

Master of Software Engineering  
1<sup>st</sup> year, 2<sup>nd</sup> Semester Examination, 2024  
**Subject: Object Oriented Software Systems**

Time – Three hours

Full marks - 100

*Answer any five(5) questions.*

1. [4+8+8]
  - a) What is the importance of modeling in object oriented and explain modeling principles.
  - b) How to identify Classes and Objects with suitable Examples.
  - c) Briefly explain following characteristics and themes of object-oriented systems: inheritance, encapsulation, and polymorphism.
  
2. [4+8+8]
  - a) Pen down the names all the UML Diagrams. Identify each of the UML diagrams belong to structural and which of these belong to behavioral group
  - b) Explain with an example how to depict an asynchronous message.
  - c) What is difference between include, extend, generalization justify these 3 notations with proper diagram.
  
3. [4+8+8]
  - a) What is the main advantage of object-oriented development?
  - b) Show how stereotypes, tagged values, constraints can be used in UML.
  - c) Explain aggregation and composition with example(s).
  
4. [4+8+8]
  - a) Explain the package diagrams in UML, the need, notations and Concept.
  - b) Draw a sequence diagram for withdrawal of money from ATM.
  - c) Draw a class diagram for “Current Account” class and the “Savings accounts” class both inherit from the more general class “Account”.
  
5. [4+8+8]
  - a) Specify the problem domain, requirements for online payment system.
  - b) What is interaction diagram? Mention the types of interaction diagram with suitable examples.
  - c) Explain about Unified Process Phases.
  
6. [4+8+8]
  - a) Explain how design patterns solve design problems.
  - b) Give brief description about the singleton creational pattern.
  - c) Explain details about the prototype design pattern.

[ Turn over

7. [4+8+8]
- a) State and explain the classification of design patterns.
  - b) Describe in detail about the essential elements of the design pattern.
  - c) Explain abstract factory design pattern.
8. [4+8+8]
- a) Draw and explain the structure and object diagram for flyweight pattern.
  - b) Describe the proxy pattern with issues, consequences etc.
  - c) Write short notes on chain of responsibility.
9. [4+8+8]
- a) What is Known as Gang of Four?
  - b) Explain the structure of Adapter design pattern with class diagram and consequences.
  - c) What is the Observer pattern, and how does it enable objects to notify others of changes in state?