

Object Oriented Software Engineering ( End Term - Dec 2008)

Note : Attempt all questions. Q1 is compulsory. Internal choice is indicated.

Q1. Answer all questions (5\*4=20)

- a) Suggest some heuristics for identifying objects during object oriented analysis of problem.
- b) How is Object oriented testing different than procedural testing?
- c) Discuss the role of Use Case model in object oriented requirement analysis.
- d) what is a CRC card? How it helps in the development of Object Oriented System?
- e) Write about features of UML system.

Q2.

- a) Compare and contrast various software development models in tabular form. State the advantage and disadvantage of each model. (5)
- b) List out Requirements Elicitation Techniques. Which one is most popular and why? (5)

OR

Q3.

- a) Discuss the object oriented software development life cycle. (5)
- b) What do you understand by the term Requirement Elicitation? Discuss any two techniques in detail. (5)

Q4.

- a) How is Object Orientation different from classical procedural software design? Briefly discuss different aspects of Booch's methodology for object oriented design. (5)
- b) How Object Model, Dynamic Model and Functional Model are related to each other? (5)

OR

Q5.

- a) The identification of classes and objects is the hardest part of object oriented analysis and design. Discuss with the help of an example. (5)
- b) "The goal if analysis model is to develop a model of what the system will do." Explain the statement with the help of the steps that an analyst will follow throughout the analysis. (5)

Q6.

- a) Define the following (6)  
I) Magic State                      II) Guard                      III) A minimal state machine
- b) Why should begin with the object oriented analysis and object oriented design (4)

OR

Q7.

- a) What are the limitations of State Transition Table? How are they overcome? (5)
- b) Explain unit and integration testing in the object oriented context. Differentiate between thread based and use case based strategies for integration testing. (5)

Q8.

Consider the following Library Management System(LIS) :

- The Librarian can create new member records by entering the member's name and address. LIS assigns a unique membership number to each new library member. The Librarian can also delete a membership by entering the membership number.
- LIS registers each book issued to a member. When a member returns a book, LIS deletes the book from the member's account and make the book available for future issue.
- When a member returns an overdue book, LIS software computes the penalty charge and prints a bill towards the fine payable by the member.
- A member can input either the name of a book or the name of the author of the book and query about the availability of the book. If available, LIS displays the following :
  - rack number in which book is located,
  - the number of copies of books available for issue
  - number of copies of books already issued

Perform the following. You can make suitable assumptions regarding the details of various features of LIS software but you must clearly write down the assumptions you make.

- a) Draw the use case diagram and give the use case description of issue and return of books. (5)
- b) For implementing the LIS software identify the classes and their interrelationships and represent them in class diagram. (5)

OR

Q9.

a) Draw Sequence Diagram for Cash Withdrawal from ATM Machine. (5)

b) A product is to be installed to control  $n$  elevators in a building with  $m$  floors. The problem concerns the logic required to move the elevators between the floors according to the following constraints:

- I) Each elevator has a set of  $m$  buttons one for each floor. These illuminate when pressed and cause the elevator to visit the corresponding floor. The illumination is canceled when the elevator visits the corresponding floor.
- II) Each floor except the first floor and top floor has two buttons, one to request an up elevator and other to request a down elevator. These buttons illuminate when pressed. The illumination is canceled when an elevator visits the floor and then moves in the desired direction.

III) When an elevator has no request, it remains at current floor with its door closed.  
Given this problem description, identify classes and draw class diagram to show the relationship among the classes. You can make suitable assumptions regarding the details of various features of Elevator but you must clearly write down the assumptions you make. (5)