Object Oriented Analysis and Design: Assignment 5

Total Marks : 20

August 17, 2022

Question 1

Which of the following **UML diagrams** captures the hardware topology of a system?

Marks: 2 **MSQ**

a) Behavioral Diagram

b) Structural Diagram

c) Component Diagram

d) Deployment Diagram

Answer: b), d)
Explanation: `Deployment Diagrams` capture the hardware topology of a system. It is a `Structural diagram`. Please refer to Module 21, Slide 15.

Question 2

Consider a visa office. In this system, applicants fill up visa application forms. Then, applicants submit fees. If the applicant is a senior citizen, he/she gets a concession. Once, fees are paid, an applicant must print receipt.
Identify the correct statement from the following.

Marks: 2 **MSQ**

a) `Get concession` use case extends the `Submit fees` use case.

b) `Get concession` use case is included by the `Submit fees` use case.

c) `Print Receipt` use case extends the `submit fees` use case.

d) `Print receipt` use case is included by the `submit fees` use case.

Answer: a), d)
Explanation: The $\langle\langle include \rangle\rangle$ relationship describes the mandatory system behavior that is executed under all conditions.
The $\langle\langle extend \rangle\rangle$ relationship describes the optional system behavior that is extended only under certain conditions.
Hence, options (a) and (d) are correct.

Question 3

Which of the following diagrams is (are) not produced as output of the `Analysis Phase`?

Marks: 2 **MCQ**

a) The `Use Case Diagrams`

b) The `Activity Diagrams`

c) The `Sequence Diagrams`

d) The `Statechart Diagrams`

Answer: a)
Explanation: According to Module 22, option (a) is correct.

Question 4

Which of the following does not belong to `Requirement Specification Phase` of `SDLC`?

Marks: 2 **MCQ**

a) Use Case Model

b) Problem Domain Model

c) Behavioural Model

d) Interface Model

Answer: c)
Explanation: As per lecture notes (Module 22:8), option (c) is correct.

Question 5

Match entries in the column A of the following table with the related entries in column B

Sl. No.	Column A	Sl. No.	Column B
1.	`include relationship`	a)	To isolate optional logic to reduce the complexity of the use case narrative
2.	`extends relationship`	b)	To define specialized forms of actors or use cases
3.	`generalization`	c)	To isolate an exception flow of events from a main flow of events
		d)	To isolate redundant events flows shared by multiple use cases

Marks: 2 **MCQ**

a) 1-a, 2-b, 3-c

b) 1-b, 2-a, 3-d

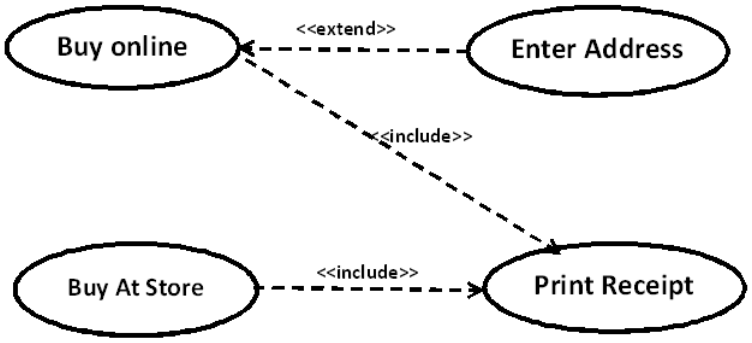
c) 1-d, 2-a, 3-b

d) 1-d, 2-a, 3-c

Answer: c)
Explanation: The $\langle\langle include \rangle\rangle$ relationship describes the mandatory system behavior that is executed under all conditions.
The $\langle\langle extend \rangle\rangle$ relationship describes the optional system behavior that is extended only under certain conditions.
The `generalization` relationship defines specialized forms of actors or use cases.

Question 6

Consider the following `Use cases`:



Identify the correct statement(s) from the following. *Marks: 2* **MCQ**

a) `Print Receipt` use case executes optionally with `Buy Online`.

b) `Enter Address` use case executes optionally with `Buy Online`.

c) `Buy At Store` use case is the enhancement of the use case `Buy Online`.

d) `Print Recipt` use case enhances the use case `Buy At Store`.

Answer: b)
Explanation: The $\langle\langle include \rangle\rangle$ relationship adds additional functionality not specified in the base use case. Included use case required, not optional or not an enhancement. Therefore, options (a), (c) and (d) are incorrect.
Extending the use case is optional, supplementary. Hence, option (b) is correct.

The following paragraph is the basis for Questions 7 to 10.
Consider an examination system. The candidate has to fill up a form and then make a payment. A committee verifies the application form. There is an enrollment office which generates admit cards and distributes them. On receiving the admit card, the candidate sits for the examination. Examiners check answerscripts and submit marks. Based on the marks given by the examiner, the enrollment office produces grade cards.

Question 7

Which of the following is not an actor? *Marks: 2* **MSQ**

a) Form

b) Candidate

c) Verification Committee

d) Examination.

Answer:(a), (d)
Explanation: Candidate and Verification committee interacts with the system. But form and examination do not interact with the system. Hence, options (a) and (d) are correct.

Question 8

How many `actors` and `use cases` respectively are required in the `use case diagram` for the system so described?

Marks: 2 **MCQ**

a) 3, 8

b) 4, 10

c) 3, 10

d) 4, 9

Answer: d)
Explanation: An `Actor` can be a human or non-human, but it must be either the ultimate user of the system (Primary Actor) or ensures the correct functionality of the system (secondary Actor). In the given problem, there will be four actors in the given problem - `Applicant`, `Verification Committee`, `Enrollment Office`, and `Examiner`.
There are 9 `use case`s: `Fill up form`, `Make Payment`, `Give examination`, `Verify form`, `Check answescipt`, `Submit Marks`, `Generate admit card`, `dispatch admit card`, and `Prepare grade card`.

Question 9

Suppose that you have created a `use case diagram` for the examination system already mentioned. Consider that the following requirement is added to the examination system already mentioned:
If a candidate gets F grade, he/she may sit for a supplementary examination.
Identify the correct statement for the newly added `use case` in the `use case diagram` for the examination system.

Marks: 2 **MCQ**

a) The use case `sit for supplementary examination` will be connected through an `include` relationship to an existing `use case`.

b) The use case `sit for supplementary examination` will be connected through an `extends` relationship to an existing `use case`.

c) The use case `sit for supplementary examination` will be connected through a `generalization` relationship to an existing `use case`.

d) The use case `sit for supplementary examination` will be not be connected to any existing `use case`.

Answer: b)
Explanation: The flow of events for `sit for supplementary examination` is optionally added to the flow of events of the `sit for examination` if the student get an F grade.
But the flow of events for `sit for supplementary examination` is not mandatorily added to the flow of events of the `sit for examination`.
Moreover, the flow of events for `sit for supplementary examination` is not a special case of the flow of events of the `sit for examination`. Hence, option (b) is correct.

Question 10

Suppose that you have created a `use case diagram` for the examination system already mentioned before Question 7. Consider that the following requirement is added to the examination system already mentioned before Question 7.
Payment may be made either by online or through credit card. The payment is processed by a payment gateway.
Which of the following is the best way to capture this new requirement in `use case diagram` on top of the existing `use case diagram`?

Marks: 2 **MSQ**

a) Adding a new actor.

b) Adding new use cases.

c) Using `include` relation between use cases.

d) Using `generalization` among use cases.

Answer: a), b), d)
Explanation: Addition of an actor `Banking system` and two use cases `Pay online` and `Pay by card` is necessary. So, options (a), and (b) are correct.
Only way to connect the new uses cases to existing `Make payment` use case is to add them by inheritance. So, option (d) is also correct.