INTERNATIONAL CENTRE FOR APPLIED SCIENCES
MAHE, MANIPAL
B.Sc. (Applied Sciences) in Engg.
End – Semester Theory Examinations – NOV 2021
III SEMESTER - SOFTWARE DESIGN USING OBJECT ORIENTED PARADIGM (ICS 233)

Time: 3 Hours **Date: 24 NOV 2021** **Max. Marks: 50**

- ✓ **Answer ALL questions.**
- ✓ **Missing data, if any, may be suitably assumed.**

1A. Explain Noun-Phrase Approach and apply the same for the below short case study to generate the domain model that use Noun-Phrase approach. [5]

A restaurant would like to develop an automated version of the existing booking sheet. The new system should display to make it easy for restaurant staff to transfer from the manual system. When new bookings are recorded, or changes made to existing bookings, the display should be immediately updated, so that restaurant staff are always working with the latest information available. The system must make it easy to record significant events that take place when the restaurant is open, such as the arrival of a customer. Operation of the system will be as far as possible by direct manipulation of the data presented on the screen.
Hint: The key business requirement would be to accept and record the customers reservations. Also, reservations are normally made for more than one person, and the people eating can be described as customers of the restaurant. People are also allowed to walk-in to the restaurant without a reservation.

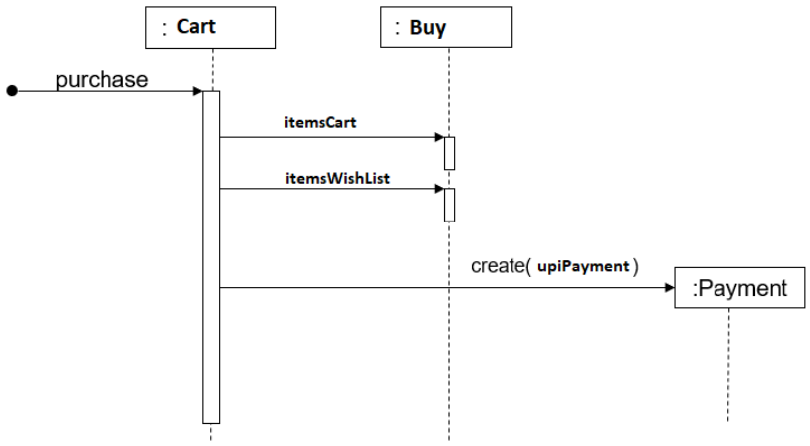
1B. Telecom Service Providers are required to setup outlets to provide the services offered to their customers. The connection types required by customers could be Prepaid or Postpaid. The service required may typically include getting a new connection, terminating a connection, change in plan types from prepaid to postpaid and vice versa. New connection requires mandatory Aadhar verification and payment collection for a new SIM card. Existing plan to be known for change in plan type and should be confirmed by the customer with an OTP verification. The Store clerk helps to get a new connection, change in plan, collecting payment. However, Store Supervisor has to get involved for new connection and termination of existing connections.
Draw a Use Case diagram restricting to the information provided above.
(i) Identify the different types of actors for the above scenario and label them and the typical use cases from your analysis of the subsystem [2.5]
(ii) Identify if there are any include and extend relationships and any association relationships that can be represented in the use case. [2.5]

2A. Define event, state and transition, transition action and guard condition with the help of appropriate examples for each. [5]

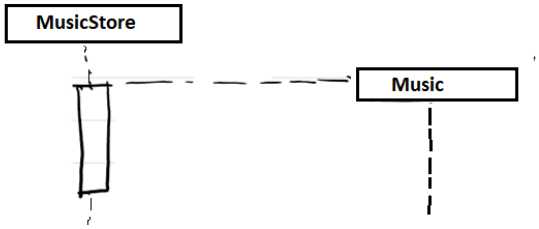
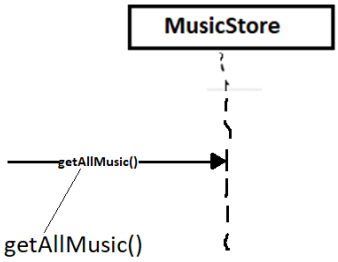
2B. Differentiate the context where we use Generalization and Realization with the help of a simple and same example. [5]

3A. Explain how coupling could be measured and justify with an example why it is important to achieve Low Coupling? [5]

3B. Write the Java Code for the below Sequence Diagram. [5]



4A. Identify the GRASP Pattern seen in the below example and explain the same with appropriate labels marked in the modified diagram. [5]

(i)	(ii)
	

4B. A company produces 2 types of cements: Ordinary and White. The method used to get the taste of them is getUsage() and returns 'Refinement Work' for White cement and 'Construction Work' for Ordinary cement. Apply a standard pattern to produce this 2 types of cement and see to it that getUsage() yields the correct type for the respective type of cement. [5]

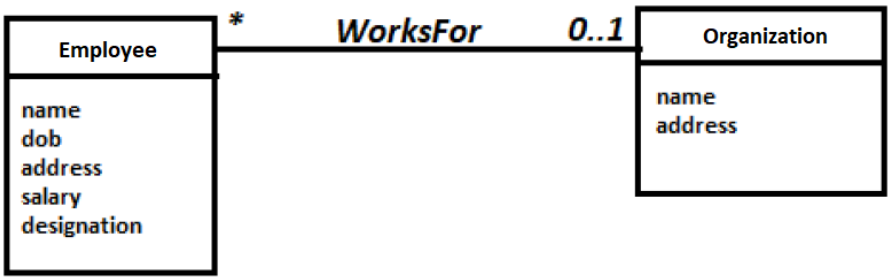
Hint: Required Java Code and UML diagram must be drawn.

5A. The activities to be completed are accepting the ID, verifying the ID, accepting the book, checking the issuing of a book, stamping the due date and handing the book to the member. These are the activities are listed in the detailed use case as mentioned below. Draw a Swimlane activity diagram (UML) for checking out a book from our Library. [5]

Actions performed by the Student	Responses from the system (Clerk)
1. The member arrives at the check-out counter with a set of books and supplies the clerk with his/her identification number	
2. The clerk issues a request to check out books	
	3. The system asks for the user ID
4. The clerk inputs the user ID to the system	
	5. The system asks for the ID of the book

6. The clerk inputs the ID of a book that the user wants to check out	
	7. The system records the book as having been issued to the member; it also records the member as having possession of the book. It generates a due-date. The system displays the book title and due-date and asks if there are any more books
8. The clerk stamps the due-date on the book and replies in the affirmative or negative	
	9. If there are more books, the system moves to Step 5; otherwise it exits
10. The customer collects the books and leaves the counter	

5B. Identify if there is something wrong with the below diagram and give reasons for the same and correct it if it is wrong. [5]



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