Name	1.1	1.2	1.3	1.4
1.5				

1.6	1.7	1.8	1.12
1.9	1.10	1.11	

Office

Employee

2.1

2.2

3

4.1 & 4.2
4.3
5

MoSIG 1 - Software Engineering Mid-term Exam 2025-26
No document, no electronic devices

Exercise 1 (7)

Q.1.1 What is the main principle behind the Waterfall model?
(A) Continuous integration of portion of the system (B) Emphasis on risk management
(C) Minimal documentation (D) Sequential development

Q.1.2 What is the main disadvantage of the V-shape model?
(A) Difficulty in accommodating changes (B) Emphasis on user involvement
(C) Emphasis on validation (D) Rapid development pace

Q.1.3 The incremental processes promote:
(A) deep architectural refactoring steps for each increment (B) detailed documentation
(C) rapid development pace (D) technical excellence (E) None of the previous

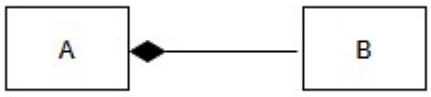
Q.1.4 I'm a requirement elicitation technique used to make emerge new ideas through discussions. What is my name?
(A) Brainstorming (B) Focus Group (C) Interview (D) Introspection (E) Questionnaire (F) None of the previous

Q.1.5 Give 2 reasons why requirement elicitation is a difficult task. One simple sentence by reason.

Q.1.6 Which of the following requirements can be considered to be related to maintainability?
(A) Each page must load within 2 seconds.
(B) The back-up process must finish within 3 hours.
(C) The technical documentation should include a description of the detailed design.
(D) The system must meet Web Content Accessibility Guidelines WCAG 2.1.
(E) The application must support Windows 11 operating system and above.
(F) None of the previous

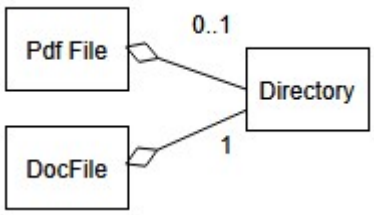
Q.1.7 Choose the correct affirmation(s) about UML
(A) It is an elicitation method (B) It is a development method (C) It is a development process
(D) It is a language (E) None of the previous

Q.1.8 In UML, which of the following statement(s) are true w.r.t. the following diagram?



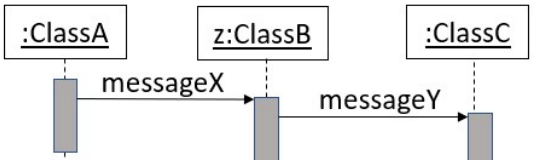
(A) A is a kind of B
(B) B is a kind of A
(C) A is a part of B
(D) B is a part of A
(E) None of the previous

Q.1.9 You want to draw an object diagram that satisfies the following class diagram. How many objects you can associate to a Directory object?



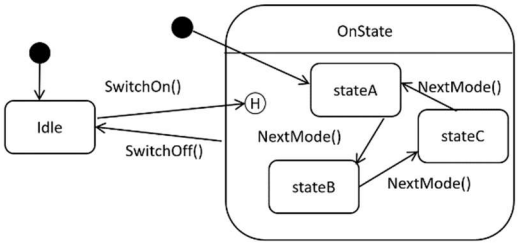
(A) 0
(B) 0 or 1
(C) Exactly 1
(D) 1 or 2
(E) Exactly 2
(F) 2 and more
(G) None of the previous

Q.1.10 In the following diagram, "<u>:ClassA</u>" represents



(A) an agent
(B) an interaction
(C) an object
(D) a class
(E) None of the previous

Q.1.11 In which state is the system after the method call sequence
"SwitchOn(), NextMode(), SwitchOff(), SwitchOn(),NextMode(),"?
(A) Idle (B) H
(C) StateA (D) StateB (E) StateC
(F) error (impossible sequence) (G) None of the previous

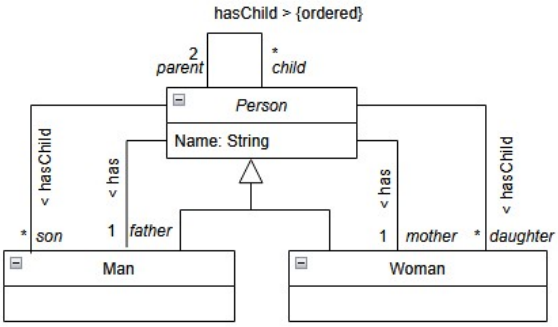


Q.1.12 Draw an adequate diagram to express that: "An office can be allocated several employees or empty (this means that the office is allocated to no employee). An employee has at most one office."

Exercise 2 (3)

Q.2.1 Rephrase the diagram on the right in English or in French. One sentence by line. Keep them simple.

Q.2.2 Draw an object diagram that satisfies the previous class diagram and that represents the sentence "Annie (a woman) is the daughter of Leon (a man) and Louise (a woman)".
If it is not possible, explain why.



Exercise 3 (2,5)

Let's study a vending machine system. This system sells food products (drinks, sweets) and other types of everyday objects (toothbrush, soap, etc.). Once the customer has selected what he wants to buy, he has to pay it. Payment can be done by credit card or by cash. When a food product has been selected, the machine must check the expiry date of the product.
Q.3 Propose a use case diagram to model for this text.

Exercise 4 (4)

The customers of a company have a name and an address. They can be either personal customers or corporate customers. A contact name for a corporate customer should be defined, as well as the credit card number for the personal customer. Any customer can place commands. A command can be placed by a single customer. Each command has a date, an identification number and a total price. A command is composed of command lines. A command line indicates how many items of one product are asked. Thus, a command line indicates the quantity of this product, and the total price of the line. For each product, its reference and its unitary price are known.
Q.4.1 Give a class diagram to model this text. Feel free to ask non-trivial questions if needed.

Peter is a personal customer. He creates a command, in which he creates two different command lines before removing the second one.
Q.4.2 Give a sequence diagram to model this text. Your proposition has to be consistent with your class diagram. In your proposition you can omit the representation of the product objects.

Exercise 5 (3,5)

In this exercise, we want to model the behaviour of the motor controlled by a DVD player. This DVD player has a set of buttons including "switch-on", "play", "pause", "stop", and "switch-off".

When the DVD player is switched on, the motor is unpowered. When the "play" button is used, the motor is powered and starts running. The motor is unpowered whenever the "stop" button is used. The pause button can be used to suspend the DVD reading: the motor is still powered, but it is no longer running. If the "play" button is used at this step, the motor runs again. If the pause button is used twice consecutively, the motor is unpowered. It is always possible to "switch-off" the DVD player.
Q.5 Propose a model to capture the behaviour of the engine. Use hierarchy whenever it is possible. Feel free to ask non-trivial questions if needed.