

II B.Tech I Semester Regular Examinations, November 2006
OBJECT ORIENTED ANALYSIS DESIGN THROUGH UML
(Aeronautical Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Explain the UML approach to software architecture.
(b) Why is UML used? Explain the various relationships with UML notation. [10+6]
2. Explain the eight stereotypes that apply to dependency relationships among classes and objects in class diagrams. [16]
3. (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? [12+4]
4. (a) What is sequence diagram? What is collaboration diagram? What are the features in each one?
(b) What are the properties and common uses of sequence diagrams and collaboration diagrams? [10+6]
5. (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]
6. (a) Explain the following parts of a transition.
 - i. source state
 - ii. event trigger
 - iii. guard condition
 - iv. target state
 - v. action.(b) Define state machine. [15+1]
7. (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]

8. (a) Change the design of the database package so a relational database is used instead of the current file solution. Draw the class diagram. Do not change the interface to the persistent class. [8]
- (b) Improve the performance of the database by adding support for reusing deleted records in a file, and support for an index file where a more efficient search for a specific object can be done. Draw activity diagram [8]

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1. Define the following:
 - (a) software architecture
 - (b) Active class and its UML notation
 - (c) Usecase and its UML notation
 - (d) Liskov's substitution principle
 - (e) Using relationship
 - (f) Runtime polymorphism
 - (g) UML
 - (h) Role. [16]
2.
 - (a) Explain the UML's behavior diagrams.
 - (b) Briefly explain the following relationships with UML notation
 - i. Using
 - ii. Realization
 - iii. Simple aggregation
 - iv. Composite aggregation
 - (c) Contrast is-a relationship with has-a relationship. [6+8+2]
3.
 - (a) Enumerate the steps to model logical database schema.
 - (b) Draw a class diagram for a school information system.
 - (c) What is object diagram? [6+8+2]
4.
 - (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]
5. (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. [10+6]
6. (a) Enumerate the steps to model interprocess communication (IPC).
(b) Draw a UML diagram which models IPC in a distributed reservation system with processes spread across four nodes. Briefly explain.
(c) What are the characteristics of a well-structured active class and active object? [4+8+4]
7. (a) What are the characteristics of the following:
 i. Well-structured deployment diagram
 ii. Well-structured component diagram.
(b) Enumerate the steps to reverse engineer a deployment diagram.
(c) What are the common uses of deployment diagrams? [8+5+3]
8. (a) Write a Java program for the Loan class [8]
(b) Draw a deployment diagram for the library system [3]
(c) Draw activity diagram to inform a person when a loan is due [5]

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1. (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]
2. (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]
3. (a) Enumerate the steps to model simple collaborations.
(b) Enumerate the steps to model logical database schema.
(c) What is class diagram? [6+8+2]
4. (a) Explain briefly about sequence diagrams and collaboration diagrams. What are the contrasting features between the two?
(b) Briefly explain the forward engineering and reverse engineering of interaction diagrams. [10+6]
5. (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. [6+6+4]
6. (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]
7. (a) Enumerate the steps to model an executable release.
(b) What are the contents, common properties and common uses of component diagrams? Explain briefly. [4+12]
8. (a) For coding, the specifications are fetched from which diagrams in the design model? explain [6]
(b) What are the packages in the Library system? explain [10]

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1. (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]
2. Briefly explain any twelve stereotypes that may be applied to dependency relationships. [16]
3. (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? [12+4]
4. (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]
5. (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. [10+6]
6. (a) What are the possible combinations of interaction considered in a system with both active and passive objects?
(b) What is the UML approach to process synchronization?
(c) Enumerate the steps to model multiple flows of control. [6+4+6]
7. (a) Enumerate the steps to model the following:
 - i. Embedded system
 - ii. Fully distributed system
 - iii. client/sever system.

- (b) What are the contents, common properties and common uses of deployment diagrams. [13+3]
8. (a) Change the design of the database package so a relational database is used instead of the current file solution. Draw the class diagram. Do not change the interface to the persistent class. [8]
- (b) Improve the performance of the database by adding support for reusing deleted records in a file, and support for an index file where a more efficient search for a specific object can be done. Draw activity diagram [8]

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