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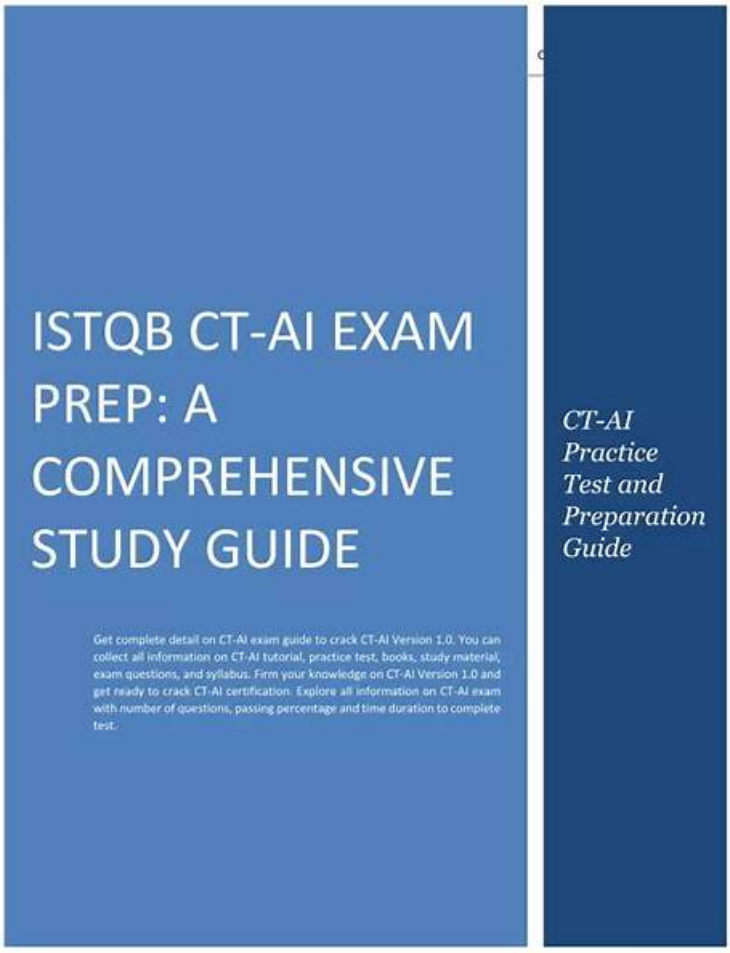

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ISTQB CT-AI Exam Syllabus Topics:

Topic	Details
Topic 1	• Neural Networks and Testing: This section of the exam covers defining the structure and function of a neural network including a DNN and the different coverage measures for neural networks.
Topic 2	• 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.
Topic 3	• Using AI for Testing: In this section, the exam topics cover categorizing the AI technologies used in software testing.
Topic 4	• Methods and Techniques for the Testing of AI-Based Systems: In this section, the focus is on explaining how the testing of ML systems can help prevent adversarial attacks and data poisoning.

Topic 5	• 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.
Topic 6	• Test Environments for AI-Based Systems: This section is about factors that differentiate the test environments for AI-based
Topic 7	• systems from those required for conventional systems.
Topic 8	• 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.
Topic 9	• 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.
Topic 10	• Testing AI-Based Systems Overview: In this section, focus is given to how system specifications for AI-based systems can create challenges in testing and explain automation bias and how this affects testing.
Topic 11	• Introduction to AI: This exam section covers topics such as the AI effect and how it influences the definition of AI. It covers how to distinguish between narrow AI, general AI, and super AI; moreover, the topics covered include describing how standards apply to AI-based systems.

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ISTQB Certified Tester AI Testing Exam Sample Questions (Q91-Q96):

NEW QUESTION # 91
"AllerEgo" is a product that uses sell-learning to predict the behavior of a pilot under combat situation for a variety of terrains and enemy aircraft formations. Post training the model was exposed to the real- world data and the model was found to be behaving poorly. A lot of data quality tests had been performed on the data to bring it into a shape fit for training and testing.
Which ONE of the following options is least likely to describes the possible reason for the fall in the performance, especially when considering the self-learning nature of the Al system?
SELECT ONE OPTION

- A. The unknown nature and insufficient specification of the operating environment might have caused the poor performance.
- B. The fast pace of change did not allow sufficient time for testing.
- C. The difficulty of defining criteria for improvement before the model can be accepted.
- D. There was an algorithmic bias in the Al system.

Answer: B

Explanation:
* A. The difficulty of defining criteria for improvement before the model can be accepted.
* Defining criteria for improvement is a challenge in the acceptance of AI models, but it is not directly related to the performance

drop in real-world scenarios. It relates more to the evaluation and deployment phase rather than affecting the model's real-time performance post-deployment.
* B. The fast pace of change did not allow sufficient time for testing.
* This can significantly affect the model's performance. If the system is self-learning, it needs to adapt quickly, and insufficient testing time can lead to incomplete learning and poor performance.
* C. The unknown nature and insufficient specification of the operating environment might have caused the poor performance.
* This is highly likely to affect performance. Self-learning AI systems require detailed specifications of the operating environment to adapt and learn effectively. If the environment is insufficiently specified, the model may fail to perform accurately in real-world scenarios.
* D. There was an algorithmic bias in the AI system.
* Algorithmic bias can significantly impact the performance of AI systems. If the model has biases, it will not perform well across different scenarios and data distributions.
Given the context of the self-learning nature and the need for real-time adaptability, optionAis least likely to describe the fall in performance because it deals with acceptance criteria rather than real-time performance issues.

NEW QUESTION # 92
Which of the following statements about ML functional performance metrics is correct?
Choose ONE option (1 out of 4)

- A. The receiver operating characteristic curve shows, depending on parameters, how well the model distinguishes between different clusters.
- B. Metrics used to measure clustering include intra-cluster metrics that measure the proximity of a cluster's data points.
- C. The R-squared metric indicates how well the model distinguishes between different classes based on the ROC curve.
- D. The silhouette coefficient describes how well the regression model fits the dependent variables.

Answer: B

Explanation:
The ISTQB CT-AI syllabus explains ML performance metrics in Section3.2 - Evaluating ML Models. For clustering, which is an unsupervised learning method, the syllabus lists metrics such asintra-cluster distance, inter-cluster distance, and coherence measures. Intra-cluster metrics evaluate how close data points are within a cluster, which directly corresponds to Option A.
Option B is incorrect becauseR-squaredis a regression metric measuring goodness-of-fit, not classification performance, and has no connection to ROC curves. Option C is wrong because thesilhouette coefficientis also a clustering metric, measuring cohesion vs. separation-not regression accuracy. Option D is incorrect because ROC curves evaluatebinary or multiclass classification, not clustering.
Thus, OptionAis the only accurate statement based on the syllabus.

NEW QUESTION # 93
Which of the following is correct regarding the layers of a deep neural network?

- A. There is at least one internal hidden layer
- B. The output layer is not connected with the other layers to maintain integrity
- C. There must be a minimum of five total layers to be considered deep
- D. There is only an input and output layer

Answer: A

Explanation:
The syllabus clearly explains the structure of a deep neural network (DNN):
"A deep neural network comprises three types of layers. The input layer receives inputs... Between the input and output layers are hidden layers made up of artificial neurons, which are also known as nodes." (Reference: ISTQB CT-AI Syllabus v1.0, Section 6.1, page 45 of 99)

NEW QUESTION # 94
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. ML model metrics to evaluate the functional performance
- C. Different weather conditions
- D. Different features like ADAS, Lane Change Assistance etc.

Answer: B

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 isleast likelyto 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, theleast likelyreason for the incredible growth in the number of parameters isC. 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 # 95
Which ONE of the following options describes a scenario of A/B testing the LEAST?
SELECT ONE OPTION

- A. A comparison of the performance of two different ML implementations on the same input data.
- B. A comparison of two different offers in a recommendation system to decide on the more effective offer for same users.
- C. A comparison of the performance of an ML system on two different input datasets.
- D. A comparison of two different websites for the same company to observe from a user acceptance perspective.

Answer: C

Explanation:
A/B testing, also known as split testing, is a method used to compare two versions of a product or system to determine which one performs better. It is widely used in web development, marketing, and machine learning to optimize user experiences and model performance. Here's why option C is the least descriptive of an A/B testing scenario:
* Understanding A/B Testing:
* In A/B testing, two versions (A and B) of a system or feature are tested against each other. The objective is to measure which version performs better based on predefined metrics such as user engagement, conversion rates, or other performance indicators.
* Application in Machine Learning:
* In ML systems, A/B testing might involve comparing two different models, algorithms, or system configurations on the same set of data to observe which yields better results.
* Why Option C is the Least Descriptive:
* Option C describes comparing the performance of an ML system on two different input datasets.
This scenario focuses on the input data variation rather than the comparison of system versions or features, which is the essence of A/B testing. A/B testing typically involves a controlled experiment with two versions being tested under the same conditions, not different datasets.
* Clarifying the Other Options:

* A. A comparison of two different websites for the same company to observe from a user acceptance perspective: This is a classic example of A/B testing where two versions of a website are compared.
* B. A comparison of two different offers in a recommendation system to decide on the more effective offer for the same users: This is another example of A/B testing in a recommendation system.
* D. A comparison of the performance of two different ML implementations on the same input data: This fits the A/B testing model where two implementations are compared under the same conditions.
References:
* ISTQB CT-AI Syllabus, Section 9.4, A/B Testing, explains the methodology and application of A/B testing in various contexts.
* "Understanding A/B Testing" (ISTQB CT-AI Syllabus).

NEW QUESTION # 96
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