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**Caltech** Center for Technology & Management Education

## AI and Machine Learning Bootcamp



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### ISTQB CT-AI Exam Syllabus Topics:

Topic	Details
Topic 1	<ul style="list-style-type: none"> <li>Testing AI-Specific Quality Characteristics: In this section, the topics covered are about the challenges in testing created by the self-learning of AI-based systems.</li> </ul>
Topic 2	<ul style="list-style-type: none"> <li>ML: Data: This section of the exam covers explaining the activities and challenges related to data preparation. It also covers how to test datasets create an ML model and recognize how poor data quality can cause problems with the resultant ML model.</li> </ul>
Topic 3	<ul style="list-style-type: none"> <li>ML Functional Performance Metrics: In this section, the topics covered include how to calculate the ML functional performance metrics from a given set of confusion matrices.</li> </ul>
Topic 4	<ul style="list-style-type: none"> <li>Quality Characteristics for AI-Based Systems: This section covers topics covered how to explain the importance of flexibility and adaptability as characteristics of AI-based systems and describes the vitality of managing evolution for AI-based systems. It also covers how to recall the characteristics that make it difficult to use AI-based systems in safety-related applications.</li> </ul>
Topic 5	<ul style="list-style-type: none"> <li>Using AI for Testing: In this section, the exam topics cover categorizing the AI technologies used in software testing.</li> </ul>
Topic 6	<ul style="list-style-type: none"> <li>systems from those required for conventional systems.</li> </ul>
Topic 7	<ul style="list-style-type: none"> <li>Machine Learning ML: This section includes the classification and regression as part of supervised learning, explaining the factors involved in the selection of ML algorithms, and demonstrating underfitting and overfitting.</li> </ul>
Topic 8	<ul style="list-style-type: none"> <li>Test Environments for AI-Based Systems: This section is about factors that differentiate the test environments for AI-based</li> </ul>

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## 2026 ISTQB High Hit-Rate CT-AI: Certified Tester AI Testing Exam Online Bootcamps

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### ISTQB Certified Tester AI Testing Exam Sample Questions (Q37-Q42):

#### NEW QUESTION # 37

Which of the following statements regarding experience-based testing for AI-based systems is correct?

Choose ONE option (1 out of 4)

- A. Intuitive test case design for AI-based systems involves interactive, hypothesis-driven examination of data for correlations or developmental trends.
- B. Tour refers to intuitive test case design for AI-based systems based on multiple, sequential test cases using systematically biased training data.
- C. Exploratory testing is often used for AI-based systems because there are often insufficient specifications or problems with the test oracle for AI-based systems.
- D. In checklist-based testing of AI-based systems, the existing test cases are dynamically adapted, for example based on metamorphic testing.

**Answer: C**

Explanation:

The ISTQB CT-AI syllabus explains in Section 4.4 - Experience-Based Testing for AI Systems that AI-based systems frequently

suffer from insufficient specifications, unpredictable model behavior, and test oracle problems, especially when outputs depend on probabilistic or learned patterns. The syllabus explicitly states that exploratory testing is especially valuable in such contexts because it allows testers to investigate the system interactively, observe unexpected behavior, and evaluate system responses that cannot be fully predicted beforehand. Thus, Option C accurately reflects the role and justification of exploratory testing for AI systems. Option A describes data analysis rather than intuitive test design. Option B is incorrect because checklist-based testing does not dynamically adapt test cases; instead, it follows predetermined checklists. Option D incorrectly defines "tour-based testing"; tours refer to structured exploratory approaches, not biased datasets. Therefore, Option C is the syllabus-aligned correct statement.

### NEW QUESTION # 38

Pairwise testing can be used in the context of self-driving cars for controlling an explosion in the number of combinations of parameters.

Which ONE of the following options is LEAST likely to be a reason for this incredible growth of parameters?

SELECT ONE OPTION

- A. Different Road Types
- B. Different weather conditions
- C. **ML model metrics to evaluate the functional performance**
- D. Different features like ADAS, Lane Change Assistance etc.

**Answer: C**

Explanation:

Pairwise testing is used to handle the large number of combinations of parameters that can arise in complex systems like self-driving cars. The question asks which of the given options is least likely to be a reason for the explosion in the number of parameters.

\* Different Road Types (A): Self-driving cars must operate on various road types, such as highways, city streets, rural roads, etc. Each road type can have different characteristics, requiring the car's system to adapt and handle different scenarios. Thus, this is a significant factor contributing to the growth of parameters.

\* Different Weather Conditions (B): Weather conditions such as rain, snow, fog, and bright sunlight significantly affect the performance of self-driving cars. The car's sensors and algorithms must adapt to these varying conditions, which adds to the number of parameters that need to be considered.

\* ML Model Metrics to Evaluate Functional Performance (C): While evaluating machine learning (ML) model performance is crucial, it does not directly contribute to the explosion of parameter combinations in the same way that road types, weather conditions, and car features do. Metrics are used to measure and assess performance but are not themselves variable conditions that the system must handle.

\* Different Features like ADAS, Lane Change Assistance, etc. (D): Advanced Driver Assistance Systems (ADAS) and other features add complexity to self-driving cars. Each feature can have multiple settings and operational modes, contributing to the overall number of parameters.

Hence, the least likely reason for the incredible growth in the number of parameters is C. ML model metrics to evaluate the functional performance.

References:

\* ISTQB CT-AI Syllabus Section 9.2 on Pairwise Testing discusses the application of this technique to manage the combinations of different variables in AI-based systems, including those used in self-driving cars.

\* Sample Exam Questions document, Question #29 provides context for the explosion in parameter combinations in self-driving cars and highlights the use of pairwise testing as a method to manage this complexity.

### NEW QUESTION # 39

A company producing consumable goods wants to identify groups of people with similar tastes for the purpose of targeting different products for each group. You have to choose and apply an appropriate ML type for this problem.

Which ONE of the following options represents the BEST possible solution for this above-mentioned task?

SELECT ONE OPTION

- A. **Clustering**
- B. Association
- C. Classification
- D. Regression

**Answer: A**

Explanation:

A . Regression

Regression is used to predict a continuous value and is not suitable for grouping people based on similar tastes.

B . Association

Association is used to find relationships between variables in large datasets, often in the form of rules (e.g., market basket analysis).

It does not directly group individuals but identifies patterns of co-occurrence.

C . Clustering

Clustering is an unsupervised learning method used to group similar data points based on their features. It is ideal for identifying groups of people with similar tastes without prior knowledge of the group labels. This technique will help the company segment its customer base effectively.

D . Classification

Classification is a supervised learning method used to categorize data points into predefined classes. It requires labeled data for training, which is not the case here as we want to identify groups without predefined labels.

Therefore, the correct answer is C because clustering is the most suitable method for grouping people with similar tastes for targeted product marketing.

#### NEW QUESTION # 40

A system is to be developed to detect lung cancer using X-ray images.

Which statement BEST describes the difference between a conventional system and an AI system with supervised machine learning?

Choose ONE option (1 out of 4)

- A. The implementation of an AI system consists mainly of training data, whereas that of a conventional system consists of branches and loops.
- B. The X-ray images that an AI system can analyze must be structurally different from X-ray images used in a conventional system.
- C. The results of analyzing an X-ray for lung cancer using an AI system are more understandable than with a conventional system.
- D. An AI system independently determines patterns in X-rays during training; a conventional system requires a human to program in those patterns.

#### Answer: D

Explanation:

The syllabus explains the fundamental distinction between conventional systems and AI-based systems using supervised machine learning in Section 1.3 - AI-Based and Conventional Systems. A conventional system relies on human-programmed logic such as branches, conditions, and explicit rules to interpret input data.

The system behaves exactly as specified by its developers.

In contrast, AI systems using supervised learning automatically learn patterns from labeled data. The syllabus states that "patterns in data are used by the system to determine how it should react in the future..."

The AI determines on its own what patterns or features in the data can be used". This aligns directly with Option C: an AI system identifies relevant diagnostic patterns in X-ray images during training, whereas a conventional system requires human experts to explicitly program those patterns.

Option A is incorrect because AI outputs are typically less explainable, not more. Option B is incorrect because both systems can use the same X-ray images; ML does not require structurally different images. Option D is oversimplified and not fully accurate; while training data is central to ML, AI systems also include architecture, algorithms, and preprocessing—not just data.

Thus, Option C is the correct and syllabus-aligned answer.

#### NEW QUESTION # 41

Which ONE of the following characteristics is the least likely to cause safety related issues for an AI system?

SELECT ONE OPTION

- A. High complexity
- B. Non-determinism
- C. Self-learning
- D. Robustness

#### Answer: D

Explanation:

The question asks which characteristic is least likely to cause safety-related issues for an AI system. Let's evaluate each option:  
Non-determinism (A): Non-deterministic systems can produce different outcomes even with the same inputs, which can lead to unpredictable behavior and potential safety issues.

**Robustness (B):** Robustness refers to the ability of the system to handle errors, anomalies, and unexpected inputs gracefully. A robust system is less likely to cause safety issues because it can maintain functionality under varied conditions.

High complexity (C): High complexity in AI systems can lead to difficulties in understanding, predicting, and managing the system's behavior, which can cause safety-related issues.

**Self-learning (D):** Self-learning systems adapt based on new data, which can lead to unexpected changes in behavior. If not properly monitored and controlled, this can result in safety issues.

## Reference:

ISTQB CT-AI Syllabus Section 2.8 on Safety and AI discusses various factors affecting the safety of AI systems, emphasizing the importance of robustness in maintaining safe operation.

## NEW QUESTION # 42

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