

Department of Higher Education
University of Computer Studies, Yangon
Fourth Year (B.C.Sc.)
Final Examination
Unified Modeling Language (CS-405)
October, 2018

Answer All Questions.

Time Allowed: 3 Hours

I. Choose the correct answer from the followings. **(20 Marks)**

1. The vertical dimension of a sequence diagram represents
A. time B. objects C. lines D. messages
2. A _____ models the interaction of the information system with its end-users and other external systems.
A. Use case diagram B. Class diagram
C. Package diagram D. Database diagram
3. A constructor operation does which of the following?
A. Creates a new instance of a class B. Updates an existing instance of a class
C. Deletes an existing instance of a class D. All of the above
4. The horizontal dimension of a sequence diagram represents
A. time B. objects C. lines D. messages
5. A dependency between the source file and the package is-----.
A. import B. include C. implement D. friend
6. Constructor operations are ----- scope of UML.
A. instance B. class C. component D. value
7. Interaction Diagram is a combined term for
A. Sequence Diagram + Collaboration Diagram
B. Activity Diagram + State Chart Diagram
C. Deployment Diagram + Collaboration Diagram
D. None of the mentioned
8. What are the different interaction diagram notations does UML have?
A. A sequence diagram B. A communication diagram
C. An interaction overview diagram D. All of the mentioned
9. Weak entities are represented in UML diagrams by using aggregations called
A. qualified segregation B. non-qualified segregation
C. non-qualified aggregation D. qualified aggregation
10. Which of the following techniques and notations would you find with UML?
A. Use cases B. Class diagrams C. State diagrams D. All of the above
11. Which of the following is an example of a guard condition?
A. [date<due date] B. /date<due date/ C. *date<due date* D. /date^due date

12. Use case descriptions consist of interaction among which of the following?
A. Product B. Use case C. Actor D. Product and Use case
13. A UML diagram includes which of the following?
A. Class name B. List of attributes C. List of operations D. All of the above
14. Components can be represented by which of the following?
A. Component symbols B. Stereotypes
C. Rectangle boxes D. Component symbols and Stereo types
15. If you want to plan project activities such as developing new functionalities or test cases, which of the following OOAD artifacts is the most useful?
A. Sequence diagrams B. Use cases C. Domain Model D. Package diagrams
16. Multiplicity information should be shown on-----.
A. generalization B. Association C. dependency D. Specialization
17. _____ specify the response of an object to an event.
A. conditions B. actions C. roles D. guards
18. The MVC architecture distinguishes objects to control object complex interaction, they are called-----.
A. messages B. controllers C. mappers D. Observers
19. Typical inputs to the analysis activity are the use case and -----models.
A. object B. class C. domain D. input
20. A dependency between source file and the package is-----
A. import B. friend C. implement D. bind

II. Write the short notes on the difference between **any three** of the following pairs.

(15 Marks)

- (a) Attribute Multiplicity and Class Multiplicity
- (b) Component diagram and Deployment diagram
- (c) Unary relationship and Binary relationship
- (d) Composite state and History state
- (e) Polling and Observer pattern

III. (a) Draw a UML **use case diagram** and **class diagram** for the following university car parking system. **(20 Marks)**

A university wishes to increase security in its car park. It has been decided to issue an identity card to all employees. The card record the employee's name, department and identity number. A barrier, a card reader and a sensor are placed at the entrance of the car park. The driver inserts the numbered card into the card reader. The card reader checks the card number. If the number is valid, the reader sends a signal to raise the barrier and the vehicle can enter the car park. The sensor sends a signal to the barrier to lower when the vehicle is entered. There is a system at the exit with a barrier which is raised when the car wishes to leave the car park. When there are no spaces in the car park a sign at the entrance displays "Full" and is only switched off when a vehicle leaves. Special visitor's cards, which record a number and the current date, also

permit access to the car park. Visitor's cards may be sent out an advance or collected from reception. All visitors' cards must be returned to the reception when the visitor leaves the site so that they can be deleted from the list of valid cards.

- (b) Draw the **object diagram** that is an instance of the class diagram you have drawn for above question III.(a) with appropriate links between objects. **(5 Marks)**

IV. Assume that you have to develop a computer system for a university library. The library contains books and each book may have several copies. Only members of the library may borrow books. The system checks whether the potential borrower is a member of the library and whether there is a reservation on the book. If book check succeed the system records that the book is on loan. Otherwise it refuses the loan. A library member may ask to extend the loan of the book. The system that checks whether there is a reservation on the book. If so, the system refuses to extend the loan. Otherwise it records the extension of the loan.

Draw a **Sequence Diagram** and a **Collaboration Diagram** that shows scenario of the use case Borrow copy of book in which the user is permitted to borrow the books and the system records that the book is on loan. **(20 Marks)**

- V. (a) What is a component diagram and discuss the dependency relationships among components. **(10 Marks)**
- (b) Draw the state diagram for the following marital statuses of human life starting from birth to death and possible states are never married, married, divorced, widowed states. In your diagram, you have to consider the event, transition, guard conditions completely. **(10 Marks)**