



# OMG-OCSMP-MBA400<sup>Q&As</sup>

OMG-Certified Systems Modeling Professional - Model Builder –  
Advanced





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## QUESTION 1

Choose the correct answer.

An engineering team has been charged to design and build an embedded real-time control system using COTS (Commercial Off-The-Shelf) purchased components where possible. A technical risk for such a control system is that the system will miss (i.e. fail to respond to) critical inputs. The project has the additional risk that there may not be any components on the market that will meet both timing and cost constraints.

Given this, what information must be in the model before the engineering team can begin selecting and procuring COTS components?

- A. timing constraints for all behaviors involved in responding to a critical input
- B. (1) timing constraints for all behaviors involved in responding to a critical input (2) total system production cost provided by the customer
- C. (1) minimum period of time between any two successive critical inputs (2) maximum acceptable time to produce all outputs for a critical input (3) allocation of (2) to all behaviors involved in responding to a critical input (4) total system production cost provided by the customer
- D. (1) minimum period of time between any two successive critical inputs (2) maximum acceptable time to produce all outputs for a critical input (3) allocation of (2) to all behaviors involved in responding to a critical input (4) total system production cost provided by the customer (5) allocation of (4) to system components
- E. (1) minimum period of time between any two successive critical inputs (2) maximum number of critical inputs that will arrive in a given time interval (3) maximum acceptable time to produce all outputs for a critical input (4) allocation of (3) to all behaviors involved in responding to a critical input (5) total system production cost provided by the customer (6) allocation of (5) to system components

Correct Answer: E

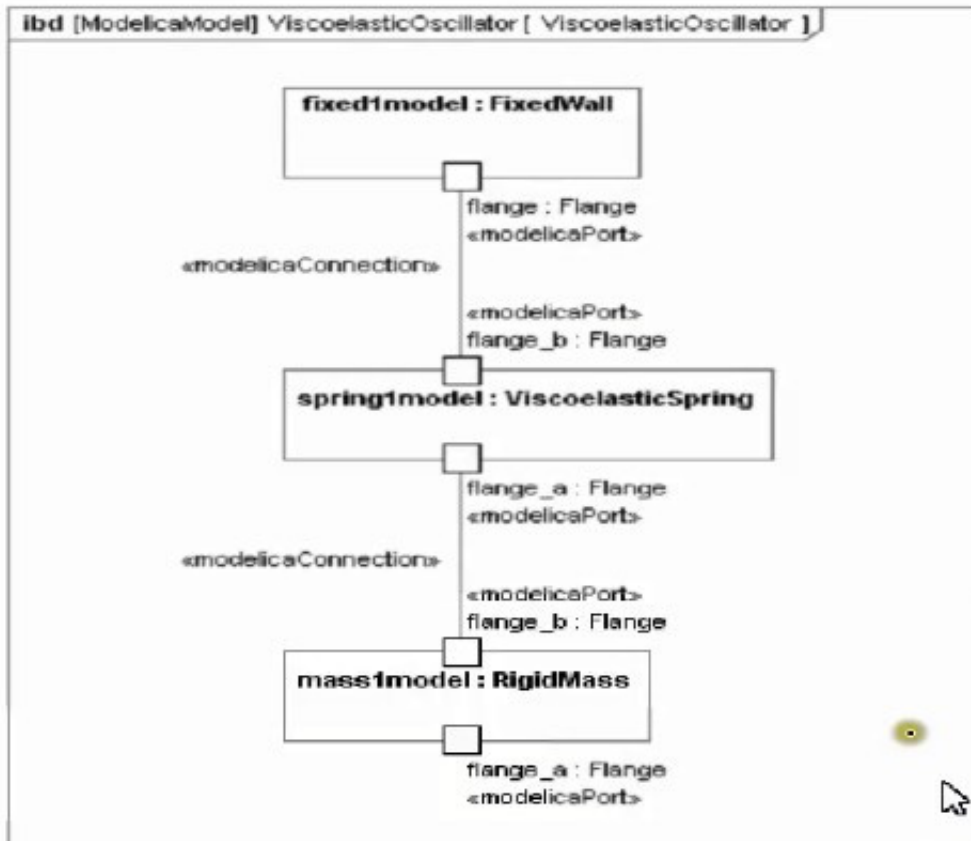
The information in option E is necessary and sufficient for the engineering team to begin selecting and procuring COTS components for the embedded real-time control system. This information defines the timing and cost requirements and constraints for the system and its components, which are essential for evaluating and comparing the available COTS components. The other options are either incomplete or irrelevant for this purpose. For example, option A does not include the minimum period of time between critical inputs, the maximum number of critical inputs, or the cost information. Option B does not include the minimum period of time between critical inputs or the maximum number of critical inputs. Option C does not include the maximum number of critical inputs or the allocation of cost to system components. Option D does not include the maximum number of critical inputs.

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## QUESTION 2

Choose the correct answer.

Given the following diagram:



Assume that all stereotypes required by the SysML-Modelica Transformation specification (if any) have been applied but are not necessarily shown here. Assume that FixedWall, ViscoelasticSpring, and RigidMass are fully defined in a Modelica library.

What else must be done to get this model ready for solving according to the SysML-Modelica Transformation specification?

- A. Provide specific values. Also define a parametric diagram that includes equations for Kirchhoff's Laws consistent with the above ibd.
- B. Provide specific values. Nothing else is required, as Kirchhoff's laws are automatically taken care of consistent with the above ibd.
- C. Nothing - it is ready as-is.
- D. Modelica cannot handle this type of nonlinear model.

Correct Answer: A

To get this model ready for solving according to the SysML-Modelica Transformation specification, one must provide specific values for the parameters and properties of the blocks, such as resistance, capacitance, voltage, etc. Also, one must define a parametric diagram that includes equations for Kirchhoff's Laws consistent with the above ibd. A parametric diagram is a SysML diagram that shows constraints and parameters on blocks and their properties. Kirchhoff's Laws are physical laws that describe how electric currents and voltages behave in a circuit. By defining a parametric diagram with these equations, one can specify how the blocks and connectors in the ibd are related mathematically.



### QUESTION 3

Choose the correct answer

A bank manager and his core team want to consolidate internal processes, detect conflicts among processes, and improve customer experience. The core team includes the lead person from each of the process areas (such as transactions,

customer management, and marketing). The manager wants to architect the overall system processes based on the following.

(1)

Relationships among the internal processes should be clearly identifiable and managed.

(2)

The core team members should be able to improve their processes simultaneously.

(3)

The architecture should aid visualization and analytics

Which model organization approach would be most efficient?

A. create a SysML model for each of the core processes and for each relationship between processes

B. create a SysML model that contains only one diagram showing all the core processes and their relationships

C. create a SysML model for each of the core processes, and manage relationships between processes in a spreadsheet

D. create a SysML model that contains a package for each of the core processes, and a package for the overall consolidated process and related relationships

E. create a SysML model that contains a package for each of the core processes, a package for each of the relationships between processes, and a package for the overall consolidated process

Correct Answer: E

This model organization approach would be most efficient because it allows the bank manager and his core team to modularize and structure their system processes using SysML packages. A package is a grouping mechanism that can contain any kind of model element, such as diagrams, blocks, activities, etc. By creating a package for each of the core processes, the team members can work on their own processes independently and concurrently. By creating a package for each of the relationships between processes, the team can identify and manage the dependencies and interactions among the processes. By creating a package for the overall consolidated process, the team can have a holistic view of the system and perform visualization and analytics using SysML diagrams and parametrics.

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### QUESTION 4

Choose the correct answer

What is the purpose of the Domain Metamodel in UPDM?

A. It defines the implementation metamodel.



- B. It defines the stakeholder requirements for the metamodel.
- C. It defines the mapping of UML to SysML and SOAML concepts
- D. It defines the melamodel concepts and relationships without any implementation

Correct Answer: D

The purpose of the Domain Metamodel in UPDM is to define the metamodel concepts and relationships without any implementation. The Domain Metamodel captures the core concepts of DoDAF and MODAF in terms of entities, attributes, associations, and constraints. It does not specify how these concepts are implemented in UML, SysML, or any other language or tool. The Domain Metamodel serves as a requirements model for UPDM and provides traceability links between the domain concepts and the profile elements.

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### QUESTION 5

Choose the coned answer

What characterizes a complete SysML model?

- A. All of its element trace back to requirements that are within the scope of the project
- B. It uses all SysML diagram types to model all aspects of the system or part being modeled.
- C. It includes a complete set of SysML constructs and associations for the system being modeled
- D. It has all the necessary information relevant at the level of abstraction that the model represents.

Correct Answer: D

A complete SysML model is one that has all the necessary information relevant at the level of abstraction that the model represents. A complete model does not necessarily have to trace back to all requirements, use all diagram types, or include all constructs and associations. A complete model should capture the essential features and properties of the system or part being modeled, without being too detailed or too abstract. A complete model should also be consistent, coherent and correct. References: OMG- Certified Systems Modeling Professional - Model Builder ?Advanced (OCUP2-ADV) Examination Guide Version 1.0, Section 4.1

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