POKHARA UNIVERSITY

Level: Bachelor Semester – Spring Year : 2005
Programme: BE Full Marks : 100
Course: Object Oriented Software Engineering Time : 3hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) Explain the evolutionary life cycle models and waterfall life cycle mode. Explain why evolutionary process models are likely to dominate the software development process as project time lines become shorter. (Draw diagram to explain) 9
   b) What do you mean by 4 P's in software project management? 6
2. a) How do you perform the software project cost estimation using Functional Point method? Explain. 8
   b) What is risk analysis and risk management? Explain about Risk Mitigation Monitoring and Management. 7
3. a) What is software reliability? How you measure software reliability? Is there any different between software reliability and software safety? 7
   b) Do you think formal technical review is necessary in software development? Justify your answer with suitable example. 8
4. a) What do you mean by system modelling? Give the details of process specifications and control specifications in a software project. 8
   b) What is integration testing? Explain the different types of system integration testing. 7
5. a) Explain the terms encapsulation, Multiple inheritance and polymorphism with example. 7
   b) How do you identify object, class and object relationship in a system? Mention the general guidelines. 8
6. a) What is Class Responsibility Collaborator Model? How do you develop CRC model? Explain with example. 7
   b) Briefly explain about task management, resource management and data management components. 8
7. Write short notes on (**Any Two**): 2x5
   a) Feasibility analysis
   b) State Transition Diagram
   c) Collaboration diagram

POKHARA UNIVERSITY

Level: Bachelor Semester – Spring Year : 2006
Programme: BE Full Marks: 100
Course: Object Oriented Design and Modeling through UML Time : 3hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) Explain the basic concept of object oriented analysis and design. 8

   b) Why requirement capture is difficult in most of the software development projects? Explain the type of requirements. 7

2. a) What is a Use Case? Illustrate the difference between the types of the expanded format Use Cases with suitable example. 2+6

   b) What are different diagram used in UML? Illustrate any two. 2+5

3. a) How do you make a conceptual model? Illustrate. 7

   b) What are the different sections of a contract? 8

4. a) Define collaboration diagram with suitable example. Illustrate the use of mutually exclusive conditional path in collaboration diagram. 2+4

   b) What are patterns? Explain expert and creator patterns. 1+8

5. a) Define visibility. List its types. Illustrate parameter visibility with an example (in both the collaboration diagram and code). 9

   b) When mapping design to code changes occur. Justify. 6

6. Case Study: Read the following case study: 15

   You are developing a system to handle checkout duties at a library. Library members may checkout books and videos from the library. The system must keep track of which books and videos each member currently has checked out.

   Each book and video has a unique item number that is used by the system to index that book or video, a clerk may check the status of a book (in the library, checked out, checked out and overdue) by supplying the item number. A clerk may also check either on a book by supplying the title and author or on a video by supplying only the title.

   Each library member has a library card that includes his or her membership number and the item number of the book or videos (in total),

and if the borrower has no overdue books or videos, the book or video is loaned to the borrower. The conditions of the loan include a due date (two weeks for books and three days for videotapes.).

For the above case study:

a) List use cases and prepare use case diagram.

b) Identify conceptual classes, and prepare a domain model.

c) Create a sequence diagram when a library member wants to borrow a book or videotape.

7. Write short notes on (**Any Two**): 5×2

a) System sequence diagram

b) Exceptions and error Handling

c) Multiplicity

d) Package diagram

POKHARA UNIVERSITY

Level: Bachelor Semester – Spring Year : 2007
Programme: BE Full Marks: 100
Course: Object Oriented Design & Modeling through UML Time : 3hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) What do you mean by Object Oriented Analysis and Design? Write down the merits of using UML. 8

   b) Why do we need to develop use case models for a system under development? Illustrate and define all the necessary components of a Use Case diagram with a system boundary with an example. 7

2. a) What are concepts? How they are different from classes? With suitable example list the steps to make a Conceptual Model. 10

   b) Distinguish between Primary, Secondary and Optional Use Cases. 5

3. a) Illustrate the use of mutually exclusive conditional path in collaboration diagram. 5

   b) Illustrate the role of a Contract in devising a collaboration diagram? Show the details of a contract with all its necessary sections taking an example into consideration? 10

4. a) What are the GRASP (General Responsibility Assignment Software Pattern) pattern? Explain with suitable example, how you can apply the Expert Pattern during design stage. 7

   b) Define visibility. List its types. Illustrate parameter visibility with an example (in both the collaboration diagram and code). 8

5. a) What is mapping Design to Code? Illustrate creating of class definition from a design class diagram with an example. 7

   b) What is collaboration diagram? Illustrate how methods are created from collaboration diagram taking an example into consideration. 8

6. a) Case study: 10

   Consider the following scenario for patient's service in a hospital.

   The patient's details (patient ID, appointment date, doctor name) are entered in the system by the hospital clerk. The doctor checks the patient

and enters the findings of each check-up in the system and recommends medicines for the patients. The patient gets the medicine and pays for it.

Now answer the following questions:

i) Identify all the Use - Cases and actors and draw Use - Case diagrams for the above scenario.

ii) Write the expanded format Use Case for any one of the Use Case

b) Explain a system sequence diagram with an example. 5

7. Write short notes on ***(Any Two):*** 2×5

a) Three Tier Architecture

b) Real and Essential Use Cases

c) System Functions

d) Exception and error handling

POKHARA UNIVERSITY

Level: Bachelor | Semester – Spring | Year : 2008
Programme: BE | Full Marks: 100
Course: Object Oriented Software Engineering | Time : 3hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) What is the significance of Software Engineering over the system design? Describe its relationship with other computer science areas. 8

   b) Compare RAD model, prototype model, and spiral model. List out their advantages and disadvantages. 7

2. a) Why is it necessary to measure software? Explain with a suitable example. What are the techniques that can be used to measure the software? 7

   b) Describe the project estimation process. Explain in detail the LOC and FP approach. 8

3. a) What is FTR? What are the important guidelines for conducting FTR? 7

   b) What are Software Quality Controls and Software Quality Assurance? What points must be focused to produce high quality software products in context of Nepal? 8

4. a) Read the following problem statement. 10

Case Study: Course Registration System

At the beginning of each semester students may request a course catalog containing a list of each course offerings for the semester. Information about each course, such as professor, department, and prerequisites will be included to help students for prompt decisions.

The system will allow students to select four courses that are going to be offered for the coming semester. In addition, each student will indicate two alternative choices in case a course offering becomes filled or cancelled. No course offerings will have more than ten students or fewer than three students. A course offering with fewer than three students will be cancelled. Once the registration process is completed for a student, the registration system sends information to the billing system so the student

can be billed for the semester.

Professors must be able to access the online system to indicate which courses they will be teaching, and to see which students signed up for their course offerings.

Now answer the following questions

i. Identify conceptual classes, and prepare a domain model.

ii. Create a use case model for given description.

b) Why object oriented programming is known as bottom up approach? 5

5. a) How is Black Box Testing different from White Box Testing. Describe in brief the Unit testing. 8

b) What do you mean by design pattern? When it is used? Write the format to specify the design patterns. 7

6. a) What is UML diagram? List out all UML diagrams. Explain class diagram, collaboration diagram, and sequence diagram with a suitable example. 8

b) Describe the state transition diagram with an appropriate example. 7

7. Write short notes on ***(Any Two)*** 2×5

a) 4 P's in Project Management

b) Encapsulation, inheritance and Polymorphism

c) RMMM

POKHARA UNIVERSITY

Level: Bachelor Semester – Fall Year : 2009
Programme: B.E. Full Marks : 100
Course: Object Oriented Design and Modeling through UML Time : 3hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) What do you mean by Object Oriented Analysis and Design? What is the need of UML during objects oriented analysis and design? 8

   b) "Iterative method focuses on adaptive software development". Justify. 7

2. a) Why is use case model used during analysis? Explain the different formats of use cases. 8

   b) When is it necessary to prepare contracts? State the guidelines for preparing a contract? 7

3. a) What is behavioural modelling? Explain importance of system behaviours in system development. 8

   b) What are the GRASP patterns? Explain with an example how you apply the Expert pattern during object design. 7

4. a) What is the significant of using interaction diagram during design? Compare and contrast sequence diagram and collaboration diagram in terms of their strengths and weakness. 8

   b) "Classes collaborate with each other to fulfil their responsibilities." Defend your answer. 7

5. a) How do you utilize the information given by interaction diagram during mapping design to code. 8

   b) What do you mean by fault, error and failure? How are expectations addressed by UML? 7

6. Case Study: Flush Game 5x3

   Consider an online flush game in which minimum of two players and maximum of fifteen players can play at a time. The decks and colours are as usual.

   a) Identify the classes and draw the class diagram in the scenario.

b) Use the above class diagram to create the general definition of the classes for coding.

c) Discuss the general problem that might occur while mapping the class design into the code.

7. Write short notes on: **(Any Two)** 5x2

   a) Visibility Scopes between Objects

   b) Elaboration of Use Cases

   c) Connecting the UI layer to Domain layer.

POKHARA UNIVERSITY

Level: Bachelor | Semester – Fall | Year : 2010
Programme: BE | Full Marks : 100
Pass Marks: 45
Course: Object Oriented Software Engineering | Time : 3hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) Define software engineering and its role over the system design. Describe the relationship with other computer science area. 8

   b) What are software process models? Describe the software process model based on the spiral model. 7

2. a) Discuss the role of 4 P's for project management. 5

   b) What are the different steps of project scheduling process? 4

   c) Explain the LOC and FP approach for software cost estimation. 6

3. a) What types of risks are likely to encounter as the software is build? How do you access to consequences of those risks? 7

   b) What is meant by software review? Describe the different methods of conducting software review. 8

4. a) For the case study mentioned below produce level 1DFD: 8

Processing warranty registration cards

- Inspect the Warranty Registration Card received from the customer to ensure that the information is complete and accurate. Incomplete cards are placed in a reject box.
- Data entry operators key the Warranty Registration Card, thus creating a Warranty Registration file.
- A different data entry operator verifies the keyed data by re-entering the Warranty Registration Card information. The data entry terminal compares the data previously keyed with the entry made by the second operator. Discrepancies are displayed.
- The Warranty Registration File is input to a batch edit program. Each record is checked for accuracy. Errors are printed on a Warranty Validation Report, and valid records are placed on a valid Warranty Registration File.
- The Valid Warranty Registration File is used as input, along with the Customer Master File, into the Customer Warranty Update Program. Records are added or updated, depending on whether the customer exists on the Customer Master File.
- The Valid Warranty Registration file is used to print a series of mailing labels for sending (by mail) the font software to the customer.

   b) How is software testing different from system testing? Explain about unit testing and integration testing in detail. 7

5. a) Draw a State Transition diagram. Make assumption if needed. 8

Life cycle of GUI Window

There are three states, *Minimized* state, where window takes the minimal

space on screen *Restored* state, where it takes a portion of a screen and *Maximized* state, where it occupies entire screen. When the window is opened at first using the *Open* event or operation, it enters *Restored* state and a window is destroyed using close event when it may be in any state. Also whenever window is in the *Minimized* or *Maximized* state, it will be changed to the *Restored* state after receiving a *Restore* event. Every time a window is being restored or maximized it performs a *redraw* action to render itself.

b) Define Unified Modelling Language. Explain Use Case Diagram with an appropriate example. 7

6. a) Define CRC with a sample example. What are the benefits of using CRC in any software project? 8

b) What are the issues to be considered for Object Oriented Design? How does a design pattern help in software development process? 7

7. Write short notes on: **(Any Two)** 5x2

a) Concurrency and subsystem allocation
b) Encapsulation, Inheritance and Polymorphism
c) Outsourcing

POKHARA UNIVERSITY

Level: Bachelor | Semester – Fall | Year : 2011
Programme: BE | Full Marks: 100
Course: Object Oriented Design and Modelling through UML | Pass Marks: 45 | Time : 3hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) How Iterative development differ from Waterfall model? Describe Iterative development with a suitable example and state its benefit of implementation. 3+4

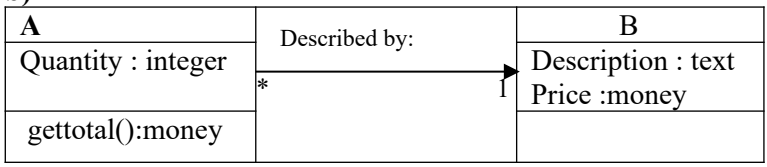
   b) State the importance of UML. List out all possible UML diagrams and arrange it in accordance to structure diagram, behaviour diagram and interaction diagram. State the differences between use case diagrams and system sequential. 3+2+3

2. a) **A Case study** 8

A person wants to drink cold drinks. So he goes to automatic cold drinks seller machine. He presses the menu to choose a cold drinks and the amount. Then he inserts the coin as per needed and press the cold drinks number. The needed cold drink comes out. The paid receipt with the cold drinks name comes out. Then the man can drink cold drink.

i. Draw the use – case diagram of given scenario.
ii. Draw the domain model.

b) 7



Create a class definition from above class diagram.

3. a) What is the main objective of constructing a Domain Model? How do you construct the Domain Model? Explain with example. 8

   b) What do you mean by system behavior? List its types. Explain the guidelines for preparing a contract. 7

4. a) How the following terms are represented in sequence diagram. 8

i. Conditional message

ii. Mutually exclusive conditional messages

iii. Iteration for a single message

iv. Messages to self

b) Define visibility with a suitable example. List out its types and define any two with suitable example? 3+4

5. a) What information are included in design class diagram? What are the differences between domain model and design class design? 8

b) What do you mean by programming and development process? Define the construct phase. 3+4

6. a) What are the basic steps involved in the process of Mapping Designs to codes? Illustrate how the simple and reference attributes are mapped to the Class definition in any one of the object oriented programming languages you know. 10

b) Explain the concepts of exceptions and error handing with suitable example. 5

7. Write short notes on **any two:** 2×5

a) Thinking in objects

b) Association

c) Collaboration diagram

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POKHARA UNIVERSITY

Level: Bachelor Semester – Fall Year : 2012
Programme: BE Full Marks: 100
Course: Object Oriented Design and Modelling through UML Pass Marks: 45
Time : 3hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1.	a)	What are various notations provided by the UML for capturing the static and dynamic aspects of a software system? Explain with figures.	7
	b)	Explain how the change in requirements is handled on an iterative development. List out the advantage of an iterative and incremental process of software development over waterfall development process.	8
2.	a)	What is the basic procedure to find out the use cases? List benefits of writing use cases during software development process?	5
	b)	Explain when the changes occur in mapping design to code.	5
	c)	How do we assign responsibilities to objects? Explain with a suitable example.	5
3.	a)	What are various relationships that might exist between different domain elements? Explain using a Patient billing system as an example.	8
	b)	What are the important contents of a Post condition of an operation contract? How is mapping of these operation contracts done during Object Oriented design phase?	7
		OR	
		Define role of multiplicity and non primitive types with suitable examples.	7
4.	a)	What is the significance of using interaction diagram during design? Compare and contrast system sequence diagram and collaboration diagram in terms of its weakness and strength.	8
	b)	When is it desirable to use Controller pattern instead of using Information expert pattern when assigning responsibility to objects?	7
5.	a)	What are the conditions for preparing a contract? Does writing	7

contracts leads to domain model updates, defend your answer.

b) Why is it desirable to expect and plan for change and deviation from the design even during programming phase? Explain 8

6. Case Study: Online Hotel Reservation System

When making a reservation a customer must register his /her personal information. To speed up the process details of previous customers will be stored and made available later. By this system the customer can make reservation and cancel it. When making a reservation the customer can choose the number of rooms, the type of room, services (laundry, meal, transportation etc). The reservation is confirmed when customer pay 10% of the total charges. After the reservation, the customer will get an e-mail of the details of the reservation.

Within a hotel there is a reservation administrator who is responsible for controlling reservations at the hotel. He is also responsible for processing no-shows (When the reservation at the hotel doesn't show up at reserved date) and makes a reservation for a customer.

Now answer the following questions:

a) Identify all the use cases and actors and draw a use case diagram. Also write all the course of events for one use case. 8

b) Draw class diagram for the above scenario. 7

7. Write short notes on **any two:** 2×5

a) Visibility

b) Relationship between GRASP and UML

c) High cohesion and low coupling

POKHARA UNIVERSITY

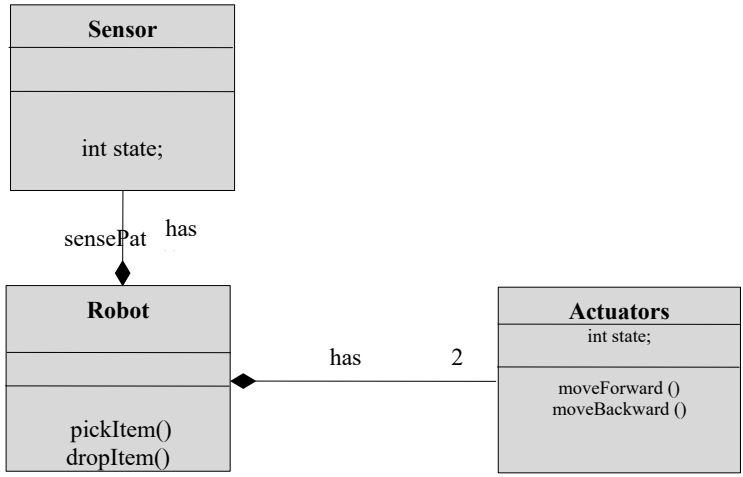
Level: Bachelor Semester: Spring Year : 2012
Programme: BE Full Marks: 100
Course: Object Oriented Design and Modelling Through UML Pass Marks: 45
Time : 3hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1.	a)	Differentiate between state transition diagram and activity diagram, component diagram and deployment diagram with appropriate examples.	8 7
	b)	Describe the importance of Unified Process in OOAD. List out and describe briefly all the phases of Unified Process.	
2.	a)	Define Use Cases. How Use Cases benefits the software development process explain with an example.	7
	b)	Describe the importance of Contract in OOAD. Explain contract in detail for at least one system operation for any kind of example of your own.	8
3.	a)	What are the activities performed during the domain modeling process? How can potential domain elements for a particular scenario be identified?	8
	b)	'Well designed interaction diagram are valuable in object oriented analysis and designed', Justify your answer. Describe the mutually exclusive condition of UML Collaboration diagram.	7
4.	a)	Show with an example how can conditional messages be portrayed in a Collaboration diagram and a Sequence diagram.	7
	b)	What is the difference between knowing and doing responsibilities? How does making use of Design Patterns help in correctly assigning responsibilities to objects?	8
5.	a)	How cohesion and coupling affect good design, explain with a suitable example?	7
	b)	Map the following design to code in any programming language that supports Object Oriented Paradigm	8



6. a) Explain how code can be generated from collaboration diagram and design class diagram. Explain with a suitable example. 8

   b) What do you mean by fault, error and failure? How are exceptions addressed by UML? 7

7. Write short notes on: (Any two) 2×5

   a) Code reuse

   b) Real Use Cases.

   c) Requirements Capture.

POKHARA UNIVERSITY

Level: Bachelor | Semester: Fall | Year : 2013
Programme: BE | Full Marks: 100
Course: Object Oriented Design and Modeling Through UML | Pass Marks: 45 | Time : 3hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) "Good and Precise Requirements leads to good design", justify it. State Expanded Use case with suitable example describing main flow and alternative flow. 8
   b) How are objects perceived in design phase? Explain with suitable example. Distinguish between OOAD and Structural Analysis and Design. 7
2. a) Why do you make a system sequence diagram? Explain all the steps while designing domain model with example? 7
   b) Describe the importance of contract in OOAD. Design is initiated by contract, justify your answer with suitable example. 8
3. a) Define the term visibility and explain different types of visibility between objects? Illustrate with an example. 8
   b) Explain the importance of pattern in design. How do cohesion and coupling effect design? Explain. 7
4. a) Distinguish between class and object, what are the major factors for designing Design Class Diagram (DCD), explain with suitable logic. 8
   b) How does design traces and adjusts the change of requirement during design phase and coding phase? Explain with suitable example and reasoning? 7
5. Library Management System

   System Description:

   This system is a Library management system which controls and grants access to different types of users such as system administrator, head librarian, librarian and members. This system should be able to manage books, loans, late fees, searching of books, should be able to keep members

in a queue for loans. It should be able to generate automatic email and SMS message before expiry of book loan.

Add qualitative requirements according to the need of the scenario.

a) Draw complete use case diagram. 8

b) Draw behavioral model of this case. 7

6. a) Explain how can code be generated from collaboration diagram. Explain taking suitable examples. 8

b) State the importance of development process in design. What do you understand by updating of class definitions? Illustrate with an example. 7

7. Write short notes on: (Any two) 2×5

a) Error and Exception handling.

b) Unified Process.

c) Activity Diagram.

POKHARA UNIVERSITY

Level: Bachelor | Semester: Fall | Year : 2014
Programme: BE | Full Marks: 100
Course: Object Oriented Design and Modelling through UML | Pass Marks: 45 | Time : 3hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1.	a)	How is Object Oriented Analysis and Design paradigm different from other paradigms? Write down the advantages of object oriented approach.	7
	b)	What are the important components of a use case model? Illustrate the importance of use case diagram for a system being developed.	8
2.	a)	What do you mean by System Event and System Operation? Draw a System Sequence diagram for return book use case of a Library system.	8
	b)	What is a contract? Write down a contract for enterItem system event explaining the significance of post conditions?	7
3.	a)	What is a Domain Model? How do you construct the Domain Model? Explain with example.	7
	b)	Define associations and attributes. Taking a system into consideration, draw the necessary classes of the system and represent the association and attributes of these classes. *(You are free to choose any system of your choice like POS, Library System)*	8
4.	a)	Define pattern and list out different types of GRASP pattern. How Expert pattern differs from Creator pattern, explain with suitable examples?	8
	b)	How do you make a conceptual model? Illustrate.	7
5.	a)	Why is interaction diagrams used? Compare and contrast the different types of interaction diagrams.	8
	b)	Explain how code can be generated from collaboration diagram	7

and design class diagram. Justify with necessary examples.

6. **Case Study** 15

In hospital a patient goes to registration machine he press the on button then the screen opens. He enters patient id number. He books for the doctor for his checkup. He checks the category of disease from given list, then he chooses doctor's name from given doctors name list, he enters time he wants to meet with doctor. For this registration he need to enters the amount, if the amount digit is ok it accepts the registration and prints the registration slip, otherwise it will give a signal of alarm of in sufficient amount.

Now draw a use case model(no description required), Domain model, interaction diagrams and design class diagram from these information.

7. Write short notes on: **(Any two)** 2×5

a) Exceptions and Error Handling

b) Programming and development process

c) Representation of system behavior.

POKHARA UNIVERSITY

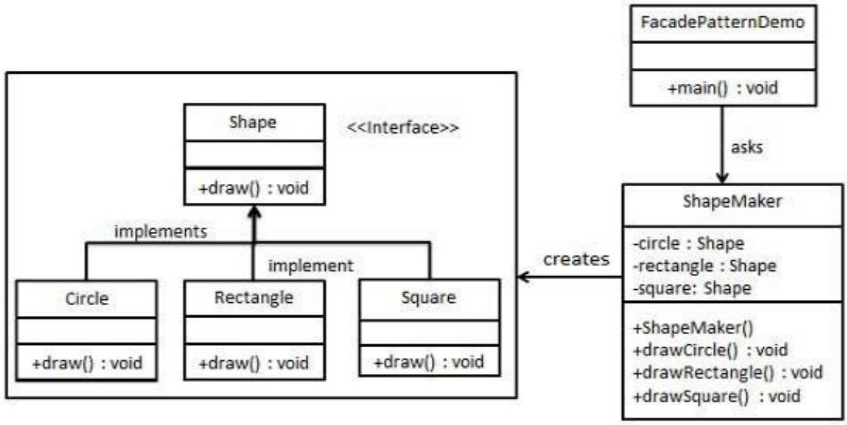
Level: Bachelor | Semester – Spring | Year : 2014
Programme: BE | Full Marks : 100
Course: Object Oriented Design and Modelling through UML | Time : 3hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1.	a)	Explain different phases and disciplines of Rational Unified Process?	6
	b)	What are the important components of a use case model? Illustrate the importance of use case diagram for a system being developed.	9
2.	a)	What are the different methods of identifying use cases? List the difference between essential and real use cases with suitable examples	8
	b)	Associations and attributes are essential components of a conceptual model. Do you agree or disagree? Justify your opinion.	7
3.	a)	What is a collaboration diagram? How do we represent mutually exclusive conditions in a collaboration diagram? Justify with an example.	7
	b)	What do you mean by system behaviour? List its types. Explain the guidelines for preparing a contract.	8
4.	a)	What are the GRASP patterns? Explain with an example how you apply the creator pattern during object design.	8
	b)	Why is class diagram important? Explain the structure of a class diagram with a necessary figure. Also list the difference of a Class diagram during analysis phase and design phase.	7
5.	a)	What is a Contract? How do you derive a contract? What are the essential parts of a contract? Explain its role taking an example.	8
	b)	What do you understand by updating of class definitions? Illustrate with an example.	7
6.	a)	Convert the given Design Class Diagram into an equivalent code. (you can choose any language like Java, C++, etc)	10



b) What do you understand by three tier architecture? How this architecture can be deployed in various configurations?

7. Write short notes on ***(Any Two)*** 5×2

a) Visibility

b) Domain Analysis

c) Exceptions and error handling

POKHARA UNIVERSITY

Level: Bachelor | Semester: Fall | Year : 2015
Programme: BE | Full Marks: 100
Course: Object Oriented Design and Modelling Through UML | Pass Marks: 45 | Time : 3hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. You are developing a system to handle checkout duties at a library. Library members may checkout books and videos from the library. The system must keep track of which books and videos each member currently has checked out. 15

   Each book and video has a unique item number that is used by the system to index that book or video, a clerk may check the status of a book (in the library, checked out, checked out and overdue) by supplying the item number. A clerk may also check either on a book by supplying the title and author or on a video by supplying only the title.

   Each library member has a library card that includes his or her membership number and the item number of the book or videos (in total), and if the borrower has no overdue books or videos, the book or video is loaned to the borrower. The conditions of the loan include a due date (two weeks for books and three days for videotapes.).

   For the above case study:

   a) List use cases and prepare use case diagram.
   b) Identify conceptual classes, and prepare a domain model.
   c) Create a sequence diagram when a library member wants to borrow a book or videotape.

2. a) Explain workflows of iterative software development model. 7
   b) What do you mean by object oriented development cycle? Explain with an example. 8

3. a) What is a contract? Explain different parts of the contract with suitable example. How do the contracts help in devising collaboration diagram? 8

b) What is attribute visibility how it is different from parameter visibility, explain with example. 7

4. a) Define conceptual class. Explain the role of domain modelling with an example 8

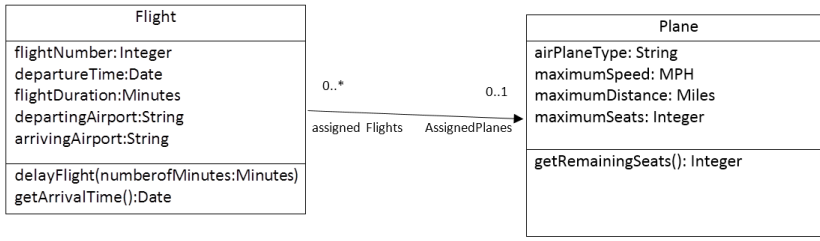
b) Explain the use of state chart diagram? Show mutual exclusive condition in Collaboration diagram with example 7

5. a) How DCD is different from Domain models? Explain method name issues in DCD. 7

b) Define GRASP. Explain the purpose of Creator pattern with an example? 8

6. a) Explain steps of mapping design to code with an example. 8

b) Convert the DCD to equivalent source code (java/c++). 7



7. Write short notes on: (**Any two**) 2×5

a) Sequence diagram

b) High coupling pattern

c) UML multiple perspectives