Chapter 1

Solution Manual for Practical Guide to SysML The Systems Modeling Language 1st Edition Friedenthal Moore Steiner

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1. What are some of the demands that are driving system development?
Answer:
a) Competitive demands to leverage technological advances to provide continuously increasing capability at reduced costs and shorter delivery cycles
b) Interconnected systems where systems are now part of a larger whole

2. What is the purpose of systems engineering?
Answer:
Develop balanced system solutions that satisfy diverse stakeholder needs?

3. What are the key activities in the system specification and design process?
Answer:
- Elicit and analyze stakeholder needs
- Specify the system
- Synthesize alternative system solutions
- Perform trade-off analysis
- Maintain traceability

4. Who are the typical stakeholders that span a system's life cycle?
Answer:
Operator/user, Manufacturer, Maintainer, Governments, ..

5. What are different types of requirements?
Answer:
Functional, Interface, Performance, Physical, Quality attributes such as reliability and maintainability

6. Why is it important to have a multidisciplinary systems engineering team? ***Answer***:
To provide the understanding and expertise of the multiple stakeholder and technical and engineering domains

7. What are some of the roles on a typical systems engineering team?

Answer:

Management, Requirements Analyst, Architect, System Analyst, Tester

8. What role do standards play in systems engineering?

Answer:

Help to codify the practice and provide a way for sharing this practice across broad industry domains.

Chapter 3

1. What are some of the primary distinctions between MBSE and a document-based approach?

Answer:

In MBSE, the emphasis is on producing and controlling a coherent system model rather than the documentation

2. What are some of the benefits of MBSE over the document-based approach?

Enhanced communications
- Increased precision of the specification and design
- Enhanced design integration

Enhanced reuse of system artifacts

3. Where are the model elements of a system model stored?

Answer:

Model repository

4. Which aspects of the model can be used to define the scope of the model?

Answer:

Breadth, depth, and fidelity of the model

5. What constitutes a good model?

Answer:

It meets its intended purpose

6. What are some of the quality attributes of a good model?

Answer:

Defined scope
- Degree of model completion relative to its scope
- Degree of consistency
- Degree of well-formedness
- Understandability

Self documenting

Documented modeling conventions

7. What is the difference between a good model and a good design?

Answer:

Good model accomplishes its purpose. Good design satisfies its requirements

8. What are examples of questions that MBSE metrics can help answer?

Answer:

What is the design quality?

What is the progress of the design/development effort?

What is the estimated effort to complete the design/development?

9. What are possible sizing parameters that could be used to estimate an MBSE effort?

Answer:

#Use cases

#Scenarios

#States

#System/component interfaces

#System/component activities or operations #System/component properties

#Components by type (e.g., hardware, software, data, operational procedures) #Test cases