

**III B.Tech. I Semester Supplementary Examinations, May -2005
OBJECT ORIENTED ANALYSIS AND DESIGN THROUGH UML
(Common to Computer Science & Engineering and Information
Technology)**

Time: 3 hours

Max Marks: 80

**Answer any FIVE Questions
All Questions carry equal marks**

1. (a) What are the essential features of object oriented paradigm? Explain briefly.
(b) What do you understand by the structure of complex system.
(c) How do you design a complex system?
2. Define the following:
 - (a) use case driven
 - (b) architecture centric
 - (c) iterative process
 - (d) Incremental process
 - (e) stakeholder
 - (f) artifact
 - (g) usecase
 - (h) Active class.
3. Explain the eight stereotypes that apply to dependency relationships among classes and objects in class diagrams.
4. (a) Enumerate the steps to model simple collaborations.
(b) Describe forward engineering and reverse engineering.
(c) The cellular network must place the phone call correctly, and also schedule the receiving and conference calls. Draw a class diagram.
5. (a) What are interaction diagrams? What are their contents and common properties? Define semantic equivalence between two kinds of interaction diagrams.
(b) Enumerate the steps to model flows of control by time ordering.
6. (a) Explain the following standard stereotypes that adorn the ends of links.
 - i. association
 - ii. self
 - iii. global
 - iv. local
 - v. parameter.

- (b) Briefly write about messages and sequencing with an illustrative diagram.
- 7. (a) Enumerate the steps to model the following:
 - i. family of signals
 - ii. exceptions
- (b) Explain the four kinds of events modeled by UML.
- 8. (a) Enumerate the steps to model adaptable systems. Illustrate with a UML diagram.
- (b) Enumerate the steps to model an executable release. Illustrate with a UML diagram.
- (c) What are the common uses of component diagrams?

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1. (a) How are classes and objects related?
(b) Does inheritance break encapsulation? Justify your answer.
(c) Is abstraction possible without object orientation? Illustrate with example.
(d) Explain how complex systems are to be designed?
2. (a) Explain briefly about usecase, sequence, component and deployment diagrams.
(b) Explain the UML approach to SDLC.
3. (a) Explain any three features used in creating abstractions.
(b) Enumerate the steps to model the vocabulary of a system.
(c) Write a simple JAVA applet for printing "Hello, World!" in a web browser.
4. (a) Enumerate the steps to model simple collaborations. Give an example class diagram.
(b) What are the contents in class diagram?
5. (a) Enumerate the steps to model flows of control by time ordering.
(b) Draw a sequence diagram that specifies the flow of control involved in initiating a simple, two-party phone call.
6. (a) Draw a use case diagram to model the behavior of a cellular phone. Explain briefly.
(b) What are the contexts, common properties and common uses of use case diagrams.
(c) Enumerate the steps to model the context of a system.
7. (a) Enumerate the steps to model the lifetime of an object.
(b) Compare: substates, nested states, composite state.
8. (a) Enumerate the steps to forward engineer and reverse engineer a component diagram.
(b) Enumerate the steps to reverse engineer a deployment diagram.
(c) Enumerate the steps to model a physical database schema.

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1. (a) Contrast object model with data model.
(b) Consider two classes with same data members and methods. How could they be different? Explain briefly.
(c) How is object orientation distinguished from conventional programming?
(d) Contrast object with class.
2. Briefly explain the following with UML notation wherever applicable.
 - (a) Abstraction
 - (b) Inheritance
 - (c) Runtime Polymorphism
 - (d) encapsulation
 - (e) Realization
 - (f) Liskov's substitution principle
 - (g) Using relationship.
3. Briefly explain any twelve stereotypes that may be applied to dependency relationships.
4. (a) Illustrate the following modeling issues with class diagrams.
 - i. Modeling simple collaborations
 - ii. Modeling logical database schema.(b) What are the contents in class diagrams?
5. (a) Enumerate the steps to model flows of control by organization.
(b) Explain forward engineering and reverse engineering in respect of interaction diagrams.
6. (a) Define interaction. What is the significance of context in interactions?
(b) What are the various adornments to ends of links denoted as standard stereotypes? Explain about objects and roles.
7. (a) Define event and signal. What are the four kinds of events which can be modeled by UML? Explain briefly.

- (b) Enumerate the steps to model a family of signals.
- 8. (a) Enumerate the steps to model source code. Illustrate with a diagram in UML notation.
- (b) Enumerate the steps to model an executable release. Illustrate with a UML diagram.

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1. (a) Define: object, class, interface, component, UML.
(b) Explain the significance of the protected, public and private access specifiers briefly.
(c) Contrast: object oriented Vs. object based.
2. (a) Why is it necessary to have a variety of diagrams in a model of a system?
(b) Which UML diagrams give a static view and which give a dynamic view of a system?
(c) Consider a computer-based system that plays chess with a user. Which UML diagrams would be helpful in designing the system? Why?
(d) Contrast the following:
 - i. Actors Vs. Stakeholders
 - ii. Usecase Vs. Algorithm.
3. (a) Enumerate the steps to model the distribution of responsibilities in a system.
(b) Enumerate the steps to model non-software things.
(c) Enumerate the steps to model primitive types.
4. (a) Enumerate the steps to forward engineer a class diagram.
(b) Enumerate the steps to reverse engineer a class diagram.
(c) What are forward engineering and reverse engineering?
5. (a) Draw a sequence diagram that shows how a GUI interacts with other objects. Explain.
(b) Explain the features of both the kinds of interaction diagrams and compare and contrast them.
6. (a) Define use case. What are the uses of use cases?
(b) Define actor. Illustrate actor specialization and use case specialization giving UML notation.
(c) Describe the use case “Validate user” in modeling an ATM system.
7. (a) Give the sketch of a state machine for the controller in a home security system, which is responsible for monitoring various sensors around the perimeter of the house. Briefly explain.

- (b) Explain the following parts of a transition
 - i. Event trigger.
 - ii. Guard condition.
- 8. (a) What are the properties of a well-structured component diagram?
- (b) What are the contents, common properties and common uses of component diagrams? Explain briefly.

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