Certified Tester
Advanced Level
Test Analyst (CTAL-TA)
Sample Exam – Questions

v4.0

Compatible with Syllabus v4.0

International Software Testing Qualifications Board

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Version	Date	Remarks
v4.0	2025/05/02	Major update with overall revision and scope update
v2.6	2021/09/29	Updated the purpose of document. Correction to answers: #4, #5, #7, #8, #9, #10, #11, #12, and #13
v2.5	2021/05/28	Minor correction to answer: #11, and #13
v2.4	2021/05/21	Update of Copyright Notice. Minor correction to answers: #11, #12, #13, #16, #18, #26, and #37
v2.3	2021/03/03	Updated according to CTAL-TA v3.1.0 update. Questions 10 and 11 replaced according to the changed Syllabus contents. Updates to majority of the answers
v2.2	unpublished	New template applied
v2.1	2019/12/19	Revisions made by AELWG to enable launch
v2.0	2019/10/05	Release of sample exam for CTAL-TA 2019
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v1.2	2018/12/05	Split of document into Questions and Answers. Randomize answer order. Refactor layout on Sample Exam Template. Correcting of Pick-N type answers. Correcting of answer #16 and #17. Remove broken answer #15 (and renumbering)
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Introduction

Purpose of this document

ISTQB has created the example questions and answers and associated justifications in this sample exam 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 official 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. This sample exam may be more or less difficult than any official exam.

Instructions

In this document, you may find:

- Questions, including for each question:
  - Any scenario needed by the question stem
  - Point value
  - Response (answer) option set
- Additional questions, including for each question [does not apply to all sample exams]:
  - Any scenario needed by the question stem
  - Point value
  - Response (answer) option set

Answers, including justification, are contained in a separate document.

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Questions

Question #1 (1 Point)

Why does a test analyst carry out the same activities in every increment of an incremental development model?

a) Because development is also done in cycles consisting of the same activities in every increment

b) Because the activities of the test analyst in each increment are limited to test analysis and test design

c) Because in each increment, the test analyst is involved as soon as the development begins

d) Because each increment develops a new part of the software, which needs to be tested

Select ONE Option.

Question #2 (1 Point)

During test analysis, the test analyst decides to use the 2-value boundary value analysis technique for a domain “age” representing a client’s age, which is used to determine the client’s discount. Which of the following tasks should the test analyst perform during test design?

a) Define the test condition: “The system assigns a discount for a child less than 18 and a senior older than 64.”

b) Determine whether or not the test cases should document the specific amount of the expected discounts

c) Store the identified boundary values for clients’ ages in a test data repository to support automated test execution

d) Write an automated test script using keyword-driven testing: “SetAge(18); VerifyDiscountIsNotAssigned().”

Select ONE Option.

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Question #3 (1 Point)

Based on the following (simplified) test case:

Input: age below 18
Expected output: The system assigns a children's discount

A test analyst creates the following (simplified) test script using keyword-driven testing:

EnterAge(17)
VerifyChildrenDiscountApplied(yes)
EnterAge(18)
VerifyChildrenDiscountApplied(no)

In which test activity does this action take place?

a) Test analysis

b) Test design

c) Test implementation

d) Test execution

Select ONE Option.

Question #4 (1 Point)

A medical application has an interface for a health card reader. As a test analyst, you require a simulator for the health card reader to replace the hardware devices in the system test environment. You state the following requirements for the simulator:

- The simulator shall implement the exact interface specification to the medical information system as the real devices.
- Testers with access to the system test environment shall be able to edit and manage the virtual health cards.
- The simulator shall be available during system test implementation and execution of all increments.

Which of the following information is missing and should be added?

a) A copy of the health card reader interface specification

b) The specific period of time during which the simulator is needed

c) A specific backup and restore procedure for the virtual health cards

d) The organizational unit which shall provide and maintain the simulator

Select ONE Option.

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Question #5 (1 Point)

A mobile network operator's existing rating and billing system will be replaced by new software. As rating and billing rules are very complex, the project test strategy plans to test the functional correctness with several days of live network traffic.

As a test analyst, you want to solve the test oracle problem of generating the details of expected bills for a large amount of traffic with a pseudo-oracle. Which of the following solutions can serve as a pseudo-oracle?

a) Run the existing in-house rating and billing system in the test environment to generate the expected results

b) Use test scripts to generate expected results in simple test cases and accept all other actual results

c) Run automated scripts to verify the phone call counts, durations, and types on the bills based on the traffic data

d) Selectively change the call durations in the live network traffic and verify that the bills change accordingly

Select ONE Option.

Question #6 (1 Point)

Which of the following statements about anonymized test data is MOST likely to be true?

a) Test data may lack the variability required for thorough testing

b) Test data will be restricted to input data only

c) Test data will be outdated as it is time-sensitive

d) Test data will primarily serve as keywords for keyword-driven testing

Select ONE Option.

Question #7 (2 Points)

You are testing a queueing system using keyword-driven testing. The following keywords are available:

- Start() – creates an empty queue
- Enqueue(e) - inserts element e at the end of the queue
- Dequeue() - removes an element from the beginning of the queue
- CreateQueue(e1, e2, . . . , en) – a composite keyword equivalent to the sequence of keywords: Enqueue(e1), Enqueue(e2), . . . , Enqueue(en)
- AssertFirstElement(e) - checks if there is an element e at the beginning of the queue; if not, the system returns an error message

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- AssertEmpty() - checks if the queue is empty; if not, the system returns an error message

You have designed the following test scripts:

i) Start(); Enqueue(A); Enqueue(B); Dequeue();AssertFirstElement(A)
ii) Start(); Enqueue(A); Enqueue(B); Dequeue(); AssertNonempty()
iii) Start(); Enqueue(A); Dequeue(); Enqueue(B); AssertFirstElement(B)
iv) Start(); CreateQueue(A, B); Dequeue(); Dequeue(); AssertEmpty()
v) Start(); CreateQueue(A, B); Dequeue(); AssertFirstElement(B)

Which of these test scripts verify the following acceptance criterion using the available keywords: "If more elements were added to the queue than removed, the queue is not empty"?

a) i), ii) and iii)
b) ii), iv), and v)
c) iii) and v)
d) ii) and iv)

Select ONE Option.

Question #8 (1 Point)

As a test analyst in an incremental-iterative development process, how can you BEST support the management of testware in the test management tool?

a) Defining a standard severity classification for failures in test execution
b) Specifying the pseudonymization procedure for test data extracted from the live system
c) Managing the configuration of the test environments
d) Selecting the most suitable set of test cases for regression testing

Select ONE Option.

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Question #9 (1 Point)

Which of the following are examples of how a test analyst can contribute to product risk analysis?

a) Interviewing business analysts about what can go wrong with the application

b) Determining the scope of regression testing by performing an impact analysis

c) Identifying and assessing new product risks that occur during test execution

d) Estimating the damage that each product risk may cause when it occurs

e) Applying the most suitable test techniques for each product risk

Select TWO Options.

Question #10 (3 Points)

You are given traceability information about the implemented functions (F1-F5), identified risks (R1-R5), and regression test cases (TC1-TC6) in the form of the following traceability matrices:

F\R	R1	R2	R3	R4	R5
F1	X				
F2	X	X			
F3		X		X	X
F4	X		X	X	
F5	X				X

R\TC	TC1	TC2	TC3	TC4	TC5	TC6
R1	X	X				
R2	X		X			
R3	X			X		
R4			X		X	
R5	X					X

You also have the following information about the risk levels for all of the identified risks:

Risk	Risk level
R1	$15,000
R2	$10,000
R3	$2,000
R4	$5,000
R5	$20,000

All six test cases were executed in the last test cycle. Then, you are informed that the implementation of

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F3 has changed. You follow risk-based testing and apply an impact analysis, which allows executing only the test cases affected by code changes since the last test execution.

During the next regression test suite execution, which test case should be executed LAST?

a) TC4

b) TC5

c) TC1

d) TC3

Select ONE Option.

Question #11 (3 Points)

You are system-testing a mobile banking application. The development is divided between a backend team that designs the business logic on the servers and a frontend team that designs the graphical user interface (GUI) and the application on the mobile devices. The backend team is experienced and can debug and resolve defects quickly and reliably. The frontend team has undergone a lot of staff turnover.

Recently, critical failures occurred in production and were resolved in the previous release:

- Payments rejected by the destination banks due to invalid bank account numbers. The root cause was insufficient validation of bank accounts in the mobile devices.
- Incorrectly displayed GUI elements on some screen sizes and resolutions that obstructed users when entering payments.

The next release will contain the following changes:

- A new feature was added that allows users to make payments by taking a photo of an invoice with their mobile device.
- A major defect in the calculation of the account balance was fixed.
- The navigation bar in the GUI was redesigned to comply with accessibility standards.

You have a comprehensive regression test suite with tests categorized by the impact of potential failures. Due to limited testing resources, you cannot execute them all, so you chose the history-based regression testing strategy. Which of the following test objectives suits this scenario THE BEST?

a) Execute all regression tests for the bank account validation using both photo-based and manually entered invoice payments

b) Execute all regression tests for the settlement of payments and other features related to balance calculations

c) Execute all regression tests with a critical or major risk impact of potential failures

d) Execute the regression tests of the GUI containing the navigation bar on mobile devices with various displays, prioritized by the device distribution statistics

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e) Execute at least one regression test for each requirement, prioritizing the most frequently used scenarios

Select TWO Options.

Question #12 (2 Points)

A code complexity evaluation system takes two integers as input, representing the cyclomatic complexity (CC) and the number of variables in the code (VAR). The system checks whether the code is complex based on the following model:

IF (CC $\geq$ 10) **AND** (VAR $\geq$ 8) **THEN RETURN** "the code is complex"

The domain determined by the intersection of the above two borders is a set of points in two-dimensional space with integer coordinates (CC, VAR).

You want to test the functional correctness of the implementation of this domain using domain testing.

Which set of test points could result from using the SIMPLIFIED domain coverage to test the correctness of this domain implementation?

a) (12, 7), (12, 8), (9, 10), (10, 10)

b) (6, 5), (10, 8), (13, 10)

c) (11, 8), (11, 9), (9, 11), (10, 11)

d) (10, 10), (12, 8), (15, 11)

Select ONE Option.

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Question #13 (2 Points)

The requirements for brewing espresso are:

- The pressure shall be at least 9 bars for ideal extraction.
- The temperature shall be at least 90°C and at most 96°C to prevent under-extracting or burning coffee.

You test the software controller that opens the hot water valve when pressure (P) and temperature (T) are in the right range (i.e., $P \geq 9$ AND $T \geq 90$ AND $T \leq 96$) and shuts it otherwise (i.e., $P < 9$ OR $T < 90$ OR $T > 96$). The barometer measures the pressure with a precision of 0.1 bar; the thermometer works with a precision of 0.5°C. Your test suite executes the controller with the following inputs (P, T) of pressure in bar and temperature in degrees Celsius:

A = (9, 90)
B = (9, 96)
C = (8.9, 93)
D = (10, 96.5)
E = (10, 93)
F = (8, 89)
G = (10, 98)

Which of the following inputs is missing for 100% reliable domain coverage?

a) (8, 93)

b) (9.7, 90.5)

c) (10.9, 89.5)

d) (10, 90)

Select ONE Option.

Question #14 (2 Points)

You are testing the functional correctness of a particular application on various environments, described by the following parameters and their possible values:

- operating system (possible values: Windows, Linux, iOS)
- RAM (possible values: 16GB, 32GB, 64GB)
- whether there is a USB-C port (possible values: yes, no)

Based on market research, the most common configuration is Windows OS with 16GB of memory and a USB-C port. You have already prepared the tests for the following configurations:

- Windows, 16GB, USB-C
- iOS, 16GB, USB-C

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- Windows, 32GB, USB-C
- Windows, 64GB, USB-C
- Linux, 16GB, no USB-C

Consider the following new configurations that can be tested:

i) Windows, 16GB, no USB-C
ii) Linux, 16GB, USB-C
iii) Linux, 64GB, no USB-C
iv) iOS, 32GB, no USB-C
v) iOS, 64GB, USB-C

Which of them should be added to the existing set to fully achieve the BASE CHOICE coverage criterion?

a) i) and ii)
b) iii) and iv)
c) ii), iv), and v)
d) i), iii), and v)

Select ONE Option.

Question #15 (2 Points)

A company offering house insurance policies has several policy options. They depend on the following factors:

- Building type: house, semi-detached, apartment building, cottage
- Material: wood, concrete, brick, mixed
- Location: city, suburb, countryside

Using pairwise testing, how many test cases are required to achieve 100% pairwise coverage?

a) 16
b) 12
c) 64
d) 4

Select ONE Option.

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Question #16 (1 Point)

Which difficulty of random testing can be addressed by using GUIDED random testing?

a) Lack of well-defined coverage criteria

b) Dependence on an automated test oracle

c) Redundancy of selected test data

d) Neglecting data semantics

Select ONE Option.

Question #17 (1 Point)

Which of the following is an example of CRUD testing?

a) Verifying that a user, after creating an account and defining a password, can modify the account password

b) Verifying that a system accepts, as a password, any of 1,000 randomly generated strings of various lengths

c) Verifying that the time from requesting a password change to verifying that change is less than 10 milliseconds

d) Checking whether a new user can use a password that another user has already used

Select ONE Option.

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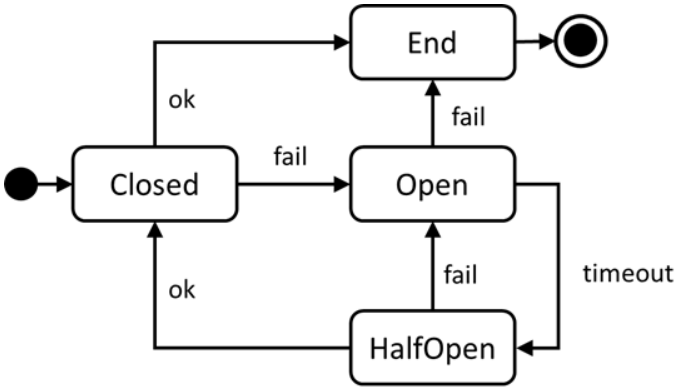
Question #18 (2 Points)

You are testing a system that implements a circuit breaker pattern. The system is modeled with the state transition diagram shown below.



All potential round trips are feasible. You have already designed the test case exercising the following sequence of states:

Closed, Open, HalfOpen, Closed, Open, HalfOpen, Open, End

What is the round trip coverage achieved by this test case?

a) 100%

b) 50%

c) 60%

d) 80%

Select ONE Option.

Question #19 (2 Points)

You are responsible for designing state-based tests for a system component that manages the lifecycle of claims for an insurance company. You have the following specification.

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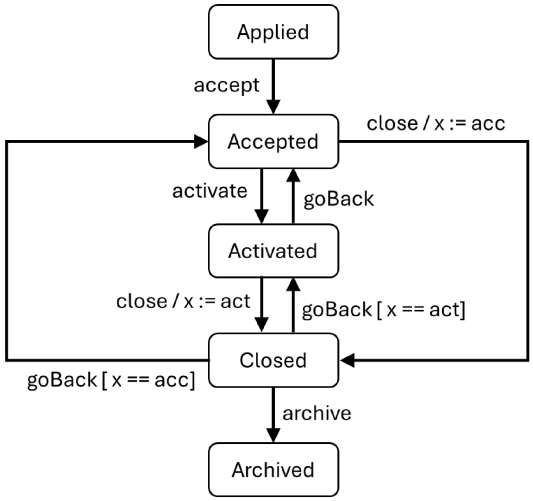

The variable x contains the claim resolution type with values 'acc' for accepted and 'act' for active. How many different 1-switches must be exercised by the resulting test suite in order to achieve 100% 1-switch coverage?

a) 16

b) 14

c) 8

d) 15

Select ONE Option.

Question #20 (2 Points)

You test a food ordering scenario based on the following use case:

1. The customer opens the application and logs in.
2. The customer browses the menu and selects items to order.
3. The customer adds selected items to the cart.
4. The customer proceeds to the checkout.
5. The application displays the order summary, including items, quantities, and total price.
6. The customer confirms the order.
7. The application asks if the saved payment method should be used.
8. The customer confirms the saved payment method.

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9. The application processes the payment.
10. The application sends a confirmation notification to the customer.
11. The application forwards the order to the restaurant.
12. The application updates the order status to "Confirmed".

Alternative scenarios:

4A. The customer goes back to browsing the menu. The scenario goes back to step 2.
6A. The customer goes back to browsing the menu. The scenario goes back to step 2.
7A. No payment method is saved. The system asks for the credit card details. The customer fills in the data. The scenario goes to step 9.
7B. More than one payment method is saved. The system asks the customer to select one of the payment methods. The scenario goes to step 9.

Exceptions:

9A. The payment process fails. The system informs the customer about the error. The use case ends.

The adopted test strategy requires testing the main scenario and all of the alternatives and exceptions. The test strategy allows more than one alternative to be tested within a single test case. However, it is forbidden to create test cases in which both an alternative and an exception would occur (i.e., if an exception occurs in a test case, no alternative can occur in it).

What is the MINIMUM number of test cases that will cover all the scenarios for this use case?

a) 2

b) 3

c) 4

d) 5

Select ONE Option.

Question #21 (2 Points)

Consider the following activity diagram.

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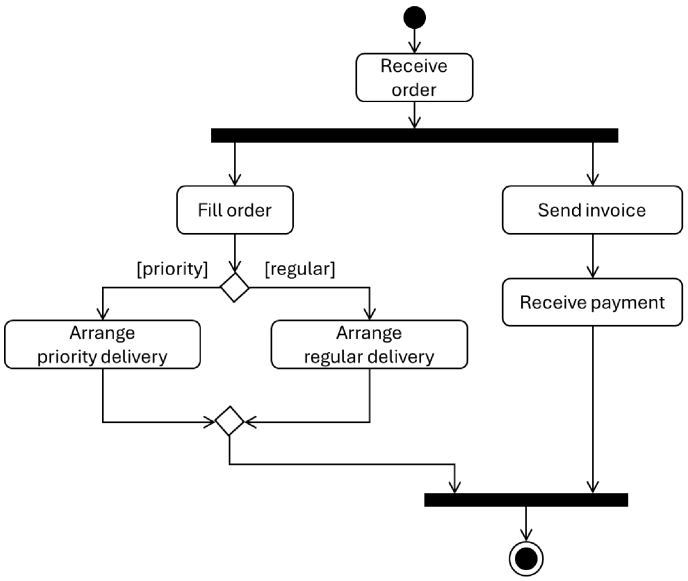

What is the MINIMUM number of test cases to exercise all scenarios defined by this diagram?

a) 2

b) 3

c) 6

d) 4

Select ONE Option.

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Question #22 (2 Points)

You are testing a payment system via an ATM. The payment can be made by debit card (D) or cash (C), and its acceptability depends on several factors, including the PIN, the amount requested, and the location of the ATM. The business rules are described in a decision table shown below:

ID	**Conditions**	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12
C1	Payment type	D	D	D	D	D	D	D	D	C	C	C	C
C2	PIN OK	Y	Y	Y	Y	N	N	N	N	n/a	n/a	n/a	n/a
C3	Requested amount OK	Y	Y	N	N	Y	Y	N	N	Y	Y	N	N
C4	Location OK	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
	Actions												
A1	Process payment	X	X							X	X		
A2	Inform bank		X		X								
A3	Inform client		X	X	X	X	X	X	X			X	X

What is the MINIMUM number of columns this decision table can have after minimization?

a) 4

b) 5

c) 6

d) 7

Select ONE Option.

Question #23 (2 Points)

Consider the following minimized decision table.

ID	**Conditions**	R1	R2	R3	R4	R5
C1	Registered customer	T	T	T	T	F
C2	Longterm customer	T	-	-	T	-
C3	Credit card expired	F	T	F	F	-
C4	Purchase amount <= 500€	T	T	T	F	-
	Actions					
A1	Credit card option offered	X		X	X	
A2	Instant transfer option offered	X	X	X		X
A3	Direct debit option offered	X	X			

Match the rules (1-4) with their characteristics (A-D).

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1. Rule R2
2. Rule R3
3. Rule R4
4. Rule R5

A. Its checksum is 1
B. Its checksum is 2 and it is consistent with the other rules
C. Its checksum is 8
D. It is inconsistent with the rule R1

a) 1D, 2A, 3C, 4B
b) 1B, 2D, 3A, 4C
c) 1B, 2C, 3A, 4D
d) 1D, 2B, 3C, 4A

Select ONE Option.

Question #24 (2 Points)

You are testing a function that searches for hotels according to a given criteria. In the input, the user selects the search area (A), and the minimum (Min) and maximum (Max) allowed price per night. The function returns a list (L) of hotels meeting the criteria.

Let A1, Min1, and Max1 be the input, and L1 be the expected output of the source test case. Let A2, Min2, and Max2 be the input, and L2 be the expected output of the follow-up test case.

Which of the following describes a correct metamorphic relation between the source test case and the follow-up test case for the search function?

a) If A1 = A2 and Max1 - Min1 > Max2 - Min2, then L2 contains all hotels from L1
b) If Min2 < Min1 and Max2 > Max1, then L2 has at least as many elements as L1
c) If A1 and A2 are disjoint, then L1 and L2 are disjoint
d) If A2 is contained in A1, then L1 contains all hotels from L2

Select ONE Option.

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Question #25 (2 Points)

A route planning system calculates the optimal route for a car trip. You test the system, using an API function that has three input parameters: starting point coordinates X, destination point coordinates Y, and optimization criterion O. Criterion O can take one of two values: S (search for the shortest route) or T (search for the route with the fastest travel time). The function returns the length of the optimal route in kilometers.
You test the correctness of the system using metamorphic testing with the following metamorphic relations:

- MR1: If the criterion changes from S to T, and X and Y remain unchanged, the calculated distance cannot decrease.
- MR2: For the criterion S, the sum of the lengths of routes from X to Y and from Y to Z cannot be lower than the length of the route from X to Z.

Suppose Rome, Pisa, and Milan are the coordinates of three points on the map. The two source test cases are as follows:

- TC1. Input: X = Rome, Y = Pisa, O = S. Output: 335 km.
- TC2. Input: X = Pisa, Y = Milan, O = S. Output: 282 km.

Which of the following follow-up test cases causes a failure by violating at least one of the metamorphic relations MR1 or MR2?

a) Input: X = Rome, Y = Rome, O = S. Output: 335 km

b) Input: X = Pisa, Y = Milan, O = T. Output: 282 km

c) Input: X = Milan, Y = Pisa, O = S. Output: 283 km

d) Input: X = Rome, Y = Milan, O = S. Output: 630 km

Select ONE Option.

Question #26 (2 Points)

You are the test analyst for a company developing a new e-commerce platform. The platform aims to revolutionize online shopping by integrating augmented reality features that allow users to try on clothing and accessories virtually. The discussion between the development team and product owners revealed several important factors that should be taken into account when testing the platform in the upcoming iteration:

- The user interface must be intuitive and responsive across various web browsers. Particular attention should be paid to the augmented reality features and their integration with the overall user experience.
- The platform must be compatible with the most popular headsets on the market.
- The core functionalities of the e-shopping platform (e.g., browsing products, shopping cart features,

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ordering process, and payment) will be implemented using the existing mechanisms from the previous platform created by the company.

You are tasked with preparing test charters for exploratory testing on this platform during the current iteration. Exploratory testers are experienced users of e-shopping platforms who knowhave a thorough understanding of the product being developed.

Which of the following test charters for an exploratory test session BEST addresses the issues from the scenario above?

a) Test charter 1: **Explore** the checkout process **With** various payment methods **To Discover** security vulnerabilities

b) Test charter 2: **Explore** the augmented reality “Product Visualization” feature **With** Firefox web browser **To Discover** user experience problems

c) Test charter 3: **Explore** the payment process **With** various devices and screen sizes **To Discover** compatibility problems regarding various headset types

d) Test charter 4: **Explore** the augmented reality “Fitting Room” feature **With** various web browsers **To Discover** usability problems

Select ONE Option.

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Question #27 (2 Points)

The e-commerce company is about to launch its new web application, and its success depends heavily on the flawless operation of its payment system. Your task is to verify that the payment system has the required level of functional correctness and usability.

The development team recently completed the payment system's core features and deployed them to a staging environment, which is a replica of the production environment but isolated for testing purposes.

The payment system is designed to handle a variety of payment methods, including credit card payments, simplified mobile payments, and direct bank transfers. The development team has already implemented a comprehensive set of synthetic test data, including dummy credit card numbers, bank accounts, and various transactions.

Which of the following is the MOST appropriate test charter for verifying the functional correctness and usability of the payment system?

a) Explore the payment system on an external network with penetration testing by simulating attacks to discover if it has any potential system vulnerabilities

b) Explore the e-commerce web application on the production server with various personas and usage scenarios to discover system-wide functional and performance issues

c) Explore the payment system on the staging server with synthetic test data to evaluate the usability of the payment procedure, the accuracy of results, and to detect areas for improvement

d) Explore the graphical user interface of the payment system with user experience design guidelines to discover the intuitiveness and aesthetics of the user interface

Select ONE Option.

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Question #28 (2 Points)

Your organization is developing an astronomy quiz app. The specification indicates that 24 astronomy questions are randomly selected from a pool and presented one by one to the player. Each question has four possible answers. One of them is correct; the others are not. When the player selects an answer, the quiz indicates whether the selection is correct or incorrect. Subsequently, the player can proceed to the next question. The quiz displays the score when the player has completed all 24 questions.

As the test analyst, you designed a checklist to guide experience-based functional system testing.

Which of the following checklist items is MOST appropriate for verifying the correct flow of user interactions?

a) When the application displays a question, are four different answers displayed and selectable?

b) For each question, does the application indicate which answer is correct and which answers are incorrect?

c) When the player selects an incorrect answer to a question, does the application mark the incorrect answer red and the correct answer (not selected) green?

d) How long does an astronomy amateur require, on average, to answer the 24 questions?

Select ONE Option.

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Question #29 (2 Points)

You are responsible for the system testing of a web-based single-player computer game. You have performed experience-based testing for previous versions of the game using a checklist. Among others, you have tested interrupting the game with the following checklist items:

ID	Description
INTERRUPT-01	Can the player interrupt the game at any time?
INTERRUPT-02	Are the user actions that interrupt the game consistent across all web pages?
INTERRUPT-03	Does the application show the same warning with the two buttons to confirm the interruption or continue the game every time it is interrupted?

The next increment focuses on the accessibility of the computer game for players with various disabilities, without changing the functionality. Which of the following checklist items should you add to your checklist to address the new features?

a) Given the interrupt warning, if the player clicks the 'Continue game' button, does the application resume the game where it was left?

b) Is the game vulnerable to security attacks when players with disabilities interrupt it on purpose or unintentionally?

c) Is the readability of the interrupt warning text and the captions of the buttons at a maximum of 5th-grade school English?

d) Are the colors of the buttons on the interrupt warning clearly distinguishable for players with red-green color deficiency?

e) Which is the highest grade of color blindness with which players can still differentiate the colors of the buttons of the interrupt warning?

Select TWO Options.

Question #30 (1 Point)

Which of the following BEST utilizes the advantages of crowd testing?

a) Designing test cases with a test analyst

b) Performing beta testing with diverse users

c) Executing the same test scripts repeatedly

d) Reviewing the GUI design with many reviewers

Select ONE Option.

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Question #31 (3 Points)

You are a test analyst on a project for a route-finding application for drivers. The project is conducted using Scrum, which combines elements from both iterative development models and incremental development models. In the current iteration of the project, three features were developed and are currently under test:

- an interactive map interface that allows users to visualize routes
- a turn-by-turn navigation instruction for guiding users along their chosen route with real-time updates on upcoming turns, exits, and maneuvers
- voice guidance providing hands-free instruction to drivers, enhancing safety and convenience during the journey

The application is being developed for smartphones and is expected to work on both iOS and Android systems. Test analysts in each iteration are responsible for system testing on the fully integrated app.

The test analysis has revealed that it may be difficult or even impossible to assess whether the route found by the algorithm is optimal. The risk analysis identified the following very high-level risk: “The application fails to work correctly on all potential configurations of mobile devices, including items such as network settings, phone type, operating system, display settings, and time and date settings.”

Considering only the information described in the above scenario, which of the following test techniques will be most useful in designing test cases for the system under test?

a) Domain analysis

b) Metamorphic testing

c) CRUD testing

d) Decision table testing

e) Pairwise testing

Select TWO Options.

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Question #32 (3 Points)

A new AI-based system is being developed. The management claims that it improves the accuracy of predictions of thunderstorms by an order of magnitude. One challenge you identified quickly is that the number of input parameters and their values is potentially very high. In addition, the AI-based system was not sufficiently specified, i.e. the test basis is incomplete and ambiguous. However, there is a proper set of test cases created by a subject matter expert who unfortunately left the project. There is pressure from management to deliver the system soon.

Which of the following test techniques should be applied in this context?

a) State-based testing

b) Metamorphic testing

c) Scenario-based testing

d) Combinatorial testing

e) CRUD testing

Select TWO Options.

Question #33 (1 Point)

Which of the following is a benefit of test design automation and why?

a) Improved defect prevention due to early modeling of test conditions

b) Effective defect detection due to repeatable, automated test scripts

c) Efficient maintenance of test scripts due to configuration management

d) Faster analysis of anomalies due to automated failure recognition

Select ONE Option.

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Question #34 (1 Point)

You are testing the following user story for an e-shop app:

As a registered customer
I want to filter for a specific category of items
So that I don't have to browse through the entire assortment of the store

Which of the following is an example of functional correctness testing for this user story?

a) Verifying that the filtering mechanism lists those categories for which the shop offers items

b) Verifying that filtering by a particular category shows items belonging to this and only this category

c) Verifying that the category tree is loaded correctly from a customer relations management system

d) Verifying that the filtering function is easy to learn and its GUI is simple and aesthetically pleasing

Select ONE Option.

Question #35 (1 Point)

An organization is developing a new in-house application designed to support all staff. The product owner engaged external user experience consultants to perform usability test sessions. Which of the following is the BEST contribution the organization's test analyst can make?

a) Selecting the participants from the user group with the most experience with the business process

b) Participating in the usability test sessions to evaluate the efficiency of working with the application

c) Helping the participants during the test sessions to enter the right data and find the right buttons

d) Describing the most likely patterns of use of the application by various personas within the organization

Select ONE Option.

Question #36 (1 Point)

Which of the following activities can a test analyst use to best contribute to the adaptability testing of a cloud-based web application?

a) Evaluating the extent to which users with disabilities can adapt to the application's usage scenarios

b) Designing tests covering the data exchange between the web client and the cloud server components

c) Analyzing operational profiles and describing the expected number of concurrent users of the application

d) Designing tests that evaluate whether the server components can be transferred to various cloud service platforms

Select ONE Option.

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Question #37 (1 Point)

Which of the following is the best example of a test analyst's contribution to interoperability testing of an online store?

a) To verify that the user can access and use the online store seamlessly on various devices and web browsers

b) To verify that the online store can integrate with third-party payment gateways and exchange payment data correctly

c) To validate that users with diverse cultural backgrounds can use the online store effectively and efficiently

d) To verify that the discount system strictly follows the specified rules and returns accurate results

Select ONE Option.

Question #38 (1 Point)

Which of the following activities is LEAST effective in defect prevention?

a) Dynamic testing

b) Risk analysis

c) Reviewing an architectural design

d) Root cause analysis

Select ONE Option.

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Question #39 (2 Points)

For a system that allocates discounts on purchases, the following two business rules apply:

- Customers with a loyalty card or whose last purchase was at least $1,000 will receive a 10% discount. Otherwise, they will receive a 5% discount if they subscribe to the newsletter.
- If a customer has not signed up for the newsletter, they will receive no discount.

The requirements are modeled using the following decision table:

Conditions	Rule 1	Rule 2	Rule 3	Rule 4
Has a loyalty card?	YES	-	NO	-
Last purchase >= $1000?	-	YES	NO	-
Subscribed to the newsletter?	-	-	YES	NO
Action				
Discount	10%	10%	5%	0%

What problem (if any) with the requirements can you discover by analyzing this decision table?

a) Inconsistency – there is at least one feasible combination of conditions for which the specification describes two contradicting actions

b) Incompleteness – there is at least one feasible combination of conditions for which the specification predicts no behavior at all

c) Overlapping rules – there are at least two action-equivalent columns that match the same combination of conditions

d) There is no problem – the decision table models the requirements correctly, and there are no anomalies in the requirements

Select ONE Option.

Question #40 (2 Points)

You are reviewing the requirements specification of a beverage vending machine. You are focusing on the coin controller that collects, validates, and counts the inserted coins. You notice the following requirements related to the behavior of the coin controller:

- Req201: For each ordering transaction, the coin controller distinguishes the situations among modes empty, partially inserted, and sufficient to identify whether the user has paid enough to start the beverage delivery
- Req215: If the user has paid enough, the controller shall immediately return any further inserted coins.
- Req235: The coin controller shall validate the inserted coins and immediately return invalid coins with an appropriate error message.

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- Req236: The coin controller changes its mode to sufficient as soon as the user inserts enough coins.
- Req237: The user shall be able to cancel the transaction before beverage delivery and get the inserted coins returned. The coin controller will be empty after cancel is selected.
- Req243: The coin controller shall display an appropriate message when the user has inserted enough coins for payment and sum up any further coins inserted.
- Req253: When the user inserts a coin with which the required amount is not reached, the coin controller shall remain in the partially inserted mode and add the value of the inserted coin to the intermediate value paid.
- Req267: If the coin controller is in sufficient mode and the user triggers the delivery, it shall deliver the beverage to the user.

You decided to model the behavior of the coin controller with a state machine diagram. Which of the following anomalies will be MOST LIKELY detected by the modeling?

a) It is not clear which event will trigger the coin controller to switch from the partially inserted mode to the sufficient mode

b) The specification is ambiguous when the coin controller is in the partially inserted mode. The same event triggers returning the coins and delivering the beverage

c) The specification is incomplete because there is no event defined for returning an invalid coin

d) The specification is ambiguous in the sufficient mode. The same event is supposed to trigger two competing outcomes, i.e., summing up the coins and immediately returning the coins

Select ONE Option.

Question #41 (2 Points)

A company has developed an online shopping website. This year, to better serve new customers, the company decided to develop a new feature to guide new customers using the website. The requirements engineering team developed the following requirements for this new feature:

Use case: Familiarize the customer with the online shopping website and purchasing

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Customer	System
1. The user visits the website.	2. The system shows a promotion banner prompting customers to access the new customer guide.
3. The user clicks on the prompt.	4. The system opens the guide.
5. The user navigates through the guide's introductory section, learning about the website's features and layout.	
6. The user follows the guide's instructions to make a successful purchase.	7. The system shows the successful completion of the purchase.
8. The user closes the prompt.	9. The system closes the guide.

You are the test analyst for this product, and you review the above use case using a scenario-based reviewing technique.

Which of the following defects submitted during your review is a false-positive result?

a) The system should offer experienced users an option to dismiss the guide permanently

b) In step 4: Once the user has responded to the promotion, the system should hide the promotion banner

c) The system should provide an option for the user to reopen the guide whenever they are interested

d) After step 5, the system should automatically close the guide, assuming that it is no longer needed

Select ONE Option.

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Question #42 (2 Points)

Match the review technique descriptions (1-4) with the correct technique names (A-D).

Descriptions:

1. Reviewers simulate processes using use cases or activity diagrams and may explore beyond documented scenarios.
2. Reviewers use fictional personas (e.g., administrators or end users) to focus on specific user roles.
3. Unstructured reviewing with no guidance, risking duplicate defect reports.
4. Uses predefined checklists to guide reviewers but encourages exploration beyond listed items.

Techniques:

A. Ad hoc reviewing
B. Checklist-based reviewing
C. Scenario-based reviewing
D. Role-based reviewing

a) 1-C, 2-D, 3-B, 4-A
b) 1-D, 2-C, 3-A, 4-B
c) 1-C, 2-D, 3-A, 4-B
d) 1-A, 2-B, 3-C, 4-D

Select ONE Option.

Question #43 (3 Points)

You work as a test analyst in a project that follows an incremental development model. Each increment consists of four sequential phases: requirements, design, implementation, and testing. Each phase ends with an appropriate test activity, and each increment ends with a release to the customer. After the last increment, the client did not raise any defects during the operation. You collect data on the number of defects introduced and detected in different phases of the last increment. The results are presented in the table below.

For example, the requirements phase introduced 80 defects, and implementation detected 40 of them; static analysis and component testing detected 140 defects in total.

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		phase of defect detection and related test activity					total number of introduced defects
		requirements modeling and review	**design** modeling and review	**implementation** static analysis and component testing	**testing** system and acceptance testing	**operation** (after release)	
phase of defect introduction	**requirements**	10	10	40	20	0	80
	design		10	90	30	0	130
	implementation			10	90	0	100
	testing				0	0	0
total number of detected defects		10	20	140	140	0	

Your management wants to improve defect detection, but due to limited resources, they asked you to select only one phase for which you should carry out the improvement actions. You base your choice on calculating defect detection percentage as the test effectiveness measure for each phase.

Which phase and test activity should you select for the improvement actions?

a) Requirements – modeling and review

b) Design – modeling and review

c) Implementation – static analysis and component testing

d) Testing – system testing and acceptance testing

Select ONE Option.

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Question #44 (3 Points)

A home security system architecture comprises four components: a control panel, a user interface, a cloud-based backend system, and an event processing engine.

In similar projects within your organization, a strong correlation was observed between the size of the components and the number of defects found in component testing. On average, one defect was found per 50 lines of code. You use this model to predict the number of defects in each component.

The test results for the individual system components, containing the actual number of defects, are as follows:

Component	Lines of code	Defects found
Control panel	600	14
User interface	2000	45
Backend system	400	17
Event processing engine	500	8

You use defect cluster analysis to identify defect-prone areas. Which component, when tested more rigorously, will probably reveal more defects?

a) Control panel

b) User interface

c) Backend system

d) Event processing engine

Select ONE Option.

Question #45 (1 Point)

How does defect classification support root cause analysis (RCA)?

a) It allows RCA to be carried out early, before static testing and dynamic testing, because RCA may be based on abstract categories of defects rather than on specific individual defects

b) It allows RCA to be combined with test techniques because defect classification uses the same software development lifecycle models as test techniques

c) It makes RCA more efficient because the analysis focuses not on individual defects but on groups of defects with similar characteristics

d) It makes RCA more effective because defect classification allows for a deeper analysis of defects and the discovery of more root causes

Select ONE Option.

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Appendix A – Additional Questions

Question #A1 (1 Point)

The tasks of the TA in test analysis include:

A) Define test conditions for each test item

B) Involve stakeholders in reviewing the test conditions

C) Review the test basis for testability

D) Check that test objectives and test approach are clear

Order the tasks A to D in correct chronological sequence:

Activity 1	Activity 2	Activity 3	Activity 4

Question #A2 (1 Point)

Which of the following is typically the responsibility of the test analyst during the execution of an automated regression test suite?

a) Manually rerun the test cases that have failed during automated test execution

b) Fix the automated test scripts that caused anomalies in the test execution

c) Report a defect for each anomaly that occurs during test execution

d) Compare actual results with expected results to determine the test result

Select ONE Option.

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Question #A3 (1 Point)

Consider the following test case:

Test case: TC 02.001 - correct calculation of order price with discount
Preconditions: the user is logged in
Inputs: the shopping cart contains products for the amount entitled to the discount
Actions: the user proceeds to payment
Expected results: the total price displayed is reduced by the discount amount entitled

How can this test case be classified in terms of level of abstraction?

a) This is a high-level test case because it covers a business requirement rather than a technical specification.

b) This is a high-level test case because it does not contain specific test data.

c) This is a low-level test case because the action is an individual step of a business process.

d) This is a low-level test case because it can be the basis for creating test scripts that implement this test case with various inputs.

Select ONE Option.

Question #A4 (1 Point)

Which of the following describes a valid test case quality criterion and has valid justification?

a) Test cases covering important features in the product backlog but not yet included in the current version of the test object should be defined to support future maintenance.

b) The test cases should contain the concrete values of the test data required for preconditions, inputs, and outputs to enable test execution.

c) If the test basis uses a glossary of functional terms, the test cases should also use that terminology to make them consistent and understandable.

d) Test cases based on end-to-end scenarios should be limited to a few steps of the scenarios to ease their combination into test procedures and an analysis of the cause of failures.

Select ONE Option.

Question #A5 (2 Points)

In the item management system IMS1, each item can have multiple versions. The latest version is active, all older versions are historical and frozen.

You are specifying domain-layer keywords for the following high-level test case:

- Preconditions: An item has multiple versions; the latest version is active; the others are old and frozen.

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Step	Action/Input	Expected result
1	The user selects the item with multiple versions	IMS1 shows the details of the latest version in edit mode
2	The user selects an older version of the item	IMS1 shows the details of that version in view-only mode

You have specified the following keywords:

1. Search the database for an item with multiple versions (Item-ID)
2. Select item (Item-ID)
3. Select item version (Number)
4. Assert details displayed are correct (Screen, Item-ID, Number)
5. Assert details are editable (Screen)
6. Assert details are non-editable (Screen)

You want to use keywords in one of the following groups of elements of the high-level test cases:

A) Precondition only
B) Step 1 only
C) Step 2 only
D) Both step 1 and step 2

Assign each specified keyword (1-6) to ONE group of test case elements (A-D) while not leaving any group empty.

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Question #A6 (2 Points)

Standard letters carried by a postage service have a maximum length of 235mm and a maximum weight of 20g. You are testing an automatic letter scanning system that can measure with a precision of 1 mm and 1g respectively.

You perform domain testing for valid standard letter sizes with the following inputs:

No.	Length in mm	Weight in g
X1	160	15
X2	200	25
X3	230	21
X4	235	20
X5	250	16
X6	236	18

Inputs can have of one of the coverage item types:

1. ON point for both length and weight
2. IN point for both length and weight
3. OFF point for length only
4. OFF point for weight only
5. OUT point for length only
6. OUT point for weight only

Assign each input (X1-X6) to EXACTLY ONE coverage item type (1-6).

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Question #A7 (2 Points)

The specification of a safety-critical component states about the integer values of an input parameter the following:

- Values less than 10 shall be rejected;
- Values between 10 and 21 shall be accepted;
- Values greater than or equal to 22 shall be rejected.

Which of the following input data sets provides 100% reliable domain coverage while using a MINIMAL number of values?

a) 9, 10, 21, 22

b) 0, 9, 10, 21, 22, 50

c) 9, 10, 11, 20, 21, 22

d) 8, 9, 10, 11, 20, 21, 22, 23

Select ONE Option.

Question #A8 (2 Points)

An airline has specific restrictions regarding checked baggage:

- The total dimensions (length + width + height) D of a piece of baggage must be at least 80 cm and cannot exceed 158 cm.
- The weight W must not exceed 23 kg.
- Measurements in centimeters and kilograms are always rounded up to the nearest whole number.

What is the MINIMUM set of pairs (D,W) of dimension and weight to achieve 100% simplified domain coverage?

a) (80,10), (79,10), (125,23), (125,24), (158,20), (159,20)

b) (80,23), (79,24), (158,23), (159,24)

c) (80,23), (79,23), (80,24), (158,23), (158,24), (159,23)

d) (80,23), (79,23), (80,24), (158,20), (159,20)

Select ONE Option.

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