

Code No: R1941052

**R19**

**Set No. 1**

**IV B. Tech I Semester Regular Examinations, November – 2022**

**UML & DESIGN PATTERNS  
(Computer Science and Engineering)**

**Time: 3 hours**

**Max. Marks: 75**

*Answer any FIVE Questions  
ONE Question from Each unit  
All Questions Carry Equal Marks*

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**UNIT-I**

- 1 a) Write the Importance of modeling. Give the features of object oriented modelling. [10]  
b) Describe principles of modeling [5]  
(OR)
- 2 a) What are the various relationships used in UML? Summarize them. [7]  
b) Describe the common modelling techniques of class diagram. [8]

**UNIT-II**

- 3 a) What are the dependency relationships in use case? Explain with notations and examples? [7]  
b) What are the interaction diagrams? Briefly explain with examples [8]  
(OR)
- 4 a) Define and differentiate the sequence diagram and system sequence diagram with example? [7]  
b) Design an Use case diagram for ATM withdrawal mechanism. [8]

**UNIT-III**

- 5 a) Write the Common modeling techniques for component diagram [7]  
b) How to use design patterns? Explain in detail [8]  
(OR)
- 6 a) Explain about selection of a design pattern. [7]  
b) How a Design pattern solves the design problem? Illustrate with an example [8]

**UNIT-IV**

- 7 a) Explain the sample code of Flyweight pattern. [7]  
b) What are consequences of Builder pattern? Explain Builder pattern implementation [8]



Code No: R1941052

**R19**

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(OR)

- 8 a) Write sample code of Prototype pattern. [7]  
b) Discuss about implementation issues of Decorator pattern [8]

**UNIT-V**

- 9 What is a chain of responsibility pattern? In what scenarios to apply this pattern? [15]

(OR)

- 10 What problem does Command pattern solve? What are the important roles in Command pattern? Explain [15]

JNTU FAST UPDATES



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**UNIT-I**

- 1 a) Discuss in detail about object oriented modeling [7]  
b) Discuss about UML artifacts and SDLC phases and how they can be mapped? [8]

(OR)

- 2 a) What is the relation between UML and OOAD? Describe. [7]  
b) Draw the class diagram for customer support system [8]

**UNIT-II**

- 3 a) Explain the sequence of steps for creating methods from interaction diagrams by taking an example. [7]  
b) Explain the use case diagram for a library management system. [8]

(OR)

- 4 a) Draw use case diagram for online shopping. [7]  
b) What are the goals and scope of a use case? How to identify a Use case? [8]

**UNIT-III**

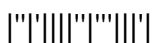
- 5 a) Write the Common modeling techniques for deployment diagrams. [7]  
b) Give an account on MVC architecture with a neat diagram [8]

(OR)

- 6 a) Give an overview on component diagram. How is it different from deployment diagram? [7]  
b) How to select a design pattern? Illustrate with an example. [8]

**UNIT-IV**

- 7 a) What are the implementation issues of prototype design pattern? Discuss [7]  
b) With a neat diagram explain the motivation of Abstract Factory Method [8]



(OR)

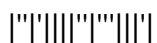
- 8 a) What is a Decorator design pattern? Give the steps to implement it. [7]  
b) Explain the Motivation and Sample code Of Singleton design pattern. [8]

**UNIT-V**

- 9 a) Discuss the implementation issues of Strategy behavioral pattern. [7]  
b) Can you alter the sequence of steps of any process with Template pattern? Justify. [8]

(OR)

- 10 a) What is Command Pattern? Describe in detail about structure, participants and collaborations of Command pattern. [7]  
b) Explain the motivation and applicability of observer pattern. [8]



Code No: R1941052

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**UNIT-I**

- 1 a) Write the basic building blocks of UML. [7]  
b) What are the UML diagrams? Explain them with notations and the relationships used [8]
- (OR)
- 2 a) Define association and aggregation among classes. [7]  
b) Describe Software Development Life Cycle with a neat diagram. [8]

**UNIT-II**

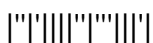
- 3 a) How do you identify states in a state chart diagram? Give an example. [7]  
b) Draw the sequence diagram for library management system? [8]
- (OR)
- 4 a) What is generalization? Explain how it is used in use case model with an example [7]  
b) Design component and deployment diagrams for traffic management system. [8]

**UNIT-III**

- 5 a) Describe the consistent format for describing the design patterns. [7]  
b) Design Component and Deployment diagrams for Traffic Management system. [8]
- (OR)
- 6 a) Write the differences between component and deployment diagrams. [7]  
b) What is the basis for classifying design patterns? Categorize and tabulate the design patterns. [8]

**UNIT-IV**

- 7 a) What are the two variations of the Adapter pattern? Explain them [7]  
b) The Singleton uses a special method to instantiate objects. What is special about this method? [8]



(OR)

- 8 a) When can be a Flyweight pattern effectively be applicable? Explain. [7]  
b) What are the different language features that are exploited by proxy pattern? [8]

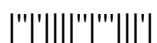
**UNIT-V**

- 9 a) What to expect from design patterns? Explain. [7]  
b) How the Broad cast communication is possible in Observer? Give appropriate code block. [8]

(OR)

- 10 a) Write about the implementation issues of memento pattern [7]  
b) Explain about motivation of Mediator pattern [8]

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**UNIT-I**

- 1 a) Discuss in detail about advanced relationships. How to represent them? [7]  
b) Write the common modeling techniques for Object diagram. [8]  
(OR)
- 2 a) What are the various types of UML diagrams drawn to handle static and dynamic component of software under development? [7]  
b) How to identify the attributes and relationships in a class? Explain with a suitable example. [8]

**UNIT-II**

- 3 a) What is an activity diagram? Explain how activity diagram focuses on flows driven by internal processing with the help of suitable example? [7]  
b) Draw a State chart Diagram for library management system. [8]  
(OR)
- 4 Draw use case diagram for ATM and state chart diagram. [15]

**UNIT-III**

- 5 a) Draw a component diagram for Library management system. [7]  
b) Discuss the artifacts to be identified for drawing component diagram. [8]  
(OR)
- 6 a) Describe the Catalog of Design Patterns. [7]  
b) Draw a deployment diagram for Hospital management system. [8]

**UNIT-IV**

- 7 a) What problem does Builder pattern try to solve? Describe. [7]  
b) What is the intent and motivation of Facade pattern? Explain. [8]



(OR)

- 8 a) Discuss in detail about the participants and consequences of Composite pattern. [7]  
b) Can we use an abstract factory for supporting multiple window system in Lexi's design? Explain [8]

**UNIT-V**

- 9 a) What are the implementation issues to be considered in Chain of Responsibility pattern? Explain [7]  
b) What are the difference between the Strategy pattern and the Template Method pattern? [8]

(OR)

- 10 a) Discuss about the structure and participants of Interpreter pattern. [7]  
b) In what scenarios does one select a Strategy pattern? How does strategy pattern alter the runtime behavior? [8]

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