



Surname, Forename:_		
Gender:	□ male	□ female
Company address:_		
_		
_		
Telephone:_		
Fax:_		
E-mail-address:_		
Invoice address:_		
_		
_		
_		
Training provider:		
Trainer:		

CTFL-Automotive Software Tester Sample Exam Paper

Syllabus Version 2.0

Written by: GermanTestingBoard e.V. – Examination Panel

(SET CTFL_AuT_2018A)

According to ISTQB®/GTB-CTFL-exam procedures 2015

ISTQB[®] Certified Tester Foundation Level Specialist: CTFL® Automotive Software Tester (CTFL®-AuT)





Introduction

This is a Sample Exam intended to help the candidates prepare for the real examination. It provides a set of questions whose format is similar to the CTFL[®]- Automotive Software Tester (CTFL-AuT) real exam.

It is strictly forbidden to use these exam questions in a real exam.

- Any individual or accredited training company may use this Sample Exam paper in a training course if ISTQB[®] is acknowledged as the source and copyright owner of the Sample Exam.
- 2) Any individual or group of individuals may use this Sample Exam as the basis for articles, books, or other derivative writings, if ISTQB[®] and GTB[®] are acknow-ledged as the source and copyright owner of the Sample Exam paper.
- 3) For almost every question exactly one correct answer is expected. In any exception to this rule, the possibility of multiple answers will be explicitly mentioned.

General terms of the Sample Exam:

Number of questions: 40

Duration of the exam: 60 minutes

Total number of points: 40 (each question scores exactly one point)

Number of points to achieve the passing score (in real exam): 26 (or more)

Percentage to pass the (real) exam: 65% (or more)

Notice of Disclaimer & Limitation of Liability

No representation or warranty is made that the information is technically accurate or sufficient or conforms to any statute, governmental rule or regulation, and further, no representation or warranty is made of merchantability or fitness for any particular purpose or against infringement of intellectual property rights. In no event shall ISTQB® or GTB be liable for lost profits or other incidental or consequential damages. ISTQB® and GTB expressly advise any and all use of or reliance upon this information provided in this document is at the risk of the user. No recommendation as to products or vendors is made or should be implied.





Questions for the topic "Introduction"

1. What are the six stages in the system product life cycle according to ISO/IEC 24748?

		K1
a)	Concept, Development, Acceptance, Utilization, Support, Retirement	
b)	Concept, Development, Production, Release, Support, Retirement	
C)	Concept, Implementation, Production, Utilization, Support, Retirement	
d)	Concept, Development, Production, Utilization, Support, Retirement	

2. Which of the following statements is TRUE?

a)	The release recommendation of the Certified Automotive Software Tester does NOT have any influence on the release.	
b)	The release provisions of the test object do NOT have any influence on the work of the Certified Automotive Software Tester.	
c)	The release recommendation of the Certified Automotive Software Tester does NOT have any influence on the level of maturity of the corresponding software.	
d)	The release recommendation does NOT have any influence on the scope of delivery.	

K1





3. With which of the measures listed below can the objectives of an increasingly complex software development project be best achieved in the short run?

a)	By insourcing an outsourced projects	
b)	By using effective methods and processes	
c)	By ensuring efficient qualification of employees	
d)	By outsourcing of complex projects	





Questions for the topic "Standards for the testing of E/E-Systems: Automotive SPICE®"

4. Which Automotive SPICE process is particularly important from the point of view of an employee in the role of a Certified Automotive Software Tester?

		K1
a)	System requirements analysis	
b)	Configuration management	
c)	Software qualification test	
d)	Project management	

5. Which of the following is a dimension defined in Automotive SPICE?

0.		K1
a)	Process dimension	
b)	Time dimension	
C)	Resource dimension	
d)	Objective dimension	





6. According to Automotive SPICE® 3.x, which Software Test Qualification Process Capability Level is characterized by a combination of the following statements?

Work products have been reviewed, established and have been released.

AND

Process activities are planned towards objectives, monitored and adjusted

AND

Requirements for work products are defined.

		K2
a)	Capability level 0	
b)	Capability level 1	
c)	Capability level 2	
d)	Capability level 3	

7. Imagine you are participating in an Automotive SPICE® – Assessment in your role as integration tester and you are receiving the information that your process has been assessed as "L," using the process attribute PA 1.1.

Which ONE of the following options is correct?

a)	"L" not fulfilled	
b)	"L" partly fulfilled	
c)	"L" largely fulfilled	
d)	"L" fully fulfilled	

K1





8. Which of the following statements about regression test strategy is TRUE, according to Automotive SPICE®?

	Intol, abboraing to Automotive of follo.	K2
a)	The regression test strategy defines the test stage specific test environ- ments and which tests are to be executed in which test environments.	
b)	The regression test strategy defines the selection of appropriate test cases for regression testing, including a set of test cases selected as a basis set to be executed.	
c)	The regression test strategy typically defines the cross-test stage proce- dure for the selection of regression tests.	
d)	The regression test strategy is an abstract description of the planned test levels and how to proceed within those test stages. It is valid for one organization or one program, for one or more projects.	

9. Which traceability requirements are referenced in Automotive SPICE® 3.x?

	5.8 :	K2
a)	Traceability of the testers' working hours to the executed test cases.	
b)	Traceability of the specified test cases to the test results.	
c)	Traceability of interface description to the specified maintainability tests.	
d)	Traceability of the customer requirements to the specified integration tests.	





10. You are the test manager for a tier-1-supplier and you are responsible for defining the component verification strategy and criteria according to Automotive SPICE® (SWE.4). The components to be verified are safety relevant ones (up to ASIL-B) as well as non-safety relevant components.

According to the process requirements of the OEM, the supplier should confirm MISRA-compliance and comply with the guidelines for functional safety.

Which of the following measures is INAPPLICABLE as part of a suitable verification strategy?

		K3
a)	Dynamic Black-Box tests of the components with the objective of achieving 100% requirements coverage for the safety relevant components.	
b)	Tool-supported measuring of the condition coverage of the tested compo- nents, to ensure 100% plausibility of the test results.	
c)	Tool-supported static analysis to achieve MISRA compliance of the source code of the components.	
d)	Code reviews to check the understandability and correctness of comments in the source code of the components.	





Questions for the topic "Standards for the testing of E/E-Systems: ISO 26262"

11. Which statement BEST describes the contribution of an Automotive Software tester to the safety culture?

		K1
a)	The tester ensures that all project team members contribute to the safety culture.	
b)	The tester checks if all processes required for functional safety activities are implemented.	
c)	The tester contributes to the development phases of the safety lifecycle.	
d)	The tester carries out all activities that are related to functional safety.	

12. Which of the following statements regarding ASIL is TRUE?

12.	Which of the following statements regarding Adie is TROE.	K1
a)	The ASIL of a hazard is the result of the hazard analysis and risk assessment.	
b)	ASIL A represents the highest criticality, ASIL D the lowest one.	
c)	An ASIL is assigned to all hazards classified.	
d)	ASIL stands for "Automotive Security Integrity Level".	





13. Which two volumes of ISO 26262 are the MOST IMPORTANT ones for the Automotive Software tester?

		K1
a)	Volume 4 (Product development at the system level), volume 6 (Product development at the software level)	
b)	Volume 3 (Concept phase) and volume 6 (Product development at the soft- ware level).	
c)	Volume 2 (Management of functional safety) and volume 6 (Product devel- opment at the software level).	
d)	Volume 5 (Product development at the hardware level) and volume 6 (Product development at the software level).	

14. Which of the following statements regarding safety aspects is TRUE?

		K2
a)	For the development of automotive E/E systems, ISO 26262 describes re- quirements to ensure functional safety.	
b)	Functional safety and cybersecurity of automotive E/E systems contradict each other.	
c)	Functional safety of an automotive E/E system can be assumed if unrea- sonable risks for people can be avoided during the normal operation of this system.	
d)	For the development of automotive E/E Systems, ISO 26262 describes the requirements to ensure cybersecurity.	





15. Which of the following statements BEST describes the contribution of an Automotive Software tester in the safety lifecycle?

	, , , , ,, _,, _	K2
a)	The tester executes tests related to functional safety primarily during the product development phase.	
b)	The tester executes tests related to functional safety primarily during the concept phase.	
C)	The tester executes tests related to functional safety to the same extent in all phases of the safety lifecycle.	
d)	The tester executes tests related to functional safety primarily during the post-release phase, while in production.	

16. ISO 26262 recommends the use of specific test design techniques and test types depending on the Automotive Safety Integrity Level (ASIL).

Which statement is TRUE?

		K2
a)	For safety requirements with a higher ASIL, more extensive testing must be done in comparison to safety requirements with a lower ASIL, as the number of recommended test design techniques and test types is higher.	
b)	For safety requirements with a higher ASIL, more extensive testing must be done in comparison to safety requirements with a lower ASIL, as the recom- mended test design techniques and test types lead to more test cases.	
C)	For safety requirements with a higher ASIL, an more extensive testing in comparison to safety requirements with a lower ASIL often occurs, as the number of recommended test design techniques and test types doubles with each ASIL.	
d)	For safety requirements with a higher ASIL, more extensive testing in com- parison to safety requirements with a lower ASIL often occurs, as the rec- ommended test design techniques and test types lead to more test cases.	





17. The following table shows a ISO 26262 methods table regarding code coverage metrics.

Methods		ASIL			
			В	С	D
1a	Statement coverage	++	++	+	+
1b	Branch coverage	+	++	++	++
1c	Modified condition decision coverage (MC/DC)	+	+	+	++

Which of the following decisions documented in the test plan is consistent with the above methods table?

		K3
a)	For ASIL A, branch coverage is used and statement coverage is not used, as 100% branch coverage implies 100% statement coverage.	
b)	For ASIL B, statement coverage is used and branch coverage is not used, as it is positioned at a higher position in the table and is therefore more important.	
c)	For ASIL D, MC/DC coverage is used as it is the only possible option.	
d)	For ASIL B, statement coverage is used and branch coverage is not used, as 100% statement coverage implies 100% branch coverage.	





Questions for the topic: "Standards for the testing of E/E-Systems: AUTOSAR"

18. Which of the following statements regarding AUTOSAR is TRUE?

		K1
a)	AUTOSAR defines a closed architecture, which can only be used by the companies, who are members of the AUTOSAR consortium.	
b)	AUTOSAR is not compliant to international standards.	
C)	AUTOSAR supports only AUTOSAR-control units.	
d)	AUTOSAR standardizes the basic functionality of the software of automo- tive control devices.	

19. Which of the following statements regarding AUTOSAR is TRUE?

		1.1
a)	The integration test of the AUTOSAR software in a virtual test environment cannot be implemented, as real hardware is necessary.	
b)	The RTE is a suitable test interface for the system test of the software.	
c)	The AUTOSAR acceptance test must be performed to prove the AUTOSAR conformity of the software.	
d)	AUTOSAR-specific tests are limited to the software of a single control de- vice.	





Questions for the topic "Standards for the testing of E/E – Systems: Comparison"

20. Which of the following statements regarding the objectives of Automotive SPICE® and the ISO 26262 is NOT TRUE?

		1 / 1
a)	Automotive SPICE® has the objective of rating the capability of the development processes of the sub-contractors by using assessments.	
b)	ISO 26262 has the objective of rating the capability of the development processes of the supplier by using assessments.	
c)	ISO 26262 has the objective of avoiding risks from systematic errors dur- ing development by specifying suitable requirements and processes.	
d)	ISO 26262 has the objective of defining requirements for the processes and methods to be used by the tester in the development of E/E-Systems.	

21. Which of the following statements is TRUE?

		K2
a)	Automotive SPICE® defines the test techniques to be used for each test level.	
b)	ISTQB defines the test techniques to be used depending on the test levels.	
c)	ISO 26262 and Automotive SPICE® define method tables for all men- tioned test levels.	
d)	Depending on the ASIL, the method tables of the ISO 26262 recom- mend test techniques that shall be used.	





Questions for the topic "Testing in virtual environment – Test environments in general "

22. Which items are part of an automotive specific test environment?

a)	Control computer, simulation software, data logger	
b)	Real-time capable computer, network accesses, report database	
c)	Measuring devices, specification documents, laboratory	
d)	Data management tool, operating system, environment model	

23. Which interfaces are used to collect and distribute information in an electronic control unit (ECU)?

		K 1
a)	Environment model, bus system and diagnosis interface	
b)	Analogue and digital inputs, watchdog and internal data memory	
c)	Analogue and digital inputs, supply voltage and diagnosis interface	
d)	Analogue and digital inputs, bus system and diagnosis interface	





24. Which of the statements is true?

		K2
a)	In a closed-loop-system, the output signals of the test object are directly linked to the inputs of the test object.	
b)	In a closed-loop-system, the output signals of the test object are linked to the inputs of the test object via an environment model.	
c)	In an open-loop-system, the output signals of the test object are directly linked to the inputs of the test object.	
d)	In an open-loop-system, the output signals of the test object are linked to the inputs of the test object via an environment model.	





Questions for the topic "Testing in virtual environment: XIL – Test environments "

25. Which of the following statements is NOT true?

	5	K1
a)	In the Model-in-the-Loop (MiL) test environment, the test object is readable for humans.	
b)	In the Model-in-the-Loop (MiL) test environment, the test object exists as a model.	
c)	In the Model-in-the-Loop (MiL) test environment, additional hardware is nec- essary.	
d)	A Model-in-the-Loop (MiL) test environment is used early in the development process.	

26. Which of the following statements is NOT true?

		K1
a)	In the Software-in-the-Loop (SiL) test environment, additional hardware is necessary.	
b)	In the Software-in-the-Loop (SiL) test environment, the test object exists as compiled object code.	
c)	In the Software-in-the-Loop (SiL) test environment, a wrapper is necessary to stimulate and observe inputs and outputs.	
d)	In the Software-in-the-Loop (SiL) test environment, the number of access points is limited by the wrapper.	





174

27. Which tests are typically performed in a Software-in-the-Loop (SiL) test environment?

		N1
a)	Tests of the response time for diagnosis requests.	
b)	Tests for electromagnetic compatibility.	
c)	Performance tests of the target hardware.	
d)	Interface and integration tests.	

28. Which three items are all parts of a Hardware-in-the-Loop (HiL) test environment?

		K1
a)	Test case generator, rest bus simulation, power supply	
b)	Breakout box, software compiler, real parts	
c)	Power supply, real-time capable computer, electric error simulation	
d)	Electric error simulation, signal processing, processor simulation	





29. Which statement regarding the test environment is true?

		K1
a)	For integration tests is only the Hardware-in-the-Loop (HiL) test environment suitable.	
b)	For component tests a Model-in-the-Loop (MiL) test environment and Soft- ware-in-the-Loop (SiL) test environment are both suitable.	
c)	For system tests, a Model-in-the-Loop (MiL) and Hardware-in-the-Loop (HiL) test environments are both suitable.	
d)	Any XiL test environment can be used on every test level.	

30. Which statement regarding a Model-in-the-Loop (MiL) test environment is most likely TRUE?

a)	The test execution duration of the simulation depends on the complexity of the model and the computing power of the test system.	
b)	Access to bus and diagnosis interfaces are implemented in the environment.	
c)	The environment model provides extensive implementations of physical pro- cesses (like for example electromagnetic compatibility or cable breaks).	
d)	The simulation of the Model-in-the-Loop (MiL) test environment can only be started and stopped. Pausing the simulation is not possible.	





31. Which test is typically performed at a Component Hardware-in-the-Loop (HiL) test environment?

		K2
a)	Test of the overall system requirements for the vehicle.	
b)	Test of the driving behavior of the chassis.	
C)	Test of the electronic control unit functions for correct behavior.	
d)	Test of the data exchange between the electronic control units.	

32. Which statement is TRUE?

		K2
a)	The cost of a detected error in the test object is highest if the error is found in the Model-in-the-Loop (MiL) test environment.	
b)	A Hardware-in-the-Loop (HiL) test environment is a more realistic test environment than a Software-in-the-Loop (SiL) test environment.	
C)	The amount of effort for design, commissioning and maintenance of a Hardware-in-the-Loop (HiL) test environment is lower than a Software-in-the-Loop (SiL) test environment.	
d)	Hardware components are tested in a Software-in-the-Loop (SiL) test environment.	





33. You are a member of a test team and you are to test the software code of an electronic control unit. The electronic control unit has been provided as a model and as a development board by the development team, as no electronic control unit hardware is available yet. The test is supposed to ensure the mechanisms for error detection and error handling in the electronic control unit work properly.

Which test environment is to be preferred in this situation given the test types?

		K3
a)	A Hardware-in-the-Loop (HiL) test environment, as errors for the test of the error handling can only be simulated in this test environment.	
b)	A Software-in-the-Loop (SiL) test environment, as development boards are available and error detection is to be tested.	
c)	A Model-in-the-Loop (MiL) test environment, as no hardware is available yet and the test object is available as a model.	
d)	If no electronic control unit hardware is available, the software cannot be tested.	





Questions for the topic "Static test techniques"

34. Which statement regarding coding standards is TRUE?

		K1
a)	A coding standard defines the necessary test practices (e.g. test tech- niques, test logging).	
b)	A coding standard defines the necessary test specification languages (e.g. test automation, test case selection).	
c)	A coding standard defines the necessary development practices (e.g. commenting, naming conventions).	
d)	A coding standard defines the necessary modelling techniques (e.g. states, state transitions).	

35. Which of the following statements regarding MISRA C:2012 is TRUE?

a)	Rules of the category required must not be neglected by the developer, even if he gives a reason.	
b)	The binding character of guidelines is predefined for every organization.	
c)	Rules of the category mandatory should avoid typical coding anomalies.	
d)	MISRA guidelines are fully testable by static analysis tools.	

K2





KЗ

- 36. The requirements for a car radio on system level are given below:
 - 1) After switching it on, the system shows the message "Welcome" for 3 seconds.
 - 2) In a switched on state, the radio is in one of the states "active", "passive" or "in maintenance" and in a switched off state the last state is saved.
 - 3) In a switched on state the radio function is engaged by pressing the button "Radio".
 - 4) If the CD function is engaged and no CD is in the drive, the system shows the message "No Disc".

Which of the following statements about the given quality criteria for requirements according to ISO/IEC/IEEE 29148 is TRUE?

		110
a)	Requirement 1 is not verifiable.	
b)	Requirement 2 is not singular.	
c)	Requirement 3 is inconsistent.	
d)	Requirement 4 is not unambiguous.	





Questions for the topic "Dynamic test techniques"

37. Which of the following statements regarding requirement based tests is CORRECT?

		K1
a)	Requirement based tests are only focused on the coverage of requirements and do not allow the use of intuitive or explorative tests.	
b)	Requirement based tests have the objective to test the requirements until they are consistent and complete.	
C)	Requirement based tests have the objective to cover requirements with test cases.	
d)	Requirement based tests verify the test object independently from the qual- ity of the customer requirements for the fulfilment of customer requests.	

38. Which of the following statements is NOT a description of a fault injection test?

		K2
a)	Fault injection tests insert faults in the behavior of external components to detect that the system can deal with erroneous situations.	
b)	Fault injection tests insert faults in internal interfaces, e.g. as lost mes- sages.	
c)	Fault injection tests insert faults in the system specification, e.g. as too low parameters for the required performance.	
d)	Fault injection tests insert faults in the operating unit that show as internal defects.	





39. What is especially important in the selection of test design techniques in the context of ISO 26262?

Choose the BEST POSSIBLE answer.

		K3
a)	White-box-test design techniques should be preferred over black-box-test design techniques, as the tester can take advantage of knowledge of the code.	
b)	The recommendation of the ISO 26262 for the identified ASIL is the deci- sive factor for the selection of the test design techniques.	
C)	The combination of the suitability of the test basis and the test level to- gether with a high risk of non-detected errors is the decisive factor for the test design techniques to be selected.	
d)	Intuitive test design techniques should always be preferred over structure based test design techniques.	





นว

40. Below is a decision with three single conditions (B1 AND B2) OR B3. The task for the tester is to design test cases according to the principle of the modified condition decision test (MC/DC).

The tester has already designed three test cases:

- 1) B1 = TRUE, B2 = TRUE, B3 = FALSE
- 2) B1 = FALSE, B2 = TRUE, B3 = FALSE
- 3) B1 = FALSE, B2 = TRUE, B3 = TRUE

Which of the following test cases is necessary to achieve 100% modified condition decision coverage?

		NЭ
a)	B1 = TRUE, B2 = FALSE, B3 = TRUE	
b)	B1 = TRUE, B2 = TRUE, B3 = TRUE	
c)	B1 = FALSE, B2 = FALSE, B3 = FALSE	
d)	B1 = TRUE, B2 = FALSE, B3 = FALSE	





Space for your notes:

(will neither be read nor rated in the correction)





Space for your notes:

(will neither be read nor rated in the correction)