# SRM VALLIAMMAI ENGINEERING COLLEGE

SRM Nagar, Kattankulathur–603203

## DEPARTMENT OF CYBER SECURITY

## QUESTION BANK

**VI SEMESTER**
**1923606–SOFTWARE ENGINEERING AND UML PATTERNS**
**Regulation–2019**
**Academic Year 2024–2025 EVEN**

*Prepared by*

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**DEPARTMENT OF CYBER SECURITY**

**QUESTION BANK**

**SUBJECT : 1923606–SOFTWARE ENGINEERING AND UML PATTERNS**

**SEM/YEAR: VI / III**

| UNIT I - SOFTWARE PROCESS AND AGILE DEVELOPMENT | | | |
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| **Introduction to Software Engineering, Software Process, Perspective and Specialized Process Models – Introduction to Agility–Agile process–Extreme programming–XP Process–Quality management–SQA– SQA plan** | | | |
| **PART-A(2-MARKS)** | | | |
| **Q.No** | **QUESTIONS** | **Competence** | **BT Level** |
| 1. | Write the IEEE definition of software engineering | Remember | BTL-1 |
| 2. | Demonstrate your understanding of umbrella activities of a Software process. | Apply | BTL-3 |
| 3. | If you have to develop a word processing software product, what process model will you choose? Justify your answer and examine. | Apply | BTL-3 |
| 4. | Differentiate verification and validation. Give an example. | Understand | BTL-2 |
| 5. | List the characteristics of software contrasting it with characteristics of hardware. | Remember | BTL-1 |
| 6. | Explain How do we create a process that can manage unpredictability? | Evaluate | BTL-5 |
| 7. | Identify the human factors considered for an agile software development. | Remember | BTL-1 |
| 8. | Is it possible to realize Win-Win spiral model for software. Analyse | Analyze | BTL-4 |
| 9. | Summarize the pros and cons of iterative of software development model. | Evaluate | BTL-5 |
| 10. | Define agile process .Give any two agile principles. | Remember | BTL-1 |
| 11. | List two deficiencies in waterfall model. Which process model do you suggest to overcome each deficiency. | Remember | BTL-1 |
| 12. | Compare perspective and specialized process model. | Analyze | BTL-4 |
| 13. | Predict about XP story. | Understand | BTL-2 |
| 14. | Discuss about the various drawbacks of spiral model. | Understand | BTL-2 |
| 15. | Generalize on any two characteristics of software as a product. | Create | BTL-6 |
| 16. | Show what led to the transition from product oriented development to process oriented development. | Apply | BTL-3 |
| 17. | Differentiate SDD and DDD. | Analyze | BTL-4 |

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| 18. | Create six new practices that are designed to help ensure that an XP project works successfully for significant projects within a large organization. | Create | BTL-6 |

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| 19. | Summarize on extreme programming. | Understand | BTL-2 |
| 20. | Why system engineers must understand the environment of a system? Give two reasons. | Remember | BTL-1 |

**PART-B(13-MARKS)**

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| 1. | Define software life cycle. List all life cycle models and explain spiral model with a neat diagram. | (13) | Remember | BTL-1 |
| 2. | (i) Explain alteast one scenario where a) RAD model would be applicable and not the waterfall model. b) (b)Waterfall model is preferable compare to all other models.<br>(ii) What are the pros and cons of using mathematical approach for software development? | (7)<br>(6) | Analyze | BTL-4 |
| 3. | (i) Describe about agile modeling in detail.<br>(ii) Explain the component based software development model with a neat sketch | (7)<br>(6) | Remember | BTL-1 |
| 4. | (i)Write short notes on aspect oriented software development.<br>(ii) Explain in detail about personal process models and team process models. | (7)<br>(6) | Evaluate | BTL-5 |
| 5. | (i) Compare the life cycle models based on their distinguishing factors, strengths and weaknesses.<br>(ii) Discuss the prototyping model .what is the effect of designing prototype on the overall cost of the software project? | (7)<br>(6) | Analyze | BTL-4 |
| 6. | (i)Compare the lifecycle models based on their distinguishing factors, strengths and weaknesses.<br>(ii)Discuss the prototyping model.what is the effect of designing Prototype on the over all cost of the software project? | (7)<br>(6) | Analyze | BTL-4 |
| **7.** | (i) Explain in detail about iterative and waterfall model.<br>(ii)Write short notes on concurrent models. | (7)<br>(6) | Analyze | BTL-4 |
| 8. | (i) Discuss in detail about Scrum.<br>(ii) What is the significance of the spiral model when compared with other model? | (7)<br>(6) | Understand | BTL-2 |
| 9. | (i)Discuss the Extreme Programming process.<br>(ii)What are some of the issues that lead to an XP debate? | (7)<br>(6) | Understand | BTL-2 |
| 10. | (i) Illustrate about agility and cost of change.<br>(ii) What key traits must exist among the people on an effective software team? | (7)<br>(6) | Apply | BTL-3 |

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| 11. | (i) What is agility in the context of software engineering work?<br>(ii) List the principles of agile software development. | (7)<br>(6) | Understand | BTL-2 |
| 12. | (i) Compose your view about agile software development.<br>(ii) Generalize your view about extreme programming. | (7)<br>(6) | Create | BTL-6 |
| 13. | (i) Describe about pair programming and how unit tests used in XP?<br>(ii) List the new practices appended to XP to create IXP. | (7)<br>(6) | Remember | BTL-1 |
| 14. | (i) Explain software product engineering with its services and advantages.<br>(ii) Write a note on the unique characters of a software. | (7)<br>(6) | Apply | BTL-3 |
| **PART-C(15-MARK)** | | | | |
| 1. | Generalize about system engineering hierarchy with suitable diagram and give an overview of the Business process Engineering with a diagram. | (15) | Create | BTL-6 |

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| 2. | Compare the following life cycle models based on their distinguishing factors, strengths and weakness-waterfall model, AD model, Spiral | (15) | Evaluate | BTL-5 |
| | Model, and Formal Methods Model.(Present in the form of table only use diagrams wherever necessary). | | | |
| 3. | Explain about the umbrella activities which support software development process and discuss about their necessity in maintaining the quality in both software process and product that is being developed for railway reservation system. | (15) | Evaluate | BTL-5 |
| 4. | Assume that you are the technical manager of a software development organization. A Client approached you for a software solution the problems stated by the client have uncertainties which lead to loss if it not planned and solved which software development model you will suggest for this project – justify. Explain that model With its pros and cons and neat sketch.. | (15) | Evaluate | BTL-5 |
| **UNIT II- REQUIREMENTS ANALYSIS AND SPECIFICATION** | | | | |
| Software Requirements: Functional and Non-Functional, User requirements, System requirements, Software Requirements Document – Requirement Engineering Process: Feasibility Studies, Requirements elicitation and analysis, requirements validation, requirements management-Classical analysis: Structured system Analysis, Petri Nets- Data Dictionary. | | | | |
| **PART-A(2-MARKS)** | | | | |
| **Q.No** | **QUESTIONS** | | **Competence** | **BTLevel** |
| 1. | Give a use case diagram for an online shopping which should provide provisions for registering authenticating the customers and also online payment through any payment gateway like PayPal. | | Understand | BTL-2 |
| 2. | Define feasibility study. And list the types. | | Remember | BTL-1 |

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| 3. | Classify the following as functional /non-functional requirements for a banking system<br>(a) Verifying bank balance<br>(b) Withdrawing money from bank<br>(c) Completion of transactions in less than one second.<br>(d)Extending the system by providing more tellers for the customers | Apply | BTL-3 |
| 4. | Draw and explain a simple semantic data model for a library Management system. | Analyze | BTL-4 |
| 5. | List the characteristics of a good system requirements specification(SRS). | Remember | BTL-1 |
| 6. | Define Quality Function Development(QFD). | Remember | BTL-1 |
| 7. | How requirements are classified? List them with an example for each. | Apply | BTL-3 |
| 8. | Develop the spiral view of requirement engineering process. | Create | BTL-6 |
| 9. | . Differentiate between normal and exciting requirement. | Understand | BTL-2 |
| 10. | Point out the problems faced when user requirements are written in natural language. | Analyze | BTL-4 |
| 11. | Distinguish between the terms inception, elicitation and elaboration with reference to requirements | Understand | BTL-2 |
| 12. | Distinguish between the terms inception, elicitation and elaboration with reference to requirements. | Remember | BTL-1 |
| 13. | Classify the metrics for specifing non-functional requirements. | Analyze | BTL-4 |
| 14. | Express the different types of check list that should be carried out for requirement validation process. | Understand | BTL-2 |
| 15. | Explain how to manage changing requirements during the requirements elicitation process? | Evaluate | BTL-5 |
| 16. | What is meant by structural analysis and volatile requirement? | Remember | BTL-1 |

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| 17. | Classify the common data Dictionary notations. | Apply | BTL-3 |
| 18. | Define Petri Net and list types of traceability in a software process. | Remember | BTL-1 |
| 19. | Explain, how the requirements are validated? | Evaluate | BTL-5 |
| 20. | Generalize on the concept of data dictionary. | Create | BTL-6 |

**PART-B(13-MARK)**

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| 1. | (i) Differentiate functional and non-functional requirements.<br>(ii) Give the steps involved in initiating requirements engineering. | (7)<br>(6) | Understand | BTL-2 |
| 2. | (i)What are called as non –functional requirements ? Explain in Detail.<br>(ii)Summarize on user requirements and system requirements in detail. | (7)<br>(6) | Remember | BTL-1 |
| 3. | (i)List and explain the Three aspects that SRS should clearly document.<br>(ii) List the characteristics of good SRS document and their components. | (7)<br>(6) | Remember | BTL-1 |
| 4. | (i)Demonstrate the structure of requirement document.<br>(ii)Show the possible users of requirement document. | (7)<br>(6) | Apply | BTL-3 |

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| 5. | Explain the different ways of writing a system requirement specification.<br>Describe the spiral view of system requirement. | (7)<br>(6) | Remember | BTL-1 |
| 6. | Analyze about the requirement engineering process and how the Requirements are managed. | (13) | Analyze | BTL-4 |
| 7. | (i) What is the purpose of feasibility study?<br>(ii) State the inputs and results of the feasibility study.<br>(iii) List any four issues addressed by a feasibility study.<br>(iv) Elaborate the phases involved when carrying out a feasibility study | (4)<br>(3)<br>(3)<br>(3) | Remember | BTL-1 |
| 8. | What is requirement elicitation? Briefly describe the various activities performed in requirements elicitation with an example of a watch system that facilitates to set time and alarm and assess. | (13) | Evaluate | BTL-5 |
| 9. | i) What is feasibility study? how it helps in requirement engineering process.<br>ii) How will you classify the requirement types of a project, give example.<br>iii) List the stake holders and all types of requirements for an online train reservation system .. | (5)<br>(4)<br>(4) | Create | BTL-6 |
| 10. | Write short notes on the list given below<br>(i) Requirements discovery and Interviewing.<br>(ii) Scenarios and Use cases.<br>(iii) Ethnography | (5)<br>(4)<br>(4) | Remember | BTL-1 |
| 11. | (i) Classify the different types of checks carried out on the requirements in the requirements document during the validation process.<br>(ii) Demonstrate on the requirement validation techniques. | (7)<br>(6) | Apply | BTL-3 |
| 12. | (i) Discuss about the requirement management planning.<br>(ii) Describe about the requirement change management. | (7)<br>(6) | Understand | BTL-2 |
| 13. | (i) Analyze briefly about the structural system analysis in detail.<br>(ii) Explain about classical pertinets model. | (7)<br>(6) | Analyze | BTL-4 |

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| 14. | (i) What is the purpose of dataflow diagrams? What are the notations used for the same?<br>(ii) Explain by constructing a context flow diagram level-0 DFD and | (7)<br>(6) | Analyze | BTL-4 |
| | Level-1 DFD for a library management system. | | | |
| **PART-C(15-MARKS)** | | | | |
| 1. | Develop an online railway reservation system, which allows the user to select route, book/cancel tickets using net banking/credit/debit cards. The site also maintains the history of the passengers. For the above<br>system, list and draw the use case scenario and model the above | (15) | Create | BTL-6 |
| | specification. | | | |

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| 2. | Assess on software requirement specification for banking system. | (15) | Evaluate | BTL-5 |
| 3. | Draw and Explain the use case diagram for an ATM system in requirement elicitation. | (15) | Evaluate | BTL-5 |
| 4. | Develop the process of ordering a pizza over the phone. Draw the use case diagram and also sketch the activity diagram representing each step of the process, from the moment you pick up the phone to the point where you start eating the pizza. Include activities that others need to perform. Add exception handling to the activity diagram you developed. Consider at least two exceptions (e.g. delivery person wrote down wrong address, deliver person brings wrong pizza). | (15) | Create | BTL-6 |
| **UNIT III-SOFTWARE DESIGN** | | | | |
| Design process – Design Concepts-Design Model– Design Heuristic – Architectural Design - Architectural styles, Architectural Design, Architectural Mapping using Data Flow- User Interface Design: Interface analysis, Interface Design –Component level Design: Designing Class based components, traditional Components. | | | | |
| **PART-A(2-MARKS)** | | | | |
| 1. | What do you interpret from design heuristics? | | Understand | BTL-2 |
| 2. | List two principles of good design. | | Remember | BTL-1 |
| 3. | What do you infer from the design quality attributes 'FURPS'? | | Analyze | BTL-4 |
| 4. | Draw the context flow graph of an ATM automation system. | | Remember | BTL-1 |
| 5. | 'A system must be loosely coupled and highly cohesive'. Justify. | | Evaluate | BTL-5 |
| 6. | Define Modularity. | | Remember | BTL-1 |
| 7. | Give the various types of architectural styles with example. | | Understand | BTL-2 |
| 8. | What is coupling and list the various types of coupling? | | Remember | BTL-1 |
| 9. | How do you apply modularization criteria for monolithic software? Discuss. | | Understand | BTL-2 |
| 10. | Define mapping. | | Remember | BTL-1 |
| 11. | Analyze an UI design pattern are used for the following.<br>i) Pagelayout<br>ii) Tables<br>iii) Navigation through menus and webpages<br>iv) Shopping cart. | | Analyze | BTL-4 |
| 12. | Distinguish between transform flow and transaction flow. | | Understand | BTL-2 |
| 13. | List the basic design principles of class based component. | | Remember | BTL-1 |
| 14. | Point out the steps that are applied to develop a decision table in tabular design notation. | | Analyze | BTL-4 |
| 15. | Classify the four distinct frame work activity in the user interface analysis and design process. | | Apply | BTL-3 |
| 16. | Design the architectural context diagram. | | Create | BTL-6 |
| 17. | In case of user interface analysis, assess the steps that are taken for understanding the problems. | | Evaluate | BTL-5 |
| 18. | Classify the user interface design steps. | | Apply | BTL-3 |
| 19. | Show the facilities to be provided in a system to recover users from the mistakes. | | Apply | BTL-3 |

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| 20. | Generalize on the concept of user interface design pattern. | | Create | BTL-6 |
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| **PART-B(13-MARKS)** | | | | |
| 1. | Explain the following list of design concept<br>(i) Abstraction and Modularity<br>(ii) Patterns<br>(iii) Functional independence | (5)<br>(4)<br>(4) | Remember | BTL-1 |
| 2. | Explain about software architecture design, with emphasize as fan in, fan-out, coupling, cohesion and factoring. | (13) | Evaluate | BTL-5 |
| 3. | Analyze your understanding on the following design models<br>(i) Data design elements and Architectural design elements.<br>(ii) Interface design elements and Component-level design elements.<br>(iii) Deployment-level design elements. | (5)<br>(4)<br>(4) | Analyze | BTL-4 |
| 4. | (i) Demonstrate in detail about architectural design.<br>(ii) Illustrate in detail about any four architectural styles. | (7)<br>(6) | Apply | BTL-3 |
| 5. | (i) Give the steps involved in transform mapping.<br>(ii) Discuss transform mapping with example.. | (7)<br>(6) | Understand | BTL-2 |
| 6. | (i) List the steps involved in transaction mapping. (ii)Describe transaction mapping with example | (7)<br>(6) | Remember | BTL-1 |
| 7. | (i) Discuss the basic design principles of class based components.<br>(ii) Discuss the component level design guidelines | (7)<br>(6) | Remember | BTL-1 |
| 8. | Describe the various coupling and cohesion methods used in software design. | (13) | Understand | BTL-2 |
| 9. | Examine Architectural Styles.<br>(i) Data centered Architecture and DataFlow Architecture.<br>(ii) Call and Return Architecture and Object Oriented Architecture.<br>(iii) Layered Architecture. | (5)<br>(4)<br>(4) | Apply | BTL-3 |
| 10. | (i) Analyze on the concept of graphical design notation.<br>(ii) Explain Tabular Design Notation | (7)<br>(6) | Analyze | BTL-4 |
| 11. | i) Describe about user interface analysis in detail.<br>ii) Explain the general model of a realtime system. | (7)<br>(6) | Remember | BTL-1 |
| 12. | (i) Generalize on the concept of user interface design and list the characteristics of a good user interface design<br>(ii) Develop the design issues in interface design. | (7)<br>(6) | Create | BTL-6 |
| 13. | (i) Analyze about program design language in designing conventional components.<br>(ii) Classify and explain the various architectural styles in detail. | (7)<br>(6) | Analyze | BTL-4 |
| 14. | (i) Describe how UID may be developed for a data acquition system.<br>(ii) Discuss the design heuristics for effective modularity design. | (7)<br>(6) | Remember | BTL-1 |
| **PART-C(15-MARKS)** | | | | |

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| 1. | Model a Dataflow diagram for a"Library Management System".State And explain the functional requirements you are considering. | (15) | Evaluate | BTL-5 |

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| 2. | What is the purpose of DFD? what are the components of DFD? Design DFD for the following system:<br>An on-line shopping system for XYZ provides many services and<br>benefits to its members and staffs. Currently ,XYZ staffs manually handle the purchasing information with the use of basic office software, | (15) | Create | BTL-6 |
| | such ass Microsoft office word and excel.it may results in having mistakes easily and the process is very inconvenient . XYZ needs an online shopping system at their intranet based on the requirement of users. XYZ online shopping system has 5 key features:<br>i) to provide the user friendly online shopping cart function to members to replace hardcopy ordering form.<br>ii) o store inventory and sales information in data base to reduce the human mistakes, increase accuracy and enhance the flexibility of information processing.<br>iii) To provide an efficient inventory system which can help the XYZ staffs to gain enough information to update the inventory.<br>iv) To able to print invoice to members and print a set of summary reports for XYZ internal usage.<br>v) To design the system that is easy to maintain the upgrade. | (5)<br>(5)<br>(5)<br>(5)<br>(5) | Evaluate | BTL-5 |
| 3. | Summarize on the Hierarchical concept of user interface design and Draw the swimlane diagram for prescription refill function. | (15) | Evaluate | BTL-5 |
| 4. | Rewrite the concept of OCP in your own words.Why is it important to create abstraction that serve as an interface between components? | (15) | Create | BTL-6 |

UNIT – IV : STATIC UML DIAGRAMS

Class Diagram— Elaboration – Domain Model – Finding conceptual classes and description classes – Associations – Attributes – Domain model refinement – Finding conceptual class Hierarchies – Aggregation and Composition – Relationship between sequence diagrams and use cases – When to use Class Diagrams.

**PART-A(2-MARKS)**

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| 1. | What are the 3 main elements of a class diagram? | Remember | BTL-1 |
| 2. | What is the importance of class diagram? | Analyze | BTL-4 |
| 3. | What is the main function of class diagram? | Understand | BTL-2 |
| 4. | Why association is used in class diagram? | Remember | BTL-1 |
| 5. | What is a domain class diagram? | Remember | BTL-1 |

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| 6. | What are the tasks performed in elaboration in UML? | Evaluate | BTL-5 |
| 7. | What are the artifacts of elaboration? | Remember | BTL-1 |
| 8. | What is the elaboration phase? | Analyze | BTL-4 |
| 9. | What are the main components of the domain model? | Remember | BTL-1 |
| 10. | What are the attributes visibility in UML? | Understand | BTL-2 |
| 11. | What two UML diagram are used to model domain classes? | Remember | BTL-1 |
| 12. | What is difference between data model and domain model? | Apply | BTL-3 |
| 13. | How do you identify classes in a class diagram? | Apply | BTL-4 |
| 14. | What are the three major elements of the UML conceptual model? | Understand | BTL-2 |
| 15. | What are the concepts involved in domain model refinement? | Create | BTL-6 |
| 16. | What is the purpose of class hierarchy diagram?. | Apply | BTL-3 |

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| 17. | What is composition vs aggregation in UML diagram? | Apply | BTL-3 |
| 18. | Relationship between sequence diagrams and use cases | Create | BTL-6 |
| 19. | When should we use class diagram? | Understand | BTL-2 |
| 20. | In what situations should we use ER diagrams vs UML class diagrams? | Evaluate | BTL-5 |

**PART-B(13-MARKS)**

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| 1. | Discuss about UML. | (13) | Understand | BTL-2 |
| 2. | Define UML Association vs. Aggregation vs. Composition. | (13) | Analyze | BTL-4 |
| 3. | Design the class diagram for Airline Reservation System. Find and draw the conceptual classes for the same. | (13) | Create | BTL-16 |
| 4. | (i) Describe the strategies used to identify the conceptual classes. (10)<br>(ii) Mention the steps to create a domain model used for representing the conceptual classes. | (13) | Understand | BTL-2 |
| 5. | Summarize the Elaboration phase. Discuss the difference between elaboration and inception with example. | (13) | Understand | BTL-2 |
| 6. | Explain in detail about domain Model refinement. | (13) | Analyse | BTL-4 |
| 7. | Describe briefly about association classes and association role. | (13) | Remember | BTL-1 |
| 8. | (i) Illustrate about aggregation and composition with example. (10)<br>(ii) Mention the guidelines to be followed. (3) | | Apply | BTL-3 |
| 9. | What is System Sequence Diagram? Illustrate the relationship between sequence diagram and Use Case with example. | (13) | Analyse | BTL-4 |
| 10. | What are the guidelines used to partition the classes in the domain model to be organized into packages? Explain with suitable examples. | (13) | Remember | BTL-1 |

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| 11. | What are the guidelines used to partition the classes in the domain model to be organized into packages? Explain with suitable examples. | (13) | Remember | BTL-1 |
| 12. | Analyze the guidelines to define a conceptual subclass and conceptual super class with suitable example. | (13) | Analyze | BTL-4 |
| 13. | For the Next Gen POS systems design, summarize the following Conceptual class hierarchies.<br>(i) Conceptual super class (3)<br>(ii) Conceptual subclass (3)<br>(iii) Authorization Transaction classes. (3)<br>(iv) Abstract Conceptual classes. (4) | (3)<br>(3)<br>(3)<br>(4) | Evaluate | BTL-5 |
| 14. | (i) Describe the UML notation for class diagram with example.<br>(ii) Describe the concepts of link, association and Inheritance. | (7)<br>(6) | Remember | BTL-2 |
| **PART-C(15-MARKS)** | | | | |
| 1. | With a suitable example, evaluate and explain how to design a class. Give all possible representation in a class (such as: name, attribute, visibility, methods, and responsibilities). | (15) | Evaluate | BTL-5 |

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| 2. | Construct design for Library Information System which comprises the following notations and explain them.<br>(i) Aggregation<br>(ii) Composition<br>(iii) Association | (5)<br>(5)<br>(5) | Create | BTL-6 |
| 3. | Design the Class diagram for Hospital management system? Find and draw conceptual classes for the same? | (15) | Create | BTL-6 |
| 4. | A University conducts examinations and the results are announced. Prepare a report for the following.<br>• Print the marks in the register number order semester wise for each department<br>• Print the Arrear list semester wise<br>. • Prepare a Rank list for each department.<br>• Prepare the final aggregate mark list for final year students.<br>Identify the problem statement and Design and Explain the classes for each sequence.<br>Design the Use case, Class, and Sequence diagrams for designing this system. | (15) | Create | BTL-6 |
| **UNIT – V : DYNAMIC AND IMPLEMENTATION UML DIAGRAMS** | | | | |
| Dynamic Diagrams – UML interaction diagrams – System sequence diagram – Collaboration diagram – When to use Communication Diagrams – State machine diagram and Modelling –When to use State Diagrams – Activity diagram – When to use activity diagrams Implementation 145 Diagrams – UML package diagram – When to use package diagrams – Component and Deployment Diagrams – When to use Component and Deployment diagrams | | | | |
| **PART-A(2-MARKS)** | | | | |
| 1. | Express the use of Sequence Diagram. | | Remember | BTL-2 |
| 2. | Compare sequence diagram and collaboration diagram. | | Analyze | BTL-2 |
| 3. | Differentiate Class diagram and Interaction diagram. | | Evaluate | BTL-3 |
| 4. | Identify what is by System Behavior? How to name System events and Operations. | | Analyze | BTL-1 |

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| 5. | Define Event, State and Transition. | Remember | BTL-1 |
| 6. | Define Package. Mention the three layers of package diagram. | Understand | BTL-4 |
| 7. | Analyze the use of UML Package Diagram. | Understand | BTL-1 |
| 8. | List the common notations used in interaction diagram. | Evaluate | BTL-6 |
| 9. | Create a state machine diagram for Process Sale. | Understand | BTL-1 |
| 10. | Define Component. | Remember | BTL-2 |
| 11. | Demonstrate the similarities and dissimilarities of state independent and State dependent objects. | Remember | BTL-5 |
| 12. | Compare and Contrast Component and Deployment diagram. | Analyse | BTL-5 |
| 13. | Mention the purpose of Activity diagram and specify its elements. | Apply | BTL-1 |
| 14. | Name the basic elements of a Deployment diagram. | Remember | BTL-1 |
| 15. | Organize and Show the relationship between Interaction and Class diagram with example. | Create | BTL-3 |
| 16. | Outline the need for State Diagram. | Analyze | BTL-2 |
| 17. | Differentiate Class diagram and Interaction diagram. | Apply | BTL-4 |
| 18. | Experiment the term Classifier with an example. | Create | BTL-3 |
| 19. | Create SSD for Borrow book scenario. | Evaluate | BTL-6 |
| 20. | Justify the use of rake symbol with an example. | Analyze | BTL-5 |
| PART-B(13MARKS) | | | |

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| 1. | Summarize with an example, how Interaction Diagram are used to model the dynamic aspects of a system. | (13) | Understand | BTL-2 |
| 2. | Describe the basic Communication diagram notations. (13) | (13) | Remember | BTL-1 |
| 3. | Illustrate about UML Deployment and Component diagram with an example. | (13) | Understand | BTL-2 |
| 4. | Interpret about UML state machine diagram and Modeling. | (13) | Understand | BTL-2 |
| 5. | Compare sequence diagram and communication diagram with suitable example. | (13) | Analyze | BTL-4 |
| 6. | (i) Analyze the UML activity diagram, using an example point out the features of basic UML activity diagram notation.<br>(ii) Inspect the constructs (notations) used in an activity diagram? | (8)<br>(5) | Analyse | BTL-4 |
| 7 | (i)What is the purpose of State Chart diagram.<br>(ii) Recall how to draw state chart diagram with an example. | (4)<br>(9) | Remember | BTL-1 |
| 8. | (i)Design and explain the activity diagram for an Online Purchase System.<br>(ii) Represent the activity diagram for the following Scenario, Booking a ticket on Indian railways e-ticket system (IRCTC). | (7)<br>(6) | Create | BTL-6 |
| 9. | Describe briefly about logical architecture and UML package diagram. | (13) | Remember | BTL-2 |

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| 10. | (i) What is SSD? Determine the notations used in sequence diagram. (5)<br>(ii) Determine SSD for Library Management System. (8) | (5)<br>(8) | Analyze | BTL-4 |
| 11. | (i) When to use activity diagrams. (3)<br>(ii) Describe the Implementation diagrams with example. (10) | (3)<br>(10) | Remember | BTL-1 |
| 12. | Examine briefly about UML sequence diagram notations with example. | (13) | Analyse | BTL-4 |
| 13. | (i) Identify when to use UML deployment and Component diagrams. (7)<br>(ii) Draw the diagrams for banking applications. (6) | (7)<br>(6) | Apply | BTL-3 |
| 14. | With an example make ue of the notations used in sequence diagram for the following:<br>(i) Object destruction (2)<br>(ii) Frames (2)<br>(iii) Conditional message (3)<br>(iv) Mutually exclusive conditional message (3)<br>(v) Iterations over a collection (3) | <br>(2)<br>(2)<br>(3)<br>(3)<br>(3) | Apply | BTL-3 |
| | PART-C(15MARKS) | | | |
| 1. | Consider the Hospital Management System application with the following requirement<br>(i) System should handle the in- patient and out-patient information through receptionist.<br>(ii) Doctors are allowed to view the patient history and give their prescription.<br>(iii) There should be an Information system to provide the required information. Give the state chart, Component and Deployment diagram. (5+5+5) | (5)<br>(5)<br>(5) | Create | BTL-6 |
| 2. | For an ATM system, every user has to be validated with a PIN number to make a transaction. A customer is allowed 3times to validate card giving the correct | (15) | Evaluate | BTL-5 |

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| | PIN number. Show the Use Case representation for the same and summarize the<br>"Validate User" Use Case using sequence diagram. Assess and represent the activity diagram for the same. | | | |

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| 3. | Consider an elevator that has the basic functions such as moving up and down and open and close doors and pick up passengers. The elevator is supposed to be used in a building having floors numbered from 1 to n. There are call buttons in the elevator corresponding to each floor. For every floor except floors 1 and n, there are two floor call buttons for the passengers to call elevator for going up and down. There is only one down call button at floor n and 1 up call button in floor 1. Then the car stops at a floor, the doors are opened and the elevator light indicating the current direction the elevator is going is illuminated so that the passengers can get to know the current moving direction of the elevator. When the elevator is moving music is audio is played inside the elevator. Draw class diagram, Activity diagram and component BTL5 Evaluate diagram for designing this system. | (15) | Evaluate | BTL-5 |
| 4. | Develop and draw the following UML diagrams for Airline Ticket reservation system.<br>(i) Sequence diagram (booking a ticket).<br>(ii) Activity diagram.<br>(iii) State chart diagram. | (5)<br>(5)<br>(5) | Create | BTL-6 |