MOSHOOD ABIOLA POLYTECHNIC, ABI...
DEPARTMENT OF COMPUTER SCIENCE
FIRST SEMESTER EXAMINATION 2023/2024 SESSION

COURSE TITLE: UNIFIED MODELING LANGUAGE COURSE CODE: COM 213
CLASS: COMP. SCI. ND II (FT & PT) TIME ALLOTTED: 3HRS

INSTRUCTION: 1. Attempt ANY FOUR QUESTIONS from SECTION A and ANY ONE QUESTION from SECTION B
2. Write only your matric number on the question paper, nothing else.

SECTION A

1a. Structure a dummy class diagram and illustrates the core three compartments (5mks)

b. What does the following symbols represents in class diagram? (i) # (ii) - (iii) ~ (iv) + (4mks)

c. Give the notation and descriptions to the following class diagrams names: (i) Association (ii) Composition (iii) Generalization (iv) Object (v) Aggregate (10mks)

d. Give one (1) purpose of class diagram (1mk)

2a. Who are the 'Three Amigos' of the leading object-oriented programming researchers? Itemize the model developed by each researcher (6mks)

b. Classify the following UML diagrams into **Behaviour Diagram** and **Structure Diagram:** (i) State Machine diagram (ii) Package diagram (iii) Timing diagram (iv) Composite diagram (iv) Activity diagram (5mks)

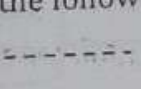
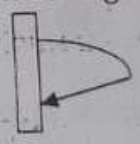
c. Mention on the four (4) components of the UCD (4mks)

d. Give the notation to the following UCD names: (i) Interface (ii) Note (iii) Package (iv) Anchor (v) System boundary (5mks)

3a. Give three (3) distinct points that differentiate sequence diagram from other UML diagrams (4.5mks)

b. Write briefly on the following sequence diagram names; (i) Recursive message (ii) Scope (iii) Message with constraint (iv) Object (v) Message with attribute (7.5mks)

c. Provide the appropriate names to the following sequence diagram notations:

(i) [Instance]: Class (ii)  (iii)  (iv)  (8mks)

4a. What is the relationship between flowchart and activity diagram? (2.5mks)

b. Provide the notation to the following descriptions in activity diagram:

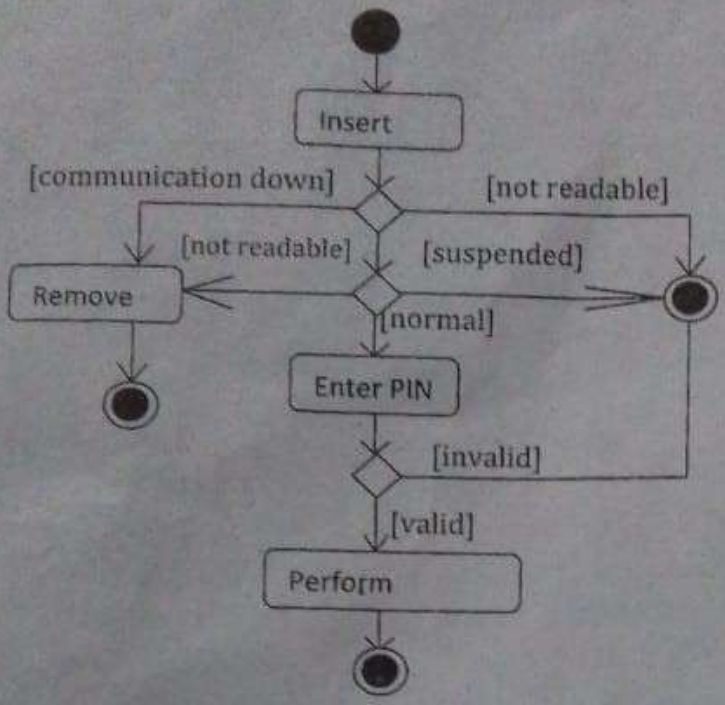
i. It has a single incoming transition and multiple outgoing transitions exhibiting parallel behavior

ii. It controls the final node that stops all flows in an activity

iii. It is a con troll node that accepts token on one or more incoming edges and select outgoing edges from two or more outgoing flows

iv. It ascertains that all the parallel sets of activities are completed before the next activity starts
v. Represents individual activity of the system **(7.5mks)**

c. Study the activity diagram in Figure 1 and analyze at least ten (10) points from the diagram



(10mks)

Figure 1: Activity Diagram for ATM Transaction

5a. State four (4) reasons why statechart diagram is important? **(4mks)**

b. Explain the statechart diagram in Figure 2 and analyze six (6) points from the diagram:

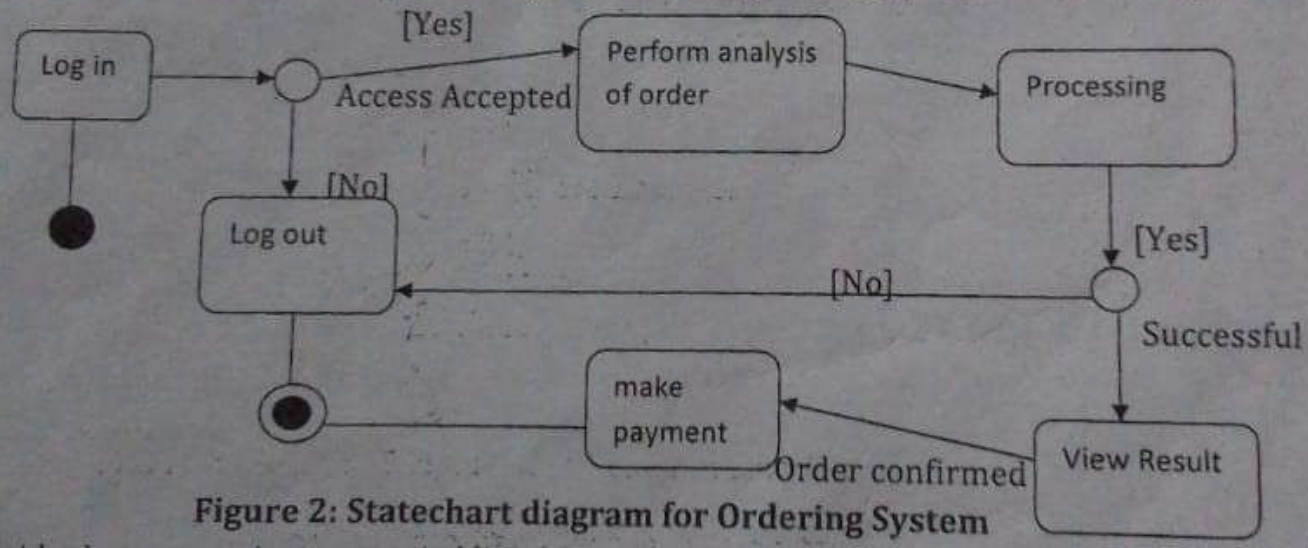
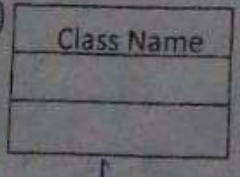


Figure 2: Statechart diagram for Ordering System **(6mks)**

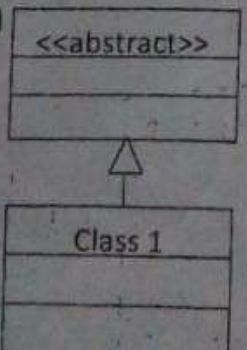
c. Provide the appropriate name and brief descriptions of the following class diagram notations:

(i)



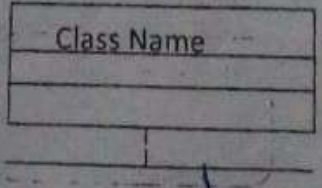
Class

(ii)



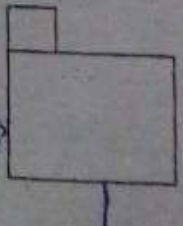
Concrete class

(iii)



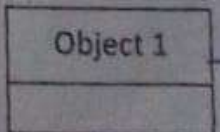
Association class

(iv)



Package

(v)



Link

(10mks)

SECTION B (ALTERNATIVE TO PRACTICAL)

6ai. Draw a sequence diagram for the process of logging into a web application. (6mark)

ii. Describe the different types of relationships between classes (association, aggregation, composition, inheritance (2marks)

iii. Explain the concept of multiplicity in class diagrams. Provide examples. (2marks)

bi. Draw a use case diagram for an online shopping system. Include at least three actors and five use cases (6marks)

ii. What is UML and why is it important in software development (2marks)

iii. Explain the concept of "actors" in a use case diagram. (2marks)

7ai. Draw an activity diagram for the process of booking a flight online. (5marks)

ii. What is the purpose of a sequence diagram? (2marks)

iii. Explain the concept of multiplicity in class diagrams. Provide examples. (3marks)

bi. Draw a class diagram for a university enrollment system. Include at least four classes and their relationships. (6marks)

ii. Explain the main elements of an activity diagram. (2marks)

iii. Describe how decision nodes and merge nodes are used in activity diagrams. (2marks)