

III B.Tech I Semester Regular Examinations, November 2006
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) Contrast: data model Vs. object model.
(b) Consider any three object oriented programming languages. Enumerate any six contrasting features comparatively.
(c) What are the basic features of object orientation? Explain briefly. [5+6+5]
2. (a) What are the aims of modeling? What are the principles of modeling.
(b) What are the application areas of UML? Give any five.
(c) What is software architecture? Define stakeholder. [8+5+3]
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. [6+6+4]
4. (a) Enumerate the steps to model simple collaborations.
(b) Enumerate the steps to model object structures. [6+10]
5. (a) How is recursion represented in a sequence diagram?
(b) Explain the following with regard to interaction diagrams.
 - i. Object life line
 - ii. <<create>> and <<destroy>> messages
 - iii. Focus of control
 - iv. Dewey decimal numbering
 - v. Nesting of tours of control
 - vi. Semantic equivalence. [4+12]
6. (a) What are sequencing and delegation? How is nested flow of control rendered in UML notation? Illustrate.
(b) "C++ is statically typed where as Small talk is dynamically typed." Justify the validity or invalidity of the statement, whatever is appropriate.
(c) Enumerate the steps to model a flow of control. [7+3+6]
7. (a) What are the possible combinations of interaction considered in a system with both active and passive objects.

- (b) What are the two standard stereotypes that apply to active classes? Differentiate them.
- (c) Enumerate the steps to model the following:
 - i. family of signals
 - ii. exceptions. [6+4+6]
- 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? [6+8+2]

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1. (a) What are the key features in object oriented programming systems? Explain briefly.
(b) Contrast: object based Vs. object oriented
(c) Contrast: object model Vs. data model
(d) Contrast: interface Vs. component Vs. class [8+2+4+2]
2. (a) Define polymorphism. What are the various polymorphism schemes? Explain them briefly.
(b) Define UML. What is round-trip engineering?
(c) Briefly explain the following:
 - i. collaboration
 - ii. use case
 - iii. component
 - iv. active class. [6+4+6]
3. (a) What are the five constraints applied to association relationships? Give a brief.
(b) What are the visibility specifiers used for classes and packages? Explain. [10+6]
4. (a) The cellular network must place the phone call correctly, and also schedule the receiving and conference calls. Draw a class diagram.
(b) What are the common properties, uses and contents of object diagrams? Enumerate on similar lines for class diagrams. [8+8]
5. (a) Draw a sequence diagrams that specifies the flow of control involved in initiating a simple, two-party phone call.
(b) Draw a collaboration diagram that specifies the flow of control involved in registering a new student at a school. [8+8]
6. (a) Define interaction. Briefly explain about links in interactions.
(b) Enumerate the steps to model flow of control in interactions.
(c) Briefly explain about use cases. Enumerate the steps to model the behavior of an element. [5+5+6]

7. (a) What are the characteristics of a well-structured state machine?
(b) Compare and contrast: active object Vs. thread Vs. process.
(c) Enumerate the steps to model multiple flows of control. [5+5+6]
8. (a) Enumerate the steps to forward engineer and to reverse engineer a component diagram
(b) Enumerate the steps to model the following:
 - i. Executable release
 - ii. Physical database. [9+7]

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(b) Contrast: object based Vs. object oriented
(c) Contrast: object model Vs. data model
(d) Contrast: interface Vs. component Vs. class [8+2+4+2]
2. (a) Define object identity. What is oid uniqueness principle?
(b) What is model? What are the aims of modeling?
(c) What are the principles of modeling?
(d) What is UML? Define. [5+5+4+2]
3. (a) Define the following:
 i. System
 ii. Model
 iii. subsystem
 iv. Use case
(b) How are system architecture views and UML diagrams related?
(c) How do you model different levels of abstraction. [8+4+4]
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? [8+6+2]
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. [8+8]
6. (a) Draw a use case diagram that depicts the context of a credit card validation system. Explain briefly.
(b) Draw the UML diagram to model the requirements of a system.
(c) What is the significance of use cases and collaborations. [8+4+4]
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. [13+3]
8. (a) Enumerate the steps to model adaptable systems. Illustrate with a UML diagram.
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- (c) What are the common uses of component diagrams? [6+8+2]

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1. (a) Contrast object with class.
(b) Given a problem description, how are objects and classes identified?
(c) Define: object, class, interface, component, UML. [3+4+9]
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. [4x4=16]
3. (a) Define relationship. Explain the four adornments that apply to an association.
(b) Enumerate the steps to model single inheritance.
(c) Enumerate the steps to model using relationship. [8+6+2]
4. (a) Enumerate the steps to model simple collaborations. Illustrate with an example class diagram.
(b) With reference to class diagrams, what are the contents and common uses? [12+4]
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. [8+8]
6. (a) Explain the various relationships possible among use cases. Illustrate in UML notation.
(b) Enumerate the steps to model the behavior of an element.
(c) Explain use case model briefly. [9+5+2]
7. (a) Contrast action with activity. Define state and event. What are the various parts of a state? Explain briefly.
(b) Define signal. [14+2]

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? [6+8+2]
