**Subject Area Exam – Modeling**

1. What is the difference between a customer and an end-user?

Answer (Section 7.3.1):

In many cases the customer is the person requesting the creation of a software product for an end-user to actually make use of.

1. List the representations needed for requirements and design models?

Answer (Section 7.3.3):

Requirements model –information, functional, behavioral

Design model – architecture, user interface, component-level detail

1. Describe the key elements of construction practice.

Answer (Section 7.3.4):

Construction practice is made up of the coding and testing tasks that lead to the delivery of operational software to the customer or end-user. Coding is concerned with the selection of the programming languages, tools, standards, and environments needed to implement the design. Testing involves validation of individual components, verifying the successful integration of components into the system, and acceptance of the completed system by the customer.

1. What are the six steps for requirements engineering?

Answer (Section 8.1):

* Inception
* Elicitation
* Elaboration
* Negotiation
* Specification
* Requirements validation

1. Describe the job of the requirements engineer with respect to stakeholder collaboration?

Answer (Section 8.2.3):

The requirements engineer needs to identify areas of stakeholder commonality, conflict, and inconsistency on the desired needs or features.

1. What are the benefits of using analysis patterns during the analysis modeling process?

Answer (Section 8.5.2):

Patterns suggest solutions (a class, a function, or a behavior) that can be reused when modeling future applications. Analysis patterns can speed up the development of abstract analysis models by utilizing reusable models. Facilitate the transformation of the analysis model into a design model by suggesting design patterns and reliable solutions to common patterns.

1. Describe the purposes of domain analysis.

Answer (Section 9.1.3):

* Umbrella activity involving the Identification, analysis, and specification of common requirements from a specific application domain, typically for reuse in multiple projects
* Object-oriented domain analysis involves the identification, analysis, and specification of reusable capabilities within a specific application domain in terms of common objects, classes, subassemblies, and frameworks

1. Which UML (unified modeling language) diagrams are useful in scenario-based modeling?

Answer (Section 9.2):

* use-case diagrams
* activitiy diagrams
* swimlane diagrams

1. What questions should be asked to help refine a preliminary use case?

Answer (Section 9.2.2):

* Can an actor take some other action at this point?
* Is it possible that the actor will encounter some error condition at this point?
* Is it possible the actor will encounter some other behavior at this point?

1. What types of nouns resulting from a grammatical parse should be considered as potential analysis classes?

Answer (Section 10.1):

* External entities (systems, devices, people)
* Things (e.g. reports, displays, letters, signals)
* Events occurring during system operation
* Roles (e.g. manager, engineer, salesperson)
* Organizational units (e.g. division, group, team)
* Places
* Structures (e.g. sensors, vehicles, computers)

1. Describe the roles of the three sections of CRC (class responsibility collaborator) cards?

Answer (Section 10.4):

* Class name identifies the data object uniquely.
* Responsibilities are the attributes and operations for the class.
* Collaborators are those classes required to provide a class with information needed to complete a responsibility.

1. List three types of classes that may be present in the analysis model.

Answer (Section 10.4):

Entity classes, Boundary classes, Controller classes

13. What are the steps needed to build a behavioral model?

Answer (Section 11.1)

* Evaluate the use-cases to understand the interaction sequence within the system.
* Identify events that drive the interaction sequence and how the events relate to specific objects.
* Create an event trace for each use-case.
* Build a state transition diagram for the system.
* Review the object-behavior model to verify accuracy and consistency.

14. How should analysis patterns be documented once they are discovered?

Answer (Section 11.4)

The pattern documentation contains a description of the problem, the prescribed solution, assumptions, constraints, motivations, driving forces, advantages, disadvantages, and references to know applications.

15. How should analysis Describe the contents of the WebApp content, functional, interaction,

and configuration models.

Answer (Section 11.5.3):

* Content model - structural elements that represent WebApp content requirements (UML class diagrams)
* Functional model - user observable behavior delivered to end-users and operations contained in analysis classes to implement class behaviors (UML activity diagrams)
* Interaction model – indicates how users make use of the WebApp content and functionality (use-cases, UML sequence diagrams, state diagrams, user interface prototype)
* Configuration model - may be a list of server-side and client-side attributes required for the WebApp (UML deployment diagrams)