

Nepal College of Information Technology
Balkumari, Lalitpur

Level: Bachelor

Semester: Spring

Year: 2024

Programme: BE Software

Full Marks: 100

Course: Object oriented Design and Modeling using UML

Time: 3 hrs.

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

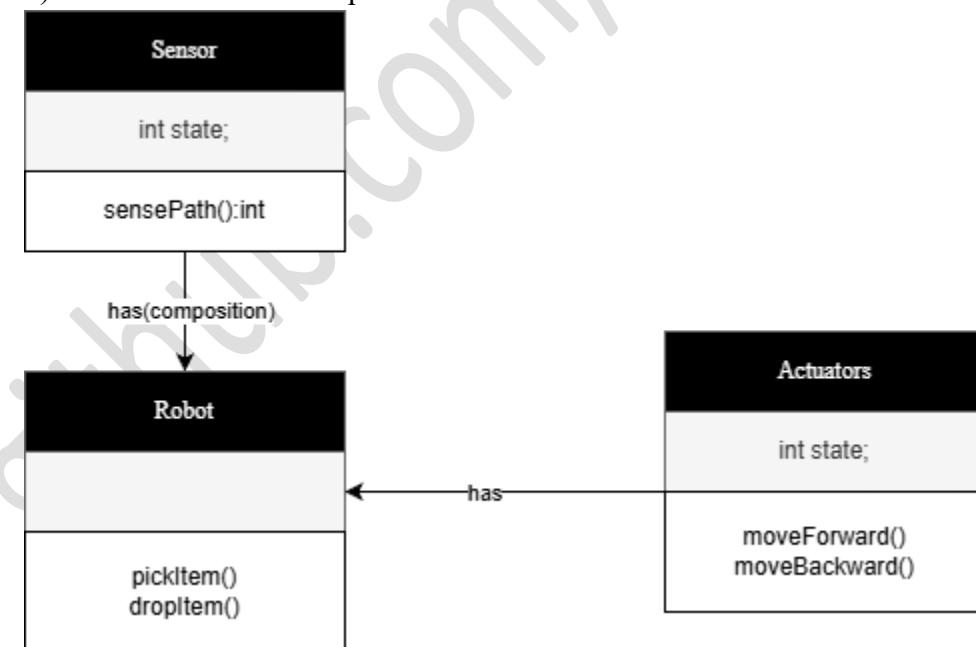
The figures in the margin indicate full marks.

Attempt all the questions.

1. a) What are the key differences between Object-Oriented analysis and design (OOAD) and other software development paradigms? Can you provide an example that illustrates the distinction between Object-Oriented Analysis and Object-Oriented-Design? 3+4
b) Explain how the Unified Modeling language (UML) facilitates the visualization, specification, construction, and documentation of artifacts in an object-oriented system. Provide examples of different notations used in UML, along with concise explanations for each notation. 4+4
2. a) Draw a Use Case Diagram for a Vending machine Ensure to include relevant actors and use cases. Write the fully dressed use case format for the “checkout goods” Functionality in a Vending Machine. 4+4
b) What are associations and attributes in domain model. Explain how do you identify the domain objects or conceptual class in domain model including common mistakes that are made while identifying the conceptual classes. 3+4
3. a) What is system event and system operation? What is contract explain format to write contract, also write down a contract for the system operation enterItem(id:int, quantity:int) in POS application. 2+5
b) Discuss the distinctions between model and a class diagram. Imagine a company is developing a Healthcare Management System to handle patient records, appointments, and medical facilities. The system needs to allow patients to schedule appointments, access medical record, and receive prescriptions. Healthcare providers should manage patient records, schedule appointments, and update medical histories. Administrators need to oversee facility operations, manage staff schedules, and handle billing.
Draw a class diagram for Healthcare Management System. Identify and illustrate the main entities, their attributes, and relationships between the entities. Your diagram should represent the key concepts and their associations within the system. 2+6
4. a) A bank is planning to develop an Online Banking system (OBS) to allow customers to perform various banking transactions online. The system should enable customers to register, log in, view account balances, transfer funds, pay bills, and view transaction history. Bank staff should be able to manage customer accounts, process transactions, and handle customer inquiries. The system should also provide notifications to customers about

their transactions and system should also provide notifications to customers about their transactions and account activities.

- i. Draw a use case diagram to represent the functional requirements for the Online Banking System. Identify and illustrate the primary actors and use cases involved in the system.
- ii. Create a Activity diagram to illustrate the process of a customer transferring funds to another account. Ensure your diagram captures the interaction between the customer, the online banking system, and any other relevant components or actors involved in this process. 4+4
- b) How is sequence diagram different from collaboration diagram. How the following terms represent in sequence diagram.
 - i. Synchronous and asynchronous message
 - ii. Instantaneous message and non-instantaneous message
 - iii. Conditional message
 - iv. Message to is self
- 5. a) Define GRASP. Explain the purpose of Creator and Low coupling pattern with example. 4+4
- b) Define Visibility. Explain all visibility available with suitable examples. 7
- 6. a) Explain steps of mapping design to code. Discuss about exception handling in UML diagrams. 3+4
- b) Convert the DCD to equivalent source code. 8



- 7. Write short notes on: (Any two) 2x5
 - a) Rational Unified Process
 - b) Creating methods from interaction diagrams
 - c) Test driven development.