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Question 1

Question Type: MultipleChoice

Choose the correct answer:

Which statement defines Alf Input text?

Options:

A- It is a concrete representation tor UML model elements in fUML.

B- It is a language used with OCL for writing sound and valid constraints.

C- It is a representation of UML model elements in a programming language.

D- It is usually used to enhance the expressiveness of UML profile stereotypes.

Answer:

A

Explanation:

Alf (Action Language for Foundational UML) is essentially a textual notation for UML behaviors that can be attached to a UML model in any place where a UML behavior can be specified. Alf Input text serves as a concrete representation for UML model elements within the fUML, allowing for behavioral modeling using a textual surface notation.This facilitates a model-driven process capable of generating fully executable source code, thus integrating structural modeling with behavioral modeling12.Alf allows for detailed behavioral specification in a textual form as opposed to the more cumbersome graphical activity diagram notation, making it a practical tool for specifying the operational behavior of a system within the UML framework2.

Question 2

Question Type: MultipleChoice

Choose the correct answer:

Which concept is used in AN to represent a model element such as a class or an activity?

Options:

A- Unit

B- Package

C- Classifier

D- Namespace

Answer:

C

Explanation:

In UML, the concept used to represent a model element such as a class or an activity is known as a Classifier.A Classifier in UML is a term that categorizes a group of model elements that have similar structural features, which include attributes and associations, and similar behavioral features, which include operations and methods1.The term applies not only to specific UML model elements but to all classifiers, encompassing a variety of elements such as classes, components, interfaces, and even activities1.

For instance, a class is a classifier because it describes a set of objects with similar properties (attributes), common behavior (operations), common relationships to other objects, and common semantics.An activity, which is a behavior, can also be considered a classifier because it describes a sequence of actions or flow of control and data1. Therefore, the correct answer is C. Classifier, as it is the overarching concept that includes both structural and behavioral elements within UML.

Question 3

Question Type: MultipleChoice

Choose the correct answer:

Which input element does lexical analysis of Action Language for Foundational UML text discard?

Options:

A- term

B- delimiters

C- expression

D- whitespace

Answer:

D

Explanation:

During the lexical analysis of Action Language for Foundational UML (fUML) text, whitespace (such as spaces, tabs, and line breaks) is discarded.The lexical analysis focuses on identifying meaningful tokens (such as keywords, identifiers, and operators) while ignoring whitespace, which does not contribute to the semantics of the language2.

Question 4

Question Type: MultipleChoice

Choose the correct answer:

Which statement is correct about the compiled model resulting from Alt text?

Options:

A- It does not have to be conformant to the fUML subset.

B- It must to be the same as a model resulting from the mapping to fUML

C- It can be executed by any UML tool, even those are not fUML-conformant.

D- It must have the equivalent effect as a model resulting from the mapping to fUML

Answer:

D

Explanation:

The compiled model resulting from the Action Language for Foundational UML (fUML) must have the equivalent effect as a model resulting from the mapping to fUML.In other words, the compiled model should behave in the same way as if it were directly executed using the fUML execution semantics

Question 5

Question Type: MultipleChoice

Choose the correct answer:

How are the execution semantics of Alf defined?

Options:

A- by a specification defined with the Meta Object Facility

B- by a specification defined with the Object Constraint Language

C- by a specification defined with the programming language Java

D- by mapping the concrete syntax of Alf to the abstract syntax of fUML

Answer:

D

Explanation:

The execution semantics of Alf (Action Language for Foundational UML) are defined by mapping the concrete syntax of Alf to the abstract syntax of fUML3.Alf provides a textual surface representation for a subset of UML model elements, and its main benefit is an execution semantics that allows for the generation of executable code out of Alf specifications4. This mapping ensures that Alf can be used to specify behavior in a way that is directly executable in the context of an fUML model.

Question 6

Question Type: MultipleChoice

Choose the correct answer:

In fUML. how must an execution model be modeled?

Options:

A- as a State

B- as an Action

C- as an Activity

D- as a Collaboration

Answer:

C

Explanation:

In fUML (Foundational UML), an execution model must be modeled as an Activity.fUML is a subset of UML that includes the ability to model behavior using UML activities, which are composed of a rich set of primitive actions1.Activities in fUML represent the executable aspects of a model and define the flow of control and data2. They are the primary means for specifying the detailed procedural logic of the behavior of a system within fUML.

Question 7

Question Type: **MultipleChoice**

Choose Ihe correct answer:

Which statement is true about fUML?

Options:

A- All constructs of fUML are executable

B- The semantics of Interactions are expressed in fUML

C- fUML is designed primarily to express static semantics.

D- fUML includes constructs widely used in both UML models and platform languages.

Answer:

A

Explanation:

fUML (Foundational UML) is a subset of the standard Unified Modeling Language (UML) that includes standard, precise execution semantics. This subset encompasses typical structural modeling constructs of UML such as classes, associations, data types, and enumerations, as well as the ability to model behavior using UML activities composed from a set of primitive actions.Therefore, a model constructed in fUML is executable in the same sense as a program in a traditional programming language, but with the level of abstraction and richness of expression of a modeling language2.

Question 8

Question Type: MultipleChoice

Choose the correct answer: What is the scope of fUML?

Options:

A- It defines the implementation of the action metamodel defined in UML 1.5.

B- It defines execution semantics for UML activity diagrams, state machines, and sequence diagrams

C- It defines a subset of behavioral concepts to ensure computational independence of control and data structures.

D- It defines execution semantics for a set of high-level UML modeling concepts used by a wide range of system types.

Answer:

D

Explanation:

The scope of fUML (Foundational UML) is to define execution semantics for a subset of the UML 2 metamodel that provides a shared foundation for higher-level UML modeling concepts.This includes the precise definition of the execution semantics of that subset, which is intended to be used by a wide range of system types, including physically distributed and concurrent systems without assumptions

about global synchronization1.

Question 9

Question Type: MultipleChoice

Choose the correct answer:

What is a reason for fUML lo be compact?

Options:

A- fUML should be small to facilitate definition of a clear semantics.

B- fUML must be possible to execute on computers with restricted capacity

C- fUML must be easily memorized by those who apply it to make semantics.

D- fUML should always support 1-1 mappings from surface to platform languages.

Answer:

A

Explanation:

The reason for fUML to be compact is to facilitate the definition of clear semantics. A smaller, more focused subset of UML allows for a more precise and unambiguous specification of the execution semantics.This clarity is essential for ensuring that models are executed consistently and as intended across different tools and platforms2. The compact nature of fUML helps in achieving this goal by limiting the scope to the essential elements necessary for execution, thereby reducing complexity and potential for misinterpretation.

Question 10

Question Type: MultipleChoice

Choose the correct answer:

What does "computationally complete" mean in the context of fUML?

Options:

A- It characterizes a model that covers all aspects of the real system and can be used for simulation purposes.

B- It characterizes a model that enables a modeling tool to execute all behavioral diagrams of the UML.

C- It characterizes a subset of UML that is sufficiently expressive to allow definition of models that can be automatically executed on a computer by an execution tool.

D- It characterizes a model that is compliant to the third conformance level of UML (level 1 = informal, level 2 = semi-formal).

Answer:

C

Explanation:

The term "computationally complete" in the context of fUML refers to a subset of UML that is expressive enough to define models that can be executed automatically by a computer using an execution tool.This means that the subset includes all the necessary elements and constructs to specify the behavior of a system in a way that can be understood and run by a machine without further interpretation

Question 11

Question Type: MultipleChoice

Choose the correct answer:

What is correct about the modeling of individual things with UML?

Options:

A- A UML Model can contain individual things (e.g. Instances) UML does not prescribe the level of detail to be used in the description.

B- A UML Model can contain statements about individual things If a thing is an instance of a Classifier, these statements must be consistent (all mandatory Properties must be defined, all Constraints must be satisfied).

C- A UML Model can contain statements about individual things These statements can be incomplete, imprecise, and abstract, but not wrong.

D- A UML Model can contain statements about individual things. These statements can be incomplete, imprecise, abstract, may turn out to be wrong, or even be asserted as counterfactual

E- A UML Model can only contain statements about sets of individual things (e.g. Classifiers).

Answer:

D

Explanation:

In UML, modeling individual things (such as instances) involves making statements about them. Here are the details for each option:

A . A UML Model can contain individual things (e.g. Instances) UML does not prescribe the level of detail to be used in the description.

This statement is partially correct. UML models can indeed contain individual things (instances), but the level of detail is not explicitly prescribed by UML. However, the statement does not cover the possibility of incomplete or imprecise information.

B . A UML Model can contain statements about individual things If a thing is an instance of a Classifier, these statements must be consistent (all mandatory Properties must be defined, all Constraints must be satisfied).

While it is true that a UML model can contain statements about individual things (instances), the requirement for consistency (mandatory properties and constraints) is not explicitly mentioned in UML. Therefore, this option is not entirely accurate.

C . A UML Model can contain statements about individual things These statements can be incomplete, imprecise, and abstract, but not wrong.

This statement is also partially correct. UML allows for incomplete, imprecise, and abstract statements about individual things. However, it does not guarantee that these statements cannot be wrong.

D . A UML Model can contain statements about individual things. These statements can be incomplete, imprecise, abstract, may turn out to be wrong, or even be asserted as counterfactual.

This option provides a more accurate representation. UML allows for statements about individual things that can be incomplete, imprecise, abstract, and even potentially incorrect. It acknowledges the uncertainty and variability in modeling individual things.

E . A UML Model can only contain statements about sets of individual things (e.g. Classifiers).

This statement is incorrect. UML models can contain statements about both individual things (instances) and sets of things (classifiers).

UML 2.5.1 Specification

While the UML specification does not explicitly state the options, it provides the foundation for UML modeling principles and allows for flexibility in expressing statements about individual things.

Remember that UML is a modeling language, and its primary purpose is to capture and communicate information about systems and their components. The level of detail, precision, and correctness can vary based on the modeling context and the specific use case. Therefore, option D best reflects the UML approach to modeling individual things.

Please note that the information provided here is based on UML 2.5.1, and it's essential to consult the official UML specification for the most accurate and up-to-date details.