Software Engineering

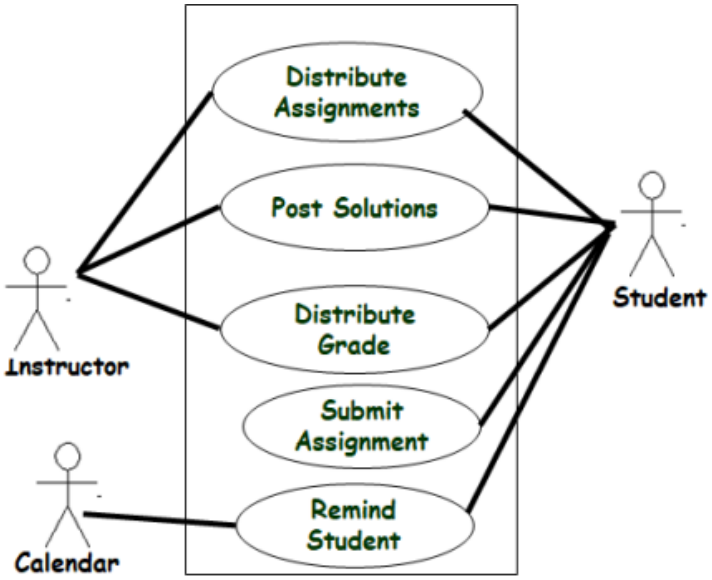
Assignment-9

TYPE OF QUESTION: MCQ/MSQ

Number of questions: **10** **Total mark: 10 X 1 = 10**

QUESTION 1:

Consider the following use case diagram for a supermarket automation software.



Based on the use case diagram, how many boundary classes should be designed in the domain model?

a. 3

b. 5

c. 6

d. 8

e. 9

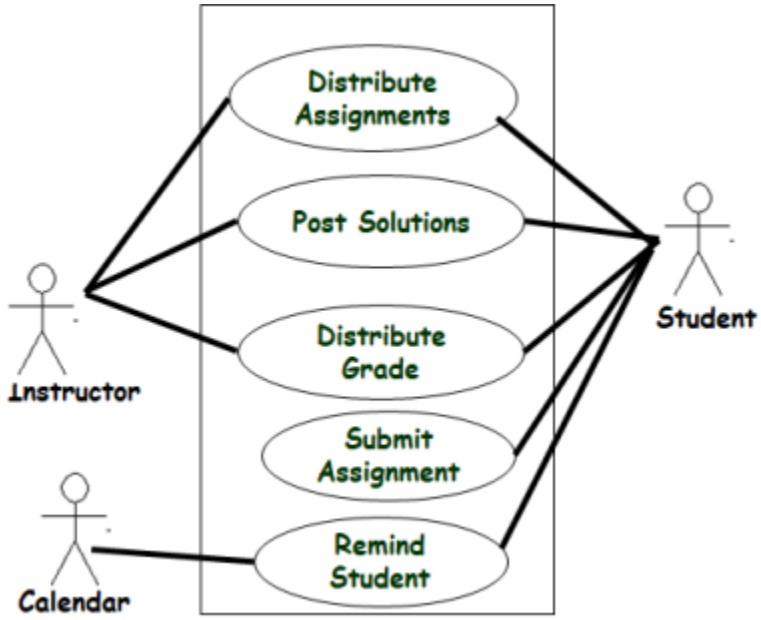
Correct Answer: e. 9

Detailed Solution:

The number of links between user and use cases represents the number of boundary classes in a use case diagram.

QUESTION 2:

Consider the following use case diagram for a supermarket automation software.



Based on the use case diagram, how many controller classes should be designed in the domain model.

a. 3

b. 4

c. 5

d. 6

e. 7

Correct Answer: c. 5

Detailed Solution:

The number of use cases in a use case diagram represents the number of possible controller classes in the domain model.

QUESTION 3:

Which of the following statements are **FALSE** regarding CRC cards?

a. CRC cards are used to assign methods to classes

b. CRC cards are used to assign class-level attributes to classes

c. CRC cards stands for Class-Responsibility-Collaborator cards

d. Use of CRC cards involves performing structured walkthrough of use case scenarios

e. CRC cards are used to determine transitions among the states of various objects

Correct Answer: b. CRC cards are used to assign class-level attributes to classes

e. CRC cards are used to determine transitions among the states of various objects

Detailed Solution:

Responsibilities on CRC cards typically represent methods/behaviors that a class should have. Also, CRC cards primarily focus on responsibilities and collaborations.

QUESTION 4:

Which of the following do not serve as guidelines for identifying entity classes from a problem description?

a. Entity classes usually appear as data stores in a DFD model

b. Entity classes usually occur as group of objects that are aggregated

c. The number of classes is equal to the number of use cases in the use case model of the system

d. The aggregator of the objects of an entity class corresponds to a register in the physical world

e. All actors present in the use case diagram are to be considered as entity classes

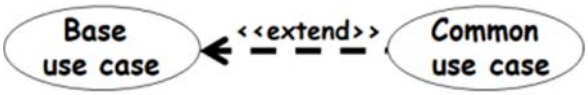
Correct Answer: c. The number of classes is equal to the number of use cases in the use case model of the system.

e. All actors present in the use case diagram are to be considered as entity classes

Detailed Solution:
Entity classes represent things about which the system stores information. Therefore, options c and e are not related to entity classes.

QUESTION 5:

Consider the following use case factorization.



Which one of the following is implied by the above factoring?

a. Base use case is a generalization of the common use case

b. Common use case is a generalization of the base use case

c. Base use case optionally includes common use case

d. Common use case optionally includes base use case

e. Base use case compulsorily includes common use case

Correct Answer: c. Base use case optionally includes common use case
Detailed Solution:
<<entends>> generally represents that the base use case optionally includes common use case

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QUESTION 6:

Which of the following are the mechanisms supported in UML to factor a complex use case into simpler use cases?

a. Generalization-specialization

b. Include

c. Extend

d. Dependency

e. Aggregation

Correct Answer: a. Generalization-specialization

b. Include

c. Extend

Detailed Solution:
In UML (Unified Modeling Language), complex use cases can be broken into simpler, reusable, or conditionally executed use cases using generalization-specialization, include, and extend mechanisms.

QUESTION 7:

CRC cards are usually not very useful in performing which of the following activities?

a. Method identification for each class

b. Responsibility assignment

c. Identification of state transitions in state machine model design

d. Collaborator identification

e. Class state identification

Correct Answer: c. Identification of state transitions in state machine model design

e. Class state identification

Detailed Solution:

- State transitions and state machine design are typically modeled using UML state diagrams, not CRC cards.
- CRC cards do not focus on dynamic behavior or state changes of objects over time.

QUESTION 8:

Which of the following statements concerning CRC cards are **FALSE**?

a. CRC cards are used to assign methods to classes

b. CRC cards are used to assign static attributes to classes

c. CRC cards stands for Class-Responsibility-Collaborator cards

d. CRC cards are an automated method to create class diagrams

e. While using CRC cards, it is imperative to perform structured walkthrough of use case scenarios

Correct Answer: b. CRC cards are used to assign static attributes to classes

d. CRC cards are an automated method to create class diagrams

Detailed Solution:
CRC cards do not focus on assigning static attributes (like member variables or properties). They primarily focus on assigning responsibilities (what the class does) and identifying collaborators (who it works with). CRC cards are a manual, lightweight, and informal design tool, typically done on index cards or simple templates, not an automated method. While they help with class design, they do not directly create class diagrams; that's done separately in UML tools.

QUESTION 9:

Which one of the following can be inferred from the pesticide paradox?

a. A larger number of bugs are detected towards the end of testing

b. More severe bugs are detected towards the end of testing

c. After a test methodology has been used on a program to detect bugs, it is ineffective for detecting the remaining bugs

d. A set of test methodologies should be applied again and again until all bugs are eliminated

e. A persistent bug calls for simultaneous application of multiple test cases

Correct Answer: c. After a test methodology has been used on a program to detect bugs, it is ineffective for detecting the remaining bugs

Detailed Solution:

Using the same test cases repeatedly may no longer uncover new faults. To be effective, tests need to be reviewed and revised, and new and varied test cases should be added.

QUESTION 10:

An untested software system starts with 640 bugs. A series of three independent testing techniques is applied in sequence, each removing 50% of the existing bugs. However, each time a bug is fixed, there is a 50% chance that a new bug is introduced. How many bugs approximately remain after all three testing and bug-fix cycles?

a. 200

b. 270

c. 350

d. 448

e. 512

Correct Answer: b. 270

Detailed Solution:

Cycle 1:

- Start: **640 bugs**
- Remove 50% → **640 × 0.5 = 320 bugs removed**
- 320 bugs remain
- **New bugs introduced = 50% of 320 removed = 160**
- **Total bugs after cycle 1 = 320 (left) + 160 (new) = 480**

Cycle 2:

- Start: **480 bugs**
- Remove 50% → **240 bugs removed**
- 240 bugs remain

- **New bugs introduced = 50% of 240 = 120**
- **Total bugs after cycle 2 = 240 + 120 = 360**

Cycle 3:

- Start: **360 bugs**
- Remove 50% → **180 bugs removed**
- 180 bugs remain
- **New bugs introduced = 50% of 180 = 90**
- **Total bugs after cycle 3 = 180 + 90 = 270**

Therefore, 270 bugs approximately remain after all three cycles

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