



## Advanced Software Engineering

The exam consists of four Questions in four Pages.

Total Marks: 70 Marks

1/4

### تعليمات هامة

- (1) حيازة التليفون المحمول مفتوحا داخل لجنة الامتحان يعتبر حالة غش تستوجب العقاب وإذا كان ضروري الدخول بالمحمول فيوضع مغلق في الحقيبة.
- (2) لا يسمح بدخول سماعة الأذن أو البلوتوث. وكذلك لايسمح بدخول أي كتب أو ملازم أو أوراق داخل اللجنة والمخالفة تعتبر حالة غش.

### Answer all Questions

#### Question 1 [24 Marks]

The following use case description shows the details of a participant (student) deleting a comment about specific course material on an LMS

Delete Comment
<b>Brief description:</b> The actor deletes a comment
<b>Actors:</b> Group Leader
<b>Preconditions:</b> The actor is a registered student
<b>Basic flow of events:</b> <ol style="list-style-type: none"> <li>1. The actor logs into the system</li> <li>2. The system authenticates the actor and starts a session</li> <li>3. The actor chooses to delete a comment</li> <li>4. The actor is guided by the system to fill in required information to de</li> <li>5. The system acknowledges that comment deleted</li> <li>6. The actor leaves the system</li> </ol>

#### Extensions:

- 1a. The system fails to authenticate the actor.
- The system informs the actor and doesn't allow the actor to proceed
- 3a. The system fails to delete comment

- a) Describe the requirement of the given use case as a user story [4 Marks]
- b) List the analysis classes needed for the use case of *delete\_Comment* [4 Marks]
- c) Create a related system sequence diagram [4 Marks]
- d) Draw as complete as possible use case diagram for the LMS [4 Marks]
- e) Design suitable GUI for this system [4 Marks]
- f) Use design thinking, to ideate two ideas suitable for the student [4 Marks]

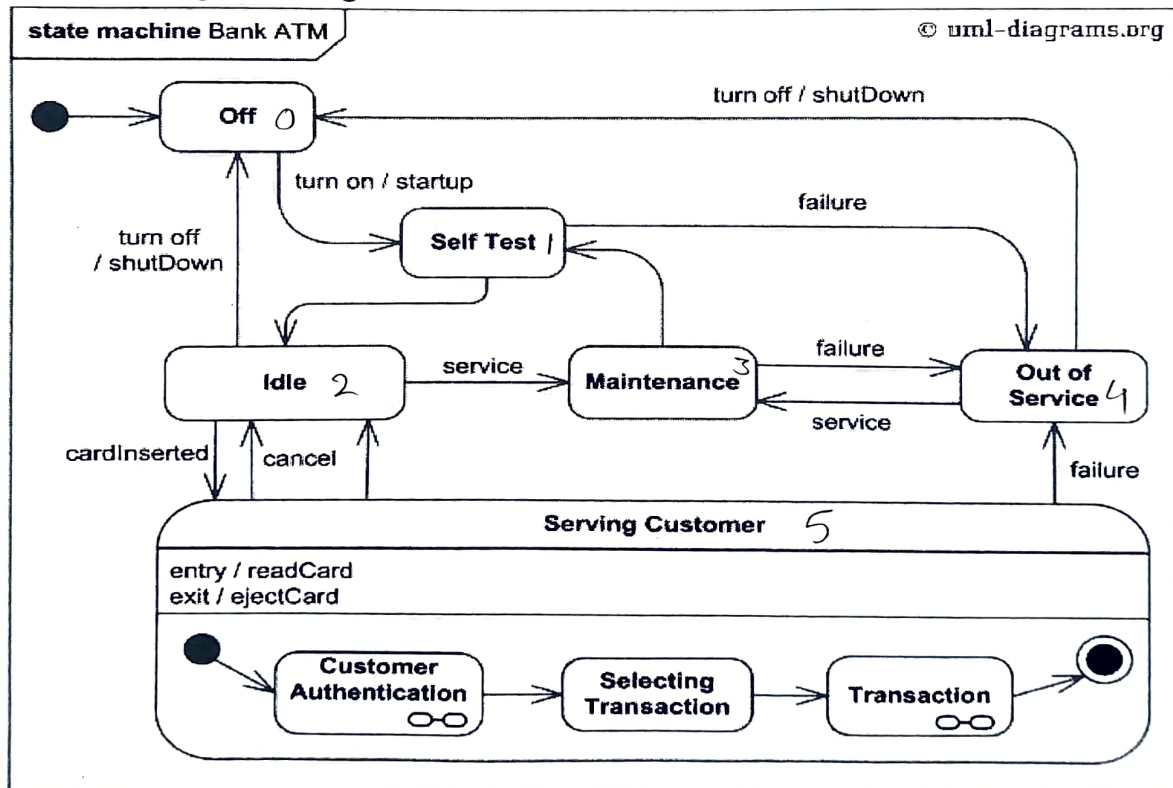
#### Question 2 [20 Marks]

Briefly define the following terms (2 marks each):

- a) XP
- b) FP
- c) RAD vs JAD
- d) Composition vs shared aggregation
- e) UX vs UI
- f) Front Loading
- g) MoSCoW
- h) Sprint in SCRUM
- i) Backlog in SCRUM
- j) INVEST

**Question 3 [8 Marks]**

The Following state diagram describes an ATM machine:



- a) Create two event sequences, one for happy end scenario and another for maintenance work [4 marks]
- b) Provide a detailed test cases needed to cover all states of the state transition model [4 marks]

**Question 4 [18 Marks]**

Choose the most suitable answer:

- ✓ 1. What is the primary goal of Software Engineering?
  - a) Writing code quickly
  - ✓ b) Developing high-quality software efficiently
  - c) Maximizing project budget
  - d) Meeting tight deadlines
- ✓ 2. Which software development model is known for its flexibility and adaptability to changes during the development process?
  - a. Waterfall model b. Agile model
  - ✓ c. Spiral model d. V-Model
- ✓ 3. In the context of software testing, what does the term "White Box Testing" refer to?
  - a) Testing based on external specifications
  - b) Testing the software's internal logic and structure
  - ✓ c) Testing the user interface
  - d) Testing the software's performance
- ✓ 4. What is the purpose of the SCRUM framework in Agile development?
  - a) To define project requirements
  - b) To manage project scope
  - ✓ c) To facilitate communication and collaboration among team members
  - d) To create detailed project documentation
- ✓ 5. Which software design principle promotes breaking down a system into smaller, manageable, and interchangeable components?
  - a. Encapsulation b. Abstraction
  - ✓ c. Modularity d. Inheritance
- ✓ 6. Which software testing technique involves testing individual units or components of a software application in isolation?
  - a. Integration testing b. System testing
  - ✓ c. Unit testing d. Acceptance testing
- ✓ 7. What is the purpose of the Unified Modeling Language (UML) in software engineering?
  - a) To write code
  - b) To design user interfaces
  - ✓ c) To create visual models of software systems
  - d) To manage project finances
- ✓ 8. Which software testing level focuses on the interaction between different components or systems?
  - a. Unit testing b. Integration testing
  - ✓ c. System testing d. Acceptance testing
- ✓ 9. What does the term "Refactoring" mean in software engineering?
  - a. Rewriting code from scratch
  - b. Adding new features to existing code
  - ✓ c. Improving code quality without changing its functionality
  - d. Debugging code
- ✓ 10. What is the purpose of a "Use Case" in software engineering?
  - a) To document the steps for installing software
  - b) To describe the interactions between system components
  - ✓ c) To specify how a system interacts with external entities or actors
  - d) To define the structure of a database



**11. What is the role of a Software Architect in the software development process?**

- a) Writing code
- b) Managing project timelines
- ☒ c) Designing the overall structure and organization of the software system
- d) Conducting user acceptance testing

**12. What is the purpose of a "User Story" in Agile development?**

- a) To document technical specifications
- ☒ b) To represent a user's perspective and requirements
- c) To create a detailed project schedule
- d) To define coding standards

**13. Which software development methodology emphasizes customer collaboration, responding to change, and delivering a minimum viable product quickly?**

- a. Waterfall model
- b. Agile model
- ☒ c. Spiral model
- d. V-Model

**14. Which software development metric measures the number of delivered lines of code per developer per day?**

- a) Code Quality Index (CQI)
- ☒ b) Lines of Code (LOC)
- c) Velocity
- d) Code-to-Test Ratio (CTR)

**15. In the context of Agile development, what is the purpose of a "Sprint Review"?**

- a) To plan the tasks for the upcoming sprint

- b) To retrospect on the previous sprint and identify areas for improvement

- ☒ c) To showcase completed work to stakeholders and gather feedback

- d) To conduct a final code review before deployment

**16. What is the purpose of a "Use Case Diagram" in the Unified Modeling Language (UML)?**

- a) To describe the interactions between system components

- ☒ b) To specify how a system interacts with external entities or actors

- c) To represent the flow of data within a system

- d) To visualize the relationships between classes in a system

**17. What is the main goal of User Experience (UX) design?**

- a) Creating visually appealing interfaces

- ☒ b) Improving the overall usability and satisfaction of the user

- c) Maximizing profits for the company

- d) Minimizing the number of features in an application

**18. What does the term "affordance" refer to in the context of design?**

- a) The visual appeal of an interface

- b) The responsiveness of an application

- ☒ c) Perceived action possibilities of an object based on its visual cues

- d) The speed at which a user can complete a task

Good Luck

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