OMG-OCUP2-FOUND100 Practice Questions

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Question 1

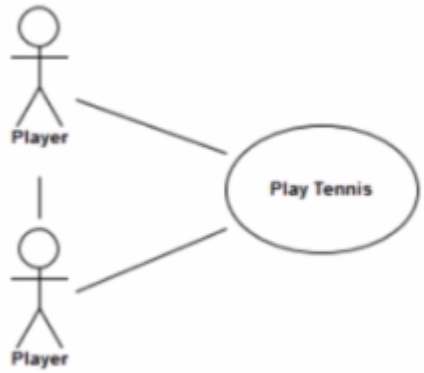
Question Type: MultipleChoice

Choose the correct answer:

Exactly two Player Instances are involved in the "Play Tennis" Use Case.

Which diagram depicts this scenario correctly?

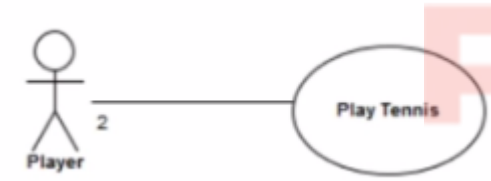
A)

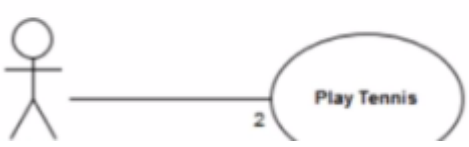


B)



C)





Options:

A- Option A
B- Option B
C- Option C

D- Option D

Answer:

C

Explanation:

In UML use case diagrams, when specifying the number of actors involved in a use case, a multiplicity marker can be used. The multiplicity marker is a number placed near the actor symbol that denotes how many instances of the actor are involved in the use case.

Option C correctly uses a multiplicity marker of '2' next to the actor 'Player', which indicates that exactly two instances of 'Player' are involved in the 'Play Tennis' use case.

Here is a brief explanation of why the other options are incorrect:

A) Option A shows two separate 'Player' actors involved in 'Play Tennis' without a multiplicity marker, implying possibly different kinds of players, but does not specify that exactly two instances are required. B) Option B shows two 'Player' actors involved in 'Play Tennis' without a multiplicity marker, also not specifying the exact number of instances required. D) Option D uses a multiplicity marker, but it is incorrectly placed near the 'Play Tennis' use case instead of the 'Player' actor, which does not follow UML notation for indicating actor multiplicity.

Therefore, the correct answer is:

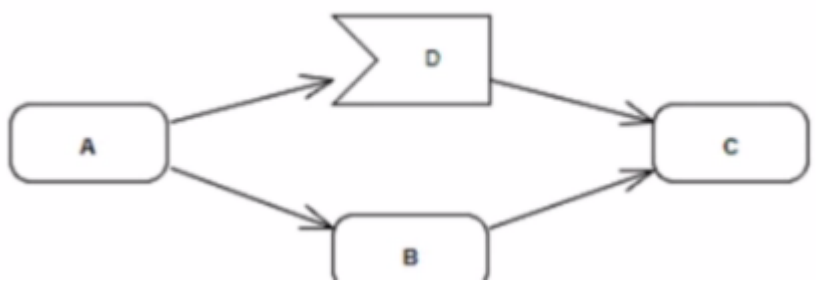
C . Option C

Question 2

Question Type: MultipleChoice

Choose the correct answer:

Which statement is true about the following diagram?



Options:

A- D has an invalid notation.
B- A. B. C. and D are actions.
C- C will be executed when B or D finishes.
D- After A finishes, either B or D will be executed, but not both.

Answer:

D

Explanation:

The diagram likely represents a UML activity diagram, which is used to model the workflow of a system. The correct answer is D because it reflects the behavior of decision nodes and concurrent flows in UML activity diagrams.

In UML, when an activity reaches a decision node (depicted as a diamond), it chooses one among several alternative flows. In this case, after the completion of action A, the flow must decide between B or D, but not both, which is a fundamental aspect of decision nodes in UML. This is supported by the UML 2.5 specification, which states that a decision node routes tokens to one of the available outgoing edges based on the conditions evaluated at runtime, ensuring that only one path is taken.

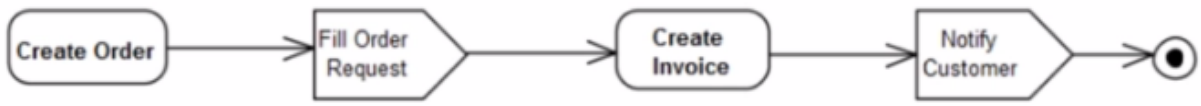
Furthermore, the UML specification explains that the notation for decision nodes and the semantics of token flows are such that they support the modeling of conditional and concurrent behaviors within an activity. This is essential for accurately capturing the logic of complex systems and their operations.

For a more in-depth understanding, you can refer to the UML 2.5.1 specification provided by the Object Management Group (OMG), which details the notation and semantics of activity diagrams, including decision nodes and flows. Additionally, studying the official OMG UML 2 Certification Guide can provide further clarification on these concepts.

Question 3

Question Type: MultipleChoice

Choose the correct answer: Consider the following diagram:



How many actions are shown?

Options:

A- 0
B- 1
C- 2
D- 3
E- 5

Answer:

E

Explanation:

The correct answer is E. 5. Based on the image you provided, the diagram depicts the following sequence of steps involved in creating an order:

Create Order:This signifies the initiation of the order process.

Fill Order Request:This step likely involves gathering information or processing details about the order.

Create Invoice:An invoice is typically generated after an order is finalized.

Notify Customer:The customer is informed about the order, possibly confirmation or receipt.

The key here is that the process starts with creating the order (step 1) and ends with notifying the customer (step 4). Steps 2 and 3 (filling the order request and creating an invoice) can happen concurrently and don't necessarily follow a specific order in relation to each other.

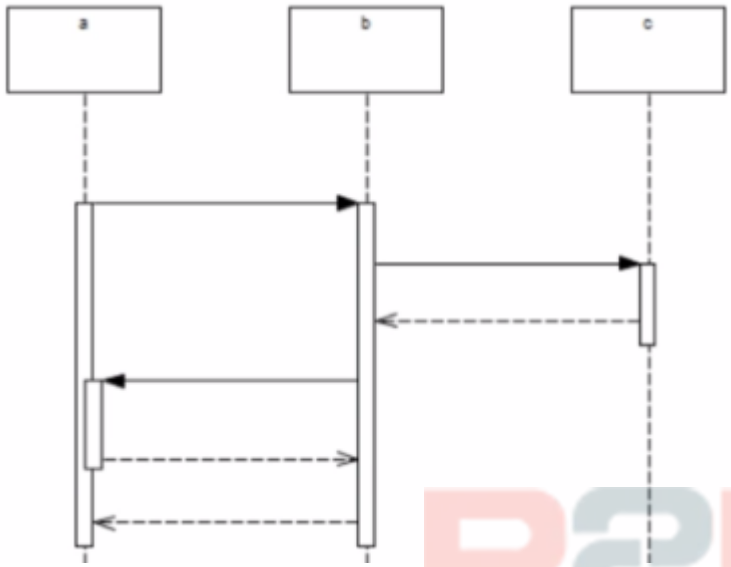
Therefore, following the logic of the sequence, there are five steps (0-based indexing), making E. 5 the most suitable answer.

Question 4

Question Type: MultipleChoice

Choose the correct answer:

How many execution occurrence specifications are there in total on the diagram below?



Options:

A- 0
B- 1
C- 2
D- 3
E- 5
E- 4
G- 7

Answer:

D

Explanation:

An execution occurrence specification in UML sequence diagrams is represented by a thin rectangle on a lifeline. It shows that an instance is performing an action over a period of time.

In the provided sequence diagram, we can see three such thin rectangles on lifeline 'b', which indicates that there are three execution occurrence specifications.

One for the message that comes from 'a' to 'b'.

Another one for the message that 'b' sends to 'c'.

And the last one for the return message from 'c' to 'b'.

There are no execution occurrence specifications on lifelines 'a' and 'c'.

Therefore, the correct answer is:

D . 3

Question 5

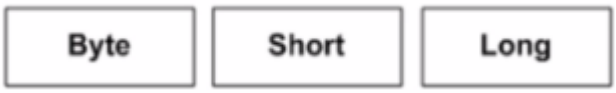
Question Type: MultipleChoice

Choose the correct answer:

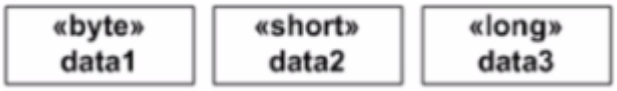
Suppose you are using a programming language that knows the following basic types: byte, short, and long.

Which diagram defines them:

A)



B)



C)



Options:

A- Option A
B- Option B
C- Option C
D- Option D

Answer:

A

Explanation:

In UML, basic types like byte, short, and long are represented as DataType elements. These are typically used to specify the types of attributes, parameters, or return values of operations in a model. Option A shows three separate classes named Byte, Short, and Long, which would represent these as distinct data types within the UML model.

Option B incorrectly uses stereotypes on objects, which is not the correct UML representation for data types. Option C shows a class with attributes of different types, but it does not define these types as basic types. Option D is incorrect because it uses stereotypes on DataType elements, which is not the standard way to represent basic types in UML.

According to the UML 2.5 specification, DataTypes are a kind of classifier that specifies a domain of values without identity (section 10.5.8). DataTypes are not classes; they do not have operations and cannot have instances that maintain an identity.

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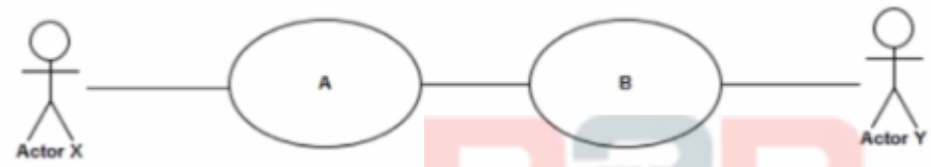
Question 6

Question Type: MultipleChoice

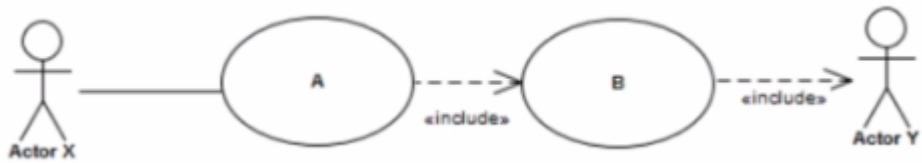
Choose the correct answer:

Which diagram contains only valid relationships?

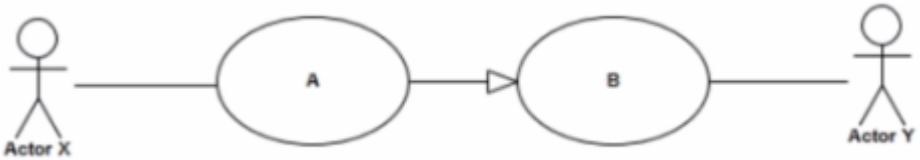
A)



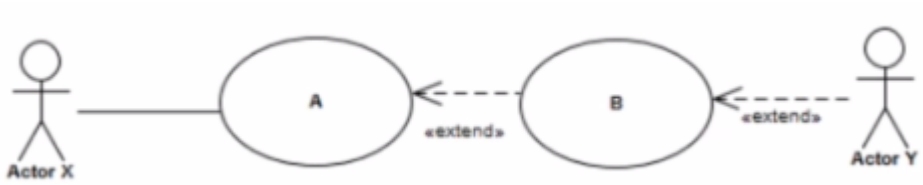
B)



C)



D)



Options:

A- Option A
B- Option B
C- Option C
D- Option D

Answer:

A

Explanation:

In UML Use Case diagrams, there are specific relationships that are valid between actors and use cases, as well as between the use cases themselves:

Associations between actors and use cases indicate that an actor participates in the use case. It is depicted as a solid line.

Includes are dependencies that specify that one use case (the base) includes the behavior of another use case (the included). It is depicted with a dashed arrow with the stereotype include.

Extends are dependencies where one use case (the extension) conditionally adds to the behavior of another use case (the base). It is depicted with a dashed arrow with the stereotype extend.

Let's analyze the provided options:

A) This diagram shows simple associations between actors and use cases, which is a valid relationship in UML use case diagrams.

B) This diagram attempts to use include relationships directly between actors and use cases, which is not correct. The include relationship is used between use cases, not between an actor and a use case.

C) This diagram shows a solid line arrow from one use case to another, which is not a recognized relationship in UML use case diagrams.

D) This diagram attempts to use extend relationships directly between actors and use cases, which is not correct. The extend relationship is used between use cases, not between an actor and a use case.

Therefore, the only diagram that contains only valid relationships according to UML standards is Option A.

Question 7

Question Type: MultipleChoice

Choose the correct answer:

Which semantics differentiate a pseudostate from a regular state in a UML state machine?

Options:

A- A pseudostate must have an outgoing transition
B- An outgoing transition from a pseudostate must always terminate on a regular state.
C- A pseudostate is transient and so cannot be the termination point of a run-to-completion step.
D- The outgoing transitions of a pseudostate must have triggers that consist exclusively of guard conditions.

Answer:

C

Explanation:

Pseudostates in UML state machines serve a different purpose than regular states. They are used as markers or waypoints to facilitate complex state transitions. Key distinctions include:

Transient Nature:Pseudostates do not represent persistent states of an object. They are not associated with entry/exit actions or internal activities like regular states. The state machine immediately transitions through a pseudostate.

Run-to-Completion Restrictions:A run-to-completion step (the sequence of states and transitions activated by a single event) cannot end in a pseudostate.

Let's analyze why the other options are incorrect:

Option A (A pseudostate must have an outgoing transition): While most pseudostates have outgoing transitions to guide the flow of the state machine, this is not a strict requirement. For example, the 'terminate' pseudostate signifies the end of a statemachine and thus has no outgoing transitions.

Option B (An outgoing transition from a pseudostate must always terminate on a regular state): While true in many cases, outgoing transitions can also target other pseudostates for more

intricate state machine designs.

Option D (The outgoing transitions of a pseudostate must have triggers that consist exclusively of guard conditions): Pseudostate transitions can have a mix of triggers, including events, timeouts, and guard conditions.

UML Specification (Superstructure) Version 2.5.1: Specifically, sections covering statemachines (Chapter 14), pseudostates (Section 14.2.3.8), and run-to-completion steps (Section 14.2.3.13). You can find it on the OMG website:https://www.omg.org/spec/UML/2.5.1

Question 8

Question Type: MultipleChoice

Choose the correct answer:

Consider the following invalid state machine fragment:



Why is the diagram invalid?

Options:

A- A transition requires a trigger or guard.
B- A guard condition is not allowed on the initial transition.
C- A trigger is not allowed on the transition to the final state.
D- A transition is not allowed to leave and enter the same state.

Answer:

D

Explanation:

The provided image depicts a state machine fragment containing an invalid transition. The state machine has a single state labeled 'S1' with an incoming and outgoing transition labeled 'e'.

According to the UML 2 Foundation documents, a transition in a state machine cannot originate from and target the same state. This type of loopback transition within a single state is not permitted.

Here's a breakdown of why other options are incorrect:

Option A (A transition requires a trigger or guard) is not necessarily true. Transitions can exist without explicit triggers or guards, although their presence is often recommended for clarity and modeling complex behavior.

Option B (A guard condition is not allowed on the initial transition) is valid. Guard conditions are indeed not allowed on the initial transition of a state machine, but the issue in the diagram is the loopback, not the presence or absence of a guard.

Option C (A trigger is not allowed on the transition to the final state) is not always true. Final states can have outgoing transitions with triggers under specific circumstances (e.g., for hierarchical state machines). However, the error here concerns the loopback nature of the transition.

UML Specification (Superstructure) Version 2.5.1, specifically sections covering state transitions (Section 14.2.3.7). You can find it on the OMG website:https://www.omg.org/spec/UML/2.5.1

Question 9

Question Type: MultipleChoice

Choose the correct answer:

What represents the most appropriate use of UML during software development?

Options:

A- forcing management decisions
B- describing a planned or existing system to non-technical stakeholders
C- capturing and clarifying the business-level concerns of a planned or existing system
D- capturing the essential characteristics and design decisions of a planned or existing system

Answer:

D

Explanation:

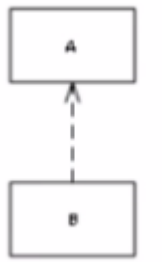
The most appropriate use of UML during software development is to capture the essential characteristics and design decisions of a planned or existing system. UML (Unified Modeling Language) is primarily utilized to visually represent the architecture, design, and behavior of a system, which includes detailing the components, relationships, and interactions within the system. This makes it a critical tool for understanding complex systems and making informed design decisions that align with project requirements and constraints. UML facilitates clear communication among development team members and stakeholders, ensuring that design decisions are well-understood and accurately implemented.

Question 10

Question Type: MultipleChoice

Choose the correct answer:

What is the meaning of the relationship shown in the diagram below?



Options:

A- class B is the creator of class A
B- class A is dependent on class B
C- class B is dependent on class A
D- class A can be reached (torn class B

Answer:

B

Explanation:

In UML 2, the dashed arrow with an open arrowhead represents a dependency relationship. In the context of class diagrams, a dependency relationship indicates that changes to one class (the independent class) may cause changes in the other class (the dependent class). The direction of the arrow specifies which class is dependent on which. In the given diagram, the arrow points from class A to class B, which means that class A is dependent on class B. This

could manifest as class A using some services or functions of class B, for example.

UML 2.5 Specification Document: The official document by the Object Management Group (OMG), which defines the syntax and semantics of UML.

UML Distilled: A Brief Guide to the Standard Object Modeling Language, Third Edition by Martin Fowler: This book provides a clear guide to UML and includes examples of dependency relationships.

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