

PURBANCHAL UNIVERSITY

2026

B. E. Computer / Third Semester / Final

Time: 03:00 hrs.

Full Marks: 60 / Pass Marks: 24

BCE3007: Object Oriented Analysis and Design

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

The figures in the margin indicate full marks.

Group-A

Attempt ALL questions

4×2=8

1. How object oriented approach solve the real world problem?
2. How do you add associations and attribute on Domain modeling?
3. What are the differences between interaction diagrams and design class diagram.
4. What is the purpose of an Aggreaction relat2ionship in UML?

Group-B

Attempt SEVEN questions

7×4=28

5. What are the common guidelines for identifying domain classes?
6. Identify actors, relations and Draw a use case diagram for a scenario: A user accesses the login system to authenticate their identity. New users can register for an account, existing users can log in with their credentials, and users who have forgotten their password can reset it through a secure process. Upon successful login, the system provides access to personalized content and sends a security notification through email.
7. How is system behaviour represented in object-oriented Analysis?
8. Describe an Operation Contract and explain its significance with a suitable example.
9. What are the key advantages exception and error handling?
10. Explain the concepts of interface and implementation in an object-oriented programming language.
11. Differentiate between a Sequence Diagram and a Collaboration Diagram.
12. Describe Booch Methodology with suitable example.

Group-C

Attempt THREE questions

3×8=24

13. Draw class diagram of payment gateway for a e-commerce website for following scenario: A customer visits an c-commerce website and proceeds to checkout. To complete the purchase, they are redirected to the Online Payment Gateway. The

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customer logs in using their registered email and password. Upon successful login, the gateway authenticates the user and fetches their associated account details. The customer choose to pay from their wallet balance. The system checks the available balance and initiates a withdrawal of the required amount. The transaction is processed, the account balance is updated. and a confirmation is sent. Later, the customer decides to add funds to their wallet and initiates a deposit via net banking. The gateway processes the deposit, credits the amount to the customer's account, and logs the transaction. All activities--login, withdrawal, and deposit—are securely handled and recorded by the payment gateway. Explain the conversion from behavioral diagram to class diagram give a suitable example and Implement the class diagram in any object oriented programming language.

14. Read the case study carefully and draw sequence diagram of online ordering system:

A customer browses an e-commerce website and adds items to their cart. After reviewing the cart, they proceed to checkout. The system prompts them to log in or continue as a guest. The customer logs in with their credentials, and the system validates the login. Once authenticated, the customer selects a payment method and confirms the order. The ordering system sends the order details to the inventory system to check item availability. The inventory system verifies stock and reserves the items. The ordering system then forwards the payment request to the payment gateway. The payment gateway processes the transaction and returns a success or failure response. Upon successful payment, the ordering system confirms the order, updates the order status, and sends an order confirmation email to the customer. The inventory system reduces the stock levels. Finally, the customer receives an order summary and can track the shipment status.

15. Explain Responsibility Driven Design in detail.

16. Write short notes on:

2×2=4

(a) Global Visibility

(b) Risk driven and client driven approach

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