context, model coverage relates to the MBT model, not to the code.</p>	Term “Model Coverage”	K1	1
23	c, d	<p>a) Is not correct. This scenario describes requirement-based test selection.</p> <p>b) Is not correct. This scenario describes a situation, where transition coverage was the aim, but has not been reached.</p> <p>c) Is correct. This scenario describes scenario-based test selection.</p> <p>d) Is correct. This scenario describes project-driven test selection.</p> <p>e) Is not correct. This scenario describes a specific case of data coverage.</p>	MBT-3.1.1	K2	1

Question Number (#)	Correct Answer	Explanation / Rationale	Learning Objective (LO)	K-Level	Number of Points
24	b	<p>a) Is not correct. There is no way to cover “Room available = yes” and “Given up = yes” in one path.</p> <p>b) Is correct. It is possible to cover all decision points with two paths (e.g. “Start -> Search hotel (yes) -> Request reservation (yes) -> Confirm reservation (yes) -> End” and “Start -> Search hotel (no) -> Search hotel (yes) -> Request reservation (no) -> End”).</p> <p>c) Is not correct. It is possible to obtain 100% branch coverage with three test cases, but the minimum number is two.</p> <p>d) Is not correct. It is possible to obtain 100% branch coverage with four test cases, but the minimum number is two.</p>	MBT-3.1.2	K3	1
25	d	<p>a) Is not correct. In some sense, it is possible to tests "paths" in structural MBT models by, for example, creating objects of given types (for a class diagram) and check the relations between them defined by the edges. However, this is NOT common practice in industry.</p> <p>b) Is not correct. A business process represents business flows, NOT states and transitions.</p> <p>c) Is not correct. Gateways are a modeling element used for business process modeling, not for textual models.</p> <p>d) Is correct. Transition coverage is a common criterion for state transition diagrams.</p>	MBT-3.1.3	K2	1
26	a, b	<p>a) Is correct. For example in activity diagrams, each boundary value may be represented by an action.</p> <p>b) Is correct. Decision table is part of test techniques.</p> <p>c) Is not correct. Even if it is always recommended to work with models, use case testing without models is possible.</p> <p>d) Is not correct. MBT supports validation activities very well.</p> <p>e) Is not correct. State machine is a possible modeling language for MBT, but not the only one.</p>	MBT-3.1.4	K2	1

Question Number (#)	Correct Answer	Explanation / Rationale	Learning Objective (LO)	K-Level	Number of Points
27	c	<p>a) Is not correct. This is a common misunderstanding. An MBT approach without test generation tools has low maturity, but it is definitely an MBT approach.</p> <p>b) Is not correct. In the highest maturity approach, the model is the master and the derived artifacts are used as is without further post-processing.</p> <p>c) Is correct. A common usage of MBT is to let the tool generate test cases following some coverage criteria and to manually add some specific scenario-based tests.</p> <p>d) Is not correct. More artifacts like test scripts or traceability matrix can be automatically generated from an MBT model.</p>	MBT-3.2.1	K1	1
28	c	<p>a) Is not correct. In the note, the probabilities are given to be used by stochastic test case selection.</p> <p>b) Is not correct. The entire model is not really apt to test the workflow.</p> <p>c) Is correct. Selecting specific paths is exactly the idea of scenario-based test selection. An example for such a scenario is: Create request 1, Solve request 1, Create request 2, Create request 3, Solve request 3, View statistics</p> <p>d) Is not correct. We know nothing about the requirements. To apply requirements coverage as selection criterion, we need at least a link to a requirement in the MBT model.</p>	MBT-3.2.2	K3	1
29	c	<p>a) Is not correct. Combining test selection criteria is a good MBT practice.</p> <p>b) Is not correct. This is only true for composition of criteria (intersection).</p> <p>c) Is correct. We may add the test cases obtained with different test selection criteria to obtain a larger set of test cases, which fits the test objective better.</p> <p>d) Is not correct. This is a possible, but not the only way to combine test selection criteria.</p>	MBT-3.2.3	K2	1

Question Number (#)	Correct Answer	Explanation / Rationale	Learning Objective (LO)	K-Level	Number of Points
30	a	a) Is correct. This is the definition according to glossary. b) Is not correct. Automated test execution is not a specific characteristic of online MBT (with respect to offline MBT). c) Is not correct. Online and offline MBT are two different MBT approaches, which differ in the way the test cases are generated. Online MBT requires even more automated tool support than offline MBT. d) Is not correct. Online MBT is not specifically related to project-based coverage criteria.	Term "Online MBT"	K1	1
31	d	a) Is not correct. The MBT model developed so far in the project does not contain sufficient information to generate low-level test cases for automated execution. b) Is not correct. It is possible to add the required information on detailed test actions and data values in the MBT model and to generate low-level test cases using the same MBT tool as before. c) Is not correct. It strongly depends on the degree of abstraction of the MBT model, whether an experienced tester will be able to execute the generated test cases. However, the tester qualification has to be domain- (and even project-) specific to enable him or her. d) Is correct. The information provided by the test team about the test cases, the keywords used in the test cases and the test data is needed to develop and validate the implementation of the adaptation layer.	MBT-4.1.1	K2	1

Question Number (#)	Correct Answer	Explanation / Rationale	Learning Objective (LO)	K-Level	Number of Points
32	b	a) Is not correct. MBT is used with manual and automated test execution. b) Is correct. Offline MBT test execution is often linked with exporting of generated tests to the test management tool. c) Is not correct. In principle, online test execution cannot be used with manual test execution (because of the large number of tests obtained from the MBT model). d) Is not correct. Offline test execution means that the test cases are generated first and executed afterwards.	MBT-4.1.2	K2	1

Question Number (#)	Correct Answer	Explanation / Rationale	Learning Objective (LO)	K-Level	Number of Points
33	c, d	<p>a) Is not correct. Distractor; This may be a part of a possible alternative solution, but in the given situation, it is wrong, because it short-circuits the state “Navigation interrupted”.</p> <p>b) Is not correct. Distractor; This may be a part of a possible alternative solution, but in the given situation, it is wrong, because it short-circuits the state “Navigation interrupted”.</p> <p>c) Is correct. see figure below</p> <p>d) Is correct. see figure below</p> <p>e) Is not correct. There is no decision this guard refers to.</p> <div style="text-align: center;">  <pre> stateDiagram-v2 [*] --> startNavigation startNavigation --> active active --> active : locationCheck [destination == false] active --> inactive : locationCheck [destination == true] active --> interrupted : userInterrupt interrupted --> active : changeDestination interrupted --> inactive : abortNavigation inactive --> [*] </pre> </div>	MBT-4.1.3	K3	1

Question Number (#)	Correct Answer	Explanation / Rationale	Learning Objective (LO)	K-Level	Number of Points
34	d	a) Is not correct. The test team generates manual test scripts, so testers do NOT need to read the MBT model during manual test execution b) Is not correct. The answer is true for automated test execution, but not in general. c) Is not correct. The test automation engineer implements the test adaptation layer according to information, which may be contained in the MBT model or provided externally. d) Is correct. It is a good practice to keep the MBT model at a higher abstraction level and to separate logical aspects from implementation details.	MBT-4.2.1	K2	1
35	a	a) Is correct. Process automation reduces effort due to reduced manual errors. Reuse reduces effort in general. b) Is not correct. Rather it increases the testing costs, since a higher number of test cases leads to increasing test execution effort. c) Is not correct. Rather it may increase the testing costs, since an improvement in systematic coverage for itself leads to a higher coverage and thus may lead to a higher number of test cases compared to a set of manually created test cases increasing the test execution effort. d) Is not correct. This can lead to a financial benefit for the product vendor (e.g. due to higher market acceptance) but it will not lead to direct financial benefits for the test project.	MBT-5.1.1	K2	1

Question Number (#)	Correct Answer	Explanation / Rationale	Learning Objective (LO)	K-Level	Number of Points
36	a	a) Is correct. Combining test selection criteria and coverage monitoring improves the quality of testing. b) Is not correct. Separate models for development and MBT activities (enabling the tester’s mindset and encouraging independence) help to improve the quality of testing. c) Is not correct. High degree of process automation including the generation of test artifacts and the execution of tests to reduce human errors d) Is not correct. Functional testing requires that behavioral aspects are modeled.	MBT-5.1.2	K2	1
37	a	a) Is correct. b) Is not correct. In this context, MBT is used for acceptance testing and has no impact on code development. c) Is not correct. In this context, MBT is used for acceptance testing and has no impact on component testing. d) Is not correct. The spent effort is not the best measure for progress in this context.	MBT-5.1.3	K1	1
38	d	a) Is not correct. MBT can be used for manual and automated testing. The risk is higher for projects using test automation. b) Is not correct. Configuration management should be used for MBT models. c) Is not correct. Using MBT automated test scripts in continuous integration is a good practice. d) Is correct. Traceability between requirements and MBT model elements is mandatory to produce the traceability matrix between test cases and requirements and to apply requirement coverage-based test selection.	MBT-5.2.1	K1	1

Question Number (#)	Correct Answer	Explanation / Rationale	Learning Objective (LO)	K-Level	Number of Points
39	b	a) Is not correct. MBT modeling is a running cost. b) Is correct. Evaluating tools is an initial cost. c) Is not correct. Test adaptation efforts are running cost. d) Is not correct. Tooling is a running cost (because of tool maintenance).	MBT-5.2.2	K1	1
40	a	a) Is correct. The export of generated test cases into the test management tool is a good practice. b) Is not correct. Most MBT tools provide features to configure different output formats and, thus, generate automated test scripts in a format compatible with the test automation framework. c) Is not correct. Usually, requirements are imported into the MBT tool to support traceability. d) Is not correct. In some cases, it is possible to mirror execution results back into the MBT model, but this required specific tool support and is not common practice.	MBT-5.2.3	K1	1