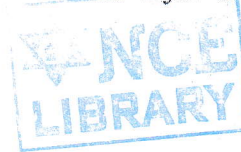


TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2082 Chaitra

Exam.	Regular	
Level	BE	Full Marks 80
Programme	BEI	Pass Marks 32
Year / Part	III / II	Time 3 hrs.

Subject: - Object Oriented Software Engineering (CT 659)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt All questions.
- ✓ The figures in the margin indicate Full Marks.
- ✓ Assume suitable data if necessary.



1. Explain how OOA, OOD and OOP are related. Difference between functional and non-functional requirements. [3+3]
2. Assume that you are the technical manager of software development organization. A client approached for a software solution. The problem stated by client have uncertainties which lead to loss if not planned and solved. Which model do you suggest for his project and why? Explain. [6]
3. Explain each phase of iterative development. Explain the different phases of the unified process. [4+4]
4. "The UML is a language for Visualizing, Specifying, Constructing and Documenting the artifacts of a software-intensive system." Justify the statement. Explain the relationships used in UML: Aggregation, Composition, Generalization, and Dependency, with proper notation. [4+4]
5. What are the basic components of Object-oriented design model. Explain. What are the differences between function/data methods and object-oriented methods for system development? [5+3]
6. Explain include and extend relationship. Identify all the actors, use cases and relationships then draw use case diagram for ATM Machine. [3+5]
7. During a T20 World Cup match, a batsman attempts to score runs. The batsman hits the ball, which travels toward the field. The umpire observes the play and determines the outcome: if the ball crosses the boundary, the umpire signals six runs; if the ball is caught or fielded, the umpire signals the number of runs completed. The scoreboard system updates the total team score based on the umpire's signal, while the team stats system updates the batsman's personal score and the overall team statistics. In case of an invalid play, such as no run or a rule violation, the umpire notifies the batsman accordingly. Draw a sequence diagram showing the interactions between the batsman, ball, umpire, scoreboard system, and team stats system, including messages such as hitBall(), travel(), signalRun(), updateScore(), and updateStats(). Include alternative flows for different outcomes of the play. [6]
8. What are the factors to be considered while selecting a project? Estimate the effort (person-months), development time (months), and average staff for a 50 KLOC software project using the COCOMO model. [2+4]
9. Draw class diagram for "Student Management System". Explain the different strategies for integration testing of object-oriented systems. [4+4]
10. Write short notes on: [4×4]
 - a) Design patterns
 - b) CRC cards
 - c) Identifying elements of an object model
 - d) Risk management Process.

TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2082 Kartik

Exam.	Back		
Level	BE	Full Marks	80
Programme	BEI	Pass Marks	32
Year / Part	III/ II	Time	3 hrs.

Subject: - Object Oriented Software Engineering (CT 659)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt All questions.
- ✓ The figures in the margin indicate Full Marks.
- ✓ Assume suitable data if necessary.

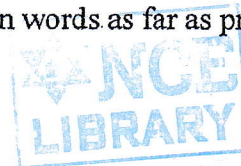
1. Why do we need to understand the requirements in a different way, how do the requirements are analyzed by different stakeholders? Is requirement analysis the same for every software development process? Justify with your answer. [3+5]
2. Compare function and data method with object oriented approaches. Explain object-oriented concepts with suitable examples. [4+4]
3. Explain waterfall process model with its pros and cons. [5]
4. Draw a use case diagram for Online Bus Ticketing System with necessary assumptions. You are first requested to write a use case scenario for this system with proper format. [4+4]
5. Explain about class relationships with appropriate symbols. Differentiate between Synchronous and Asynchronous messages in a sequence diagram. [4+2+5]
Draw the Activity Diagram for the student enrollment in the university using appropriate symbols:
 - An applicant wants to enroll in the university.
 - The applicant hands a filled-out copy of the enrollment form.
 - The registrar inspects the forms.
 - The registrar determines that the forms have been filled out properly.
 - The registrar informs students to attend a university overview presentation.
 - The registrar helps the student to enroll in seminars
 The registrar asks the student to pay for the initial tuition.
6. Draw the class diagram of ticket reservation for Kathmandu to Pokhara and vice versa for public bus service. [6]
7. What is Iterative Development Model? Explain different phases of Unified Process model with appropriate diagram. [4+4]
8. Explain the different components of an Object-Oriented design model. Briefly explain the Concurrency and Subsystem allocation in system design process. [6+4]
9. Define unit testing. Explain the different types of strategies used in the object- oriented testing. [2+6]
10. Why is the COCOMO model useful? Explain the different types of COCOMO model. [2+6]

TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2080 Ashwin

Exam.	Back		
Level	BE	Full Marks	80
Programme	BEI	Pass Marks	32
Year / Part	III / II	Time	3 hrs.

Subject: - Object Oriented Software Engineering (CT 659)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt All questions.
- ✓ The figures in the margin indicate Full Marks.
- ✓ Assume suitable data if necessary.



1. Explain prototype process model with its pros and con's. Explain the requirement engineering process used in software development. [5+5]
2. a) Differentiate between function/data methods and object-oriented methods for system development. [4]
b) How can we identify potential classes and object of an object model? Explain with an example. [6]
3. Explain conceptual model of UML. [4]
4. Briefly explain object design process in OOSE. [5]
5. Explain the Unified process with its phases. Use suitable diagrams to elaborate your answer. [8]
6. a) Draw the use case diagram for "Car Rental System". [5]
b) Draw the class diagram for "Library Management system". [5]
7. What are the factors to be considered while selecting the first project in OOSE? Explain. How risk management process is carried out in object oriented software engineering? Explain. [4+4]
8. How can you differentiate between Software Verification and Software Validation? Explain the different strategies for Integration Testing of Object-oriented systems. [2+4]
9. Calculate effort of a project, which is an organic project having a size of 48 KDLOC using COCOMO model. [3]
10. Write short notes on: [4×4]
 - a) Software Quality Assurance
 - b) Class Relationships
 - c) Inheritance and polymorphism
 - d) Software metrics

TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2079 Ashwin

Exam.	Back		
Level	BE	Full Marks	80
Programme	BEI	Pass Marks	32
Year / Part	III / II	Time	3 hrs.

Subject: - Object Oriented Software Engineering (CT 659)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt All questions.
- ✓ The figures in the margin indicate Full Marks.
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1. What are the major activities of requirement engineering process? Explain functional and Non functional requirements with proper example of each. [4+4]
2. Define concept of OOAD. Explain different phases of Unified Process (UP). [2+6]
3. a) What are the major concepts of object orientation? What are the benefits of object orientation? [2+4]
 - b) Differentiate between structured and object oriented approach of system design. [4]
4. What are the basic building blocks of UML? What are the various types of UML diagrams drawn to handle static and dynamic component of software under development? [7]
5. What are the major features of object based DBMS? How object based DBMS differs from RDBMS? [2+4]
6. Is there any linkage between system design and object design? Explain. What are the major components of object oriented design model? [2+4]
7. For the case study given below identify classes, attributes, methods, relationships between classes and draw class case diagram. [7]

ABC bank has many branches, each of which has an address and branch number. Each branch may have upto three extension counters. A customer opens accounts at a branch. Each account is uniquely identified by an account number; it has a balance and a credit overdraft limit. There are many types of accounts like a saving account, a current account and a credit card account which has an expiry date and can have secondary cards attached to it. It is possible to have a joint account (e.g. for a husband and wife). Each type of account has a particular interest rate, a monthly fee and a specific set of privileges (e.g. ability to write cheques, insurance for purchase etc. ABC bank is divided into divisions and subdivisions (such as Risk Management, Planning, Investments and Consumer), the branches are considered subdivisions of the consumer division. Each division has a manager and a set of other employees. 'Each customer is assigned a particular employee as his or her 'personal banker'.
8. Explain include and extends relationships in use case diagram. [2+5]

For the case study given below identify all the actors, use cases and relationships also draw use case diagram.

Software version of Monopoly game

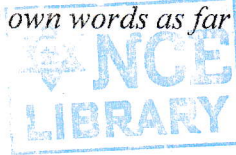
This will run as a simulation; the user will configure the game (i.e. indicate the number of players etc), start the simulation and let the game run to its conclusion. A trace log will be created to record each move a player makes. The simulation should include the rules of the game and keep track of the amounts each player earns/loses throughout the game. The simulation should allow the user to select various strategies to be employed by the players in the game.
9. How Object Oriented based software Testing differs from conventional type of software testing? Explain how unit testing can be conducted in context of Object Oriented system development. [2+5]
10. What could be the possible risks in software development projects? Explain Risk Management process with proper flow diagram. [2+4]
11. Write short notes on: [2×4]
 - a) CRC in object modeling
 - b) Object Oriented design metrics

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INSTITUTE OF ENGINEERING
Examination Control Division
2081 Chaitra

Exam.	Regular		
Level	BE	Full Marks	80
Programme	BEI	Pass Marks	32
Year / Part	III / II	Time	3 hrs.

Subject: - Object Oriented Software Engineering (CT 659)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt All questions.
- ✓ The figures in the margin indicate Full Marks.
- ✓ Assume suitable data if necessary.



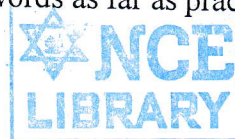
1. Differentiate between functional and non-functional requirements. Explain requirement engineering process in software development. [3+5]
2. Assume following scenario and draw use case diagram, sequence diagram and activity diagram.
An e-commerce platform allows customers to browse products, add them to their cart, and place orders. Each order may contain multiple products. The system checks product availability before confirming the order. After an order is confirmed, it notifies the warehouse team to prepare the shipment. Customers can view their order status and track the shipment. The system also sends email notifications to customers about order confirmation, payment updates, and shipping details. [5+5+5]
3. Explain the importance of modern age software engineering. Explain about prototyping process model highlighting its importance's in software development. [3+5]
4. Explain iterative development in OOSE. Explain the different disciplines of Unified Process. [4+4]
5. Compare Function and Data Method with Object Oriented Approaches. [4]
6. What are the factors to be considered while selecting a project? How can we calculate the effort and duration of a project using COCOMO model? Explain with an example. [2+6]
7. Explain the different components of an Object-Oriented design model. [6]
8. What are the different process flows of object oriented design? Explain. [6]
9. Why is software testing important? Briefly describe thread based testing and use based testing. [2+4]
10. What are the main processes of risk analysis in software engineering? Explain. [5]
11. Write short notes on: [2×3]
 - a) Class Relationship
 - b) Inter-class test case design

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Examination Control Division
2080 Chaitra

Exam.	Regular		
Level	BE	Full Marks	80
Programme	BEI	Pass Marks	32
Year / Part	III / II	Time	3 hrs.

Subject: - Objected Oriented Software Engineering (CT 659)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
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1. Define Software Process. Explain the general activities involved in software process. Justify this statement "Walking on water and developing software from specification are easy if both are frozen". [1+2+5]
2. Why we need to identify the requirement while developing object-oriented software engineering? Explain Requirement engineering process in detail. [3+5]
3. Briefly outline the fundamental phases of the Unified Process and pinpoint one advantage and one potential challenge associated with its application. [5]
4. How is object element is identified and constructed in object-oriented software development? [6]
5. Explain the basic building blocks of the UML. "The UML is a language for Visualizing, Specifying, Constructing and Documenting the artifacts of a software-intensive system." Justify the statement. [4+4]
6. Develop UML use case diagram and activity diagram for the following scenario. Sajha Yatayat owns a number of busses. Each bus is allocated to a particular route, although some routes may have several buses. Each route passes through a number of towns. One or more drivers are allocated to each stage of a route, which corresponds to a journey through some or all of the towns on a route. Some of the towns have- a garage where busses are kept and each of the busses are identified by the registration number and can carry different numbers of passengers, since the vehicles vary in size and can be single or double-decked. Each route is identified by a route number and information is available on the average number of passengers carried per day for each route. Drivers have an employee number, name, address, and sometimes a telephone number. [5+5]
7. As the Team Lead of a software development team employing iterative development for a project, provide a concise overview of how the iterative process works. Identify its key benefit and a potential drawback. [5]
8. Explain the different types of strategies is used in the different level of testing in object-oriented testing. [6]
9. Explain about risk management in object-oriented software development. [6]
10. Define Software Quality Assurance (SQA). What are the various activities and tasks involved in SQA? Explain in brief. [1+5]
11. Write Short notes on: [3×4]
 - a) Advance Class
 - b) System design process in OOD
 - c) COCOMO Model

TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2079 Chaitra

Exam.	Regular		
Level	BE	Full Marks	80
Programme	BEI	Pass Marks	32
Year / Part	III / II	Time	3 hrs.

Subject: - Object Oriented Software Engineering (CT 659)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt All questions.
- ✓ The figures in the margin indicate Full Marks.
- ✓ Assume suitable data if necessary.



1. a) Explain the Spiral Life cycle Model with its advantages and disadvantages. [6]
b) Explain requirement engineering process in software development. [6]
2. Explain how OOA, OOD and OOP are related. How can we identify objects in a system? Explain with appropriate examples. [3+5]
3. What are the elements of the Conceptual Model of UML? Explain. [4]
4. Assume following scenario and draw use case diagram, Activity diagram and sequence diagram. [5+5+5]
Customer request for the Menu. Menu is provided to the customer from the database of food ordering system. Customer select the dishes from the list. Customer can add the dishes if required. Manager confirm the order and send invoice to customer. Customer pays the bill that is generated from the system and manager process the order for delivery.
5. Briefly explain Iterative development in OOSE. What are the different disciplines of Unified Process? Explain. [4+4]
6. Define the basic component of Object-oriented design model. Explain about system design process with its basic activities involved in the object-oriented design. [4+4]
7. Why testing is necessary in system development? Differentiate between thread -based testing and use-based testing. [3+4]
8. What are the factors to be considered while selecting a project? List any two examples of potential risk areas involved in OOSE projects and how can we manage them? [2+4]
9. What are the steps to generate multiple class random test curves? Explain. [4]
10. Write short notes on: [2×4]
 - a) Class relationships
 - b) Multiple class testing

TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2078 Chaitra

Exam.	Regular		
Level	BE	Full Marks	80
Programme	BEI	Pass Marks	32
Year / Part	III / II	Time	3 hrs.

Subject: - Object Oriented Software Engineering (CT 659)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt All questions.
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1. a) Elaborate the meaning and need of Software Engineering? How do you differentiate Classical and Modified Waterfall Lifecycle model? [2+2]
b) What is Requirement Engineering? Differentiate between Functional and Non-Functional Requirements. [1+3]
2. a) What are the differences between function/data methods and object-oriented methods for system development? [3]
b) How can we identify potential classes and object of an object model? Explain with an example. [5]
3. a) Prepare a Use Case diagram for Online Movie Ticket booking System with necessary assumptions. [6]
b) "The UML is a language for Visualizing, Specifying, Constructing and Documenting the artifacts of a software-intensive system." Elaborate this statement. [4]
4. Draw a class diagram for the Flight Management System with necessary assumptions. [6]
5. Briefly explain Iterative development in OOSE. What are the different phases of Unified Process (UP)? Explain. [4+4]
6. a) Briefly explain partitioning the analysis model in system design process. [4]
b) Explain the different layers of objected-oriented design pyramid. [4]
7. a) What are the basic OO testing strategies? [4]
b) List out the overall approaches for designing Object Oriented Test Case. [4]
8. What are the factors to be considered while selecting a project? How can we calculate the effort and duration of a project using COCOMO model? Explain with an example of your own. [2+6]
9. Write short note on :
 - i) Agile Software Development
 - ii) Software Quality Assurance
 - iii) Class Relationships
 - iv) Multiple class testing[4×4]