



PAN AFRICA CHRISTIAN UNIVERSITY

UNIVERSITY EXAMINATIONS: 2025/2026

END OF SEMESTER EXAMINATION

**BACHELOR OF SCIENCE INFORMATION TECHNOLOGY AND BACHELOR OF
BUSINESS INFORMATION TECHNOLOGY**

BSIT300 / BIT300: OBJECT ORIENTED ANALYSIS AND DESIGN

**DATE: WEDNESDAY, XXXX, DECEMBER, 2025
HOURS**

TIME: 2

**INSTRUCTIONS: Question One is Compulsory, Choose Three Other
Questions**

SECTION A (COMPULSORY)

QUESTION ONE (10 Marks) Compulsory

a) Identify the UML diagrams used for the following: **[2
Marks]**

- i. Modelling the behaviour of an object
- ii. Modelling interaction between groups of objects

b) Based on the context specified, identify the most fitting UML relationship that best describes the relationship between each pair of objects or classes given. Answer with one of the following: *aggregation*, *association*, *generation/specification*. **[2
Marks]**

- i. In software process: People to Development Activity
- ii. In Travel: Car Trunk to Luggage
- c) Using a well labelled package diagram, create a package called structures with the following attributes public registration number, private address, protected exam results.

[3]

Marks]

- d) Differentiate between `<<extend>>` and `<<include>>` relationships in use case diagram. Show their differences using a library system.

[3]

Marks]

SECTION B
(ANSWER ANY THREE (3) QUESTIONS IN THIS SECTION)

QUESTION TWO (10 marks)

- a) Explain the tool you will use to represent the following:

- i. Data movement

[2]

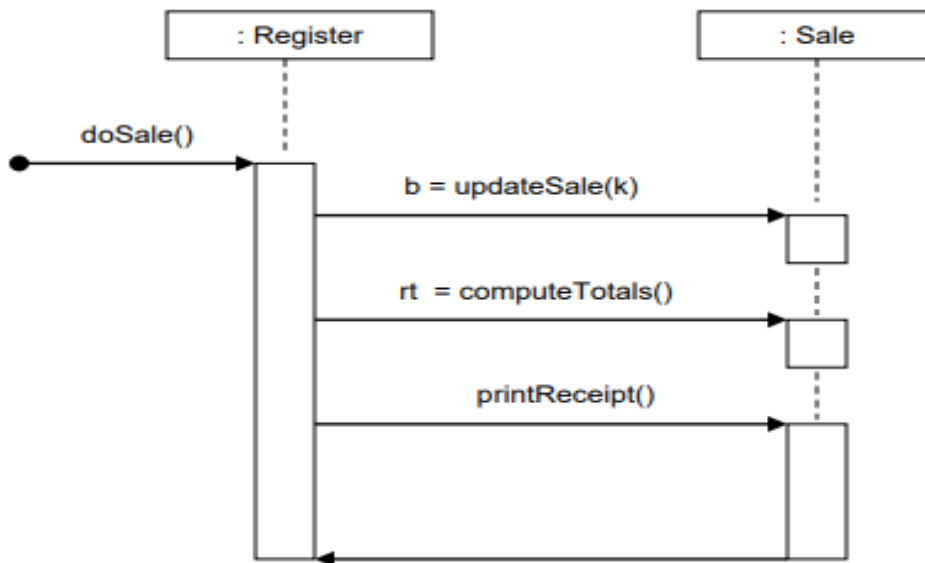
Marks]

- ii. Relationship among classes

[2]

Marks]

- b) Examine the following sequence diagram and answer the questions that follow:



- i. Identify the lifeline. [2

Marks]

- ii. Explain what is happening in the sequence diagram above. [4

Marks]

QUESTION THREE (10 marks)

- a) Differentiate between generalization and association relationships. [2

Marks]

b) A busy Restaurant consists of one Chef, a customer and one Waiter. The Chef is responsible for ordering all the food ingredients, preparation of the food and doing the washing up. The Waiter is responsible for taking the customer order, preparing the bill and taking the payment made by the customer. The customer browses the menu, orders the food, consumes the food, orders the bill and pays the bill.

Draw the Use Case Diagram for the Restaurant showing role of Chef, Waiter and Customer. [8

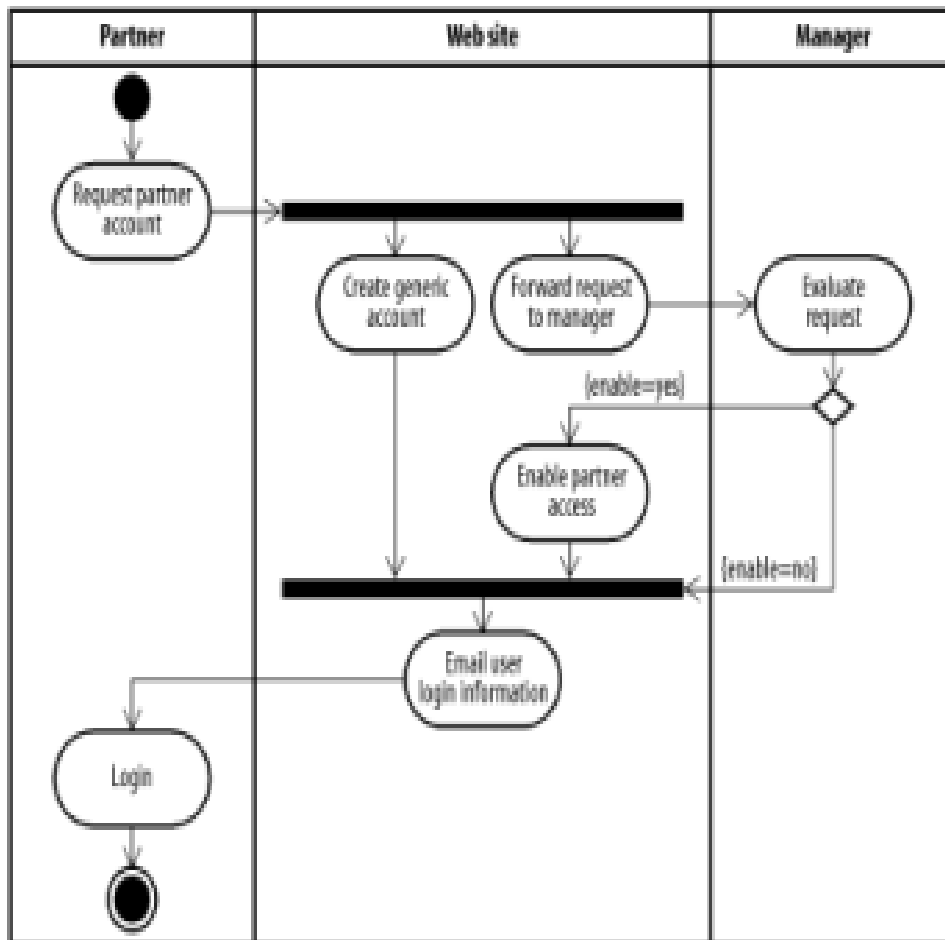
Marks]

QUESTION FOUR (10 marks)

- a) Outline two benefits of Object-Oriented Analysis and Design. [2

Marks]

b) Answer the questions that follow the UML diagram below.



- i. Identify the type of diagram represented in the figure above. **[1 Mark]**
- ii. State how the above diagram represents parallel programming. **[3 Marks]**
- iii. Explain in detail two individual component parts that make up the above diagram. **[4 Marks]**

QUESTION FIVE (10 marks)

- a) Outline any three analysis patterns that can be implemented in Object Oriented analysis and design. **[3 Marks]**

b) Consider a system where a student is required to login to online portal with a student Id number, and their password. The student can check fee balance, generate fees statement, and check provisional results. Develop a sequence diagram to model this system interaction. Show the objects involved in the interaction and the messages to be sent across.

[7 Marks]

QUESTION SIX (10 marks)

A hotel chain wants to develop a centralized reservation system to manage bookings across their multiple hotels. The system should allow guests to search for available rooms, make reservations, and manage their bookings. Hotel administrators should be able to manage room inventory, process reservations, and generate reports.

- i. Identify any 5 classes from the scenario above. **[5**

Marks]

- ii. Draw a use case diagram from the scenario and ensure it shows inheritance, extend and include relationship. **[5**

Marks]

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