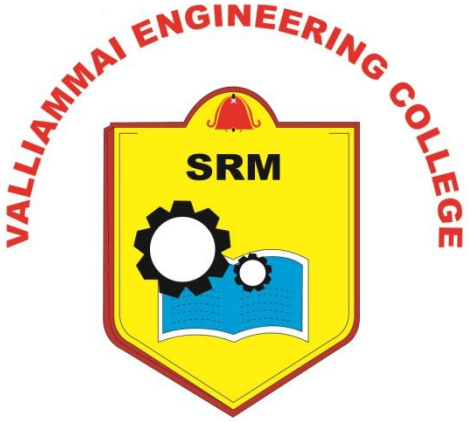
SRM VALLIAMMAI ENGINEERING COLLEGE

(An Autonomous Institution)

SRM Nagar, Kattankulathur – 603 203

DEPARTMENT OF INFORMATION TECHNOLOGY

QUESTION BANK



VI SEMESTER

1908008 - OBJECT ORIENTED ANALYSIS AND DESIGN

Regulation – 2019

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SUBJECT : 1908008- OBJECT ORIENTED ANALYSIS AND DESIGN

SEM / YEAR : VI Sem / III Year

UNIT I -UNIFIED PROCESS AND USE CASE DIAGRAMS

SYLLABUS: Introduction to OOAD with OO Basics - Unified Process – UML diagrams – Use Case – Case study – the Next Gen POS system, Inception -Use case Modelling – Relating Use cases – include, extend and generalization – When to use Use-cases.

PART-A

Q.No.	Question	Level	Competence
1	Define OOAD.	BTL1	Remember
2	What is Analysis and Design?	BTL1	Remember
3	Distinguish between method and messages in object.	BTL2	Understand
4	What is the main advantage of Object Oriented Development?	BTL1	Remember
5	Point out what test can help to find useful use cases?	BTL4	Analyze
6	Give the different formats of use cases.	BTL2	Understand
7	What is an object? Give an example	BTL1	Remember
8	What is UML? List out the UML Diagrams.	BTL1	Remember
9	Classify the kinds of actors in use case.	BTL4	Analyze
10	Define Unified Process(UP). List the 4 phases in UP.	BTL1	Remember
11	Illustrate the concepts of Generalization Relationship.	BTL3	Apply
12	Compare Include and Extend use case relationships.	BTL4	Analyze
13	Describe POS system and list the components of POS system.	BTL2	Understand
14	Give the primary goals in the design of UML	BTL2	Understand
15	Illustrate the relationship used in Use case.	BTL3	Apply
16	What are the three ways and perspectives to Apply UML?	BTL3	Apply
17	Generalize the concepts of use case modeling.	BTL6	Create
18	When to use Use cases? Evaluate it.	BTL5	Evaluate
19	Generalize your views about inception in Use case.	BTL6	Create
20	Evaluate and Name the UML diagrams used for the following: a) Modeling Requirements b) Modeling Workflows c) Modeling behavior of an object. d) Interaction between groups of objects.	BTL5	Evaluate

PART-B

Q.No.	Question	Level	Competence
1	Discuss about UML. (13)	BTL2	Understanding
2	Briefly explain about the different phases of Unified Process with a neat diagram. (13)	BTL4	Analyze
3	Explain with an example, how Use Case Modeling is used to describe the functional requirements. Identify the actors, scenario and Use Case for the example. (13)	BTL4	Analyze
4	(i) Inspect the basic activities in OOA and explain how Use Case Modeling is useful in analysis. (8) (ii) Examine the guidelines for writing and finding Use Cases. (5)	BTL1	Remember
5	Write a problem statement for Library Management System. Perform the Object Oriented System Development and give the Use Case model for the same (use include, extend and generalization) and design the UML Use Case diagram for the same. (13)	BTL6	Create
6	Prepare& analyze a suitable example showing the various relationships used in Use Case and also give a short note on each relationship. (13)	BTL4	Analyze
7	List the various UML diagram and explain about the UML diagrams in detail with neat diagrams. (13)	BTL1	Remember
8	Describe the following (i) UP disciplines (5) (ii) OOA and OOD (4) (iii) Abstract and Base Use Case (4)	BTL1	Remember
9	What is a POS system? Summarize about Inception Phase. (13)	BTL2	Understand
10	(i) Illustrate the steps and explain how to find Use cases with an example. (8) (ii) Rank the 3 kinds of actors and explain the 3 common Use Case formats.(5)	BTL3	Apply
11	(i) Recall the various sections in the Use Case template with example. (8) (ii) List the guidelines to be followed when writing Use Case. (5)	BTL1	Remember
12	Explain the benefits and concepts of Use Case and Use Case model and evaluate the ATM system by relating Use Cases. (13)	BTL5	Evaluate
13	Discuss about the Use Case modeling with example. (13)	BTL1	Understand
14	Apply Use Case modeling for Payroll system in UML. (13)	BTL3	Apply

PART-C

Q.No.	Question	Level	Competence
1	(i) What is the Unified process? Is the UP iterative and incremental? Explain. (7) (ii) Design the use case diagram for the following specification: A coffee Vending machine dispenses coffee to customer's .Customers orders coffee by selecting a recipe from a set of recipe. Customer pay for the coffee using coin. Change is given back. The 'Service staff ' loads ingredients (coffee powder, milk, sugar, water and chocolate) into the coffee machine. The service staff can also add a recipe by indicating the name of the coffee, the units of coffee powder milk, sugar, water and chocolate to be added as well as the cost of the coffee. (8)	BTL5	Evaluate
2	A Library lends books and magazines to member, who is registered in the system. It also maintains the purchase of new books and magazines for the Library. A member can reserve a book or magazine that is not currently available in the library, so that when it is returned or purchased by the library, that person is notified. The library can easily create, replace and delete information about the books, members, and reservation in the system. The books transactions are stored in the database. The fine list while the member returns the book after the due date must be generated. Design	BTL6	Create

	the use case diagram and discover the users and actors of this system, and the interactions between them must be depicted. (15)		
3	Design and illustrate the use case model for activities involved in ordering food in a restaurant from the point when the customer enters a restaurant to the point when he leaves the restaurant. (15)	BTL6	Create
4	Explain the benefits and concepts of use case and use case model and analyze the relating use cases for ATM system. (15)	BTL4	Evaluate

UNIT II -DESIGN PATTERNS AND METHODOLOGY			
SYLLABUS: GRASP: Designing objects with responsibilities – Creator – Information expert – Low Coupling – High Cohesion – Controller Design Patterns – creational – factory method – structural – Bridge – Adapter – behavioural – Strategy – observer –Applying GoF design patterns – Mapping design to code – methodology – Survey – Rumbaugh, Booch, Jacobson Methods			
PART-A			
Q.No.	**Question**	**Level**	**Competence**
1.	Define Design Pattern.	BTL1	Remember
2.	Identify when a pattern is said to be a good pattern.	BTL3	Apply
3.	"A system must be loosely coupled and highly cohesive"-Justify.	BTL5	Evaluate
4	Organize the limitations of Factory Pattern.	BTL3	Apply
5.	Define modular design.	BTL1	Remember
6.	Analyze the situation to use Factory method pattern and its advantages.	BTL4	Analyze
7.	Generalize your view on creator	BTL6	Create
8.	Interpret the list of structural patterns used during design phase of software development.	BTL5	Evaluate
9.	Analyze the benefits of Low coupling.	BTL4	Analyze
10.	Interpret the need of Information Expert.	BTL2	Understand
11.	Compare and contrast coupling and cohesion.	BTL2	Understand
12.	What are the steps for mapping design to code?	BTL1	Remember
13.	Analyze as to which object oriented methodology is well suited for (i) Design (ii) Analysis (iii) Full life cycle (iv) Real time systems.	BTL4	Analyze
14.	Define Refactoring.	BTL1	Remember
15.	Generalize the Booch system development process.	BTL6	Create
16.	Outline the benefits and the types of adapter pattern.	BTL2	Understand
17.	Define Observer Pattern.	BTL1	Remember
18.	List the four phases of object oriented modeling Techniques (OMT).	BTL1	Remember
19.	Interpret the benefits of controller and give an outline on bloated controller.	BTL2	Understand

20.	Identify the benefits of bridge pattern.	BTL3	Apply

PART-B

Q.No.	Question	Level	Competence
1	What is GRASP? Describe the design patterns and principles used in it. (13)	BTL1	Remember
2	(i) Analyze the design principles in object modeling. (5) (ii) Examine in detail the GRASP method for designing objects with example.(8)	BTL4	Analyze
3	Identify your views about Structural patterns with suitable example. (13)	BTL3	Apply
4	Generalize your idea on Controller pattern with example and also write short note on bloated controller. (13)	BTL6	Create
5	Illustrate the following GRASP patterns: (i) Creator (3) (ii) Information Expert (4) (iii) Low coupling (3) (iv) High cohesion (3)	BTL2	Understand
6	Give an account on Factory method. (13)	BTL2	Understand
7	Identify and describe the patterns that can be used for the following. (i) To provide an interface for crating families of objects without specifying classes. (7) (ii) To ensure that a class has only one instance and provide a global point of access to it. (6)	BTL3	Apply
8	What are the steps involved in mapping design to code?Recall it with an example. (13)	BTL1	Remember
9	Describe in detail about Behavioral pattern. (13)	BTL1	Remember
10	Recall in detail about GOF Design pattern and describe it. (13)	BTL1	Remember
11	(i) Differentiate Adapter and Bridge pattern. (7) (ii) Analyze the concept of Singleton pattern. (6)	BTL4	Analyze
12	Summarize in detail about Rumbaugh method. (13)	BTL2	Understand
13	(i) Examine the diagrams associated with Booch Methodology. (7) (ii) Analyze and highlight the features of Jacobson methodology. (6)	BTL4	Analyze
14	(i) Compare cohesion and coupling with suitable example.(8) (ii) Evaluate and state the role and patterns while developing system design. (5)	BTL5	Evaluate

PART-C

Q.No.	Question	Level	Competence
1	Assess the various categories of Design pattern. Explain the creational pattern by using with Maze game. (15)	BTL5	Evaluate
2	Generalize the design principles in object modeling. Explain in detail the GRASP methods for designing objects and Describe about the implementation model (Mapping design to code) and give the NextGen POS program solution. (15)	BTL6	Create
3	Summarize the Observer pattern for a problem of your choice and discuss about the solution with neat diagram. (15)	BTL6	Create
4	Explain Jacobson and Rumbaugh methodology and compare it to Booch methodology. In which aspect Booch analysis is successful? (15)	BTL5	Evaluate

UNIT III -STATIC UML DIAGRAMS

SYLLABUS: 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

Q.No.	Question	Level	Competence
1	Define Class diagram.	BTL1	Remember
2	List the relationships used in class diagram.	BTL1	Remember
3	What is an attribute? Mention its types.	BTL1	Remember
4	What do you mean by sequence number in UML? Analyze Where and for what it is used?	BTL4	Analyze
5	Express the meaning of Elaboration and What are the tasks performed in elaboration?	BTL2	Understand
6	Express why we call a domain model a “Visual Dictionary".	BTL2	Understand
7	Define Domain Model. How to create a Domain model?	BTL6	Create
8	Define Conceptual class.	BTL1	Remember
9	Rank the 3 strategies to find conceptual class.	BTL5	Evaluate
10	Differentiate aggregation and composition.	BTL4	Analyze
11	Estimate the purpose of association relationship.	BTL6	Create
12	Give the meaning of abstract conceptual class	BTL1	Remember
13	Identify the usage of Description class.	BTL3	Apply
14	Organize the guideline to partition a class into subclass.	BTL3	Apply
15	Illustrate When to use class diagram.	BTL2	Understand
16	When to define new data type classes?	BTL1	Remember
17	Interpret the meaning of Generalization.	BTL2	Understand
18	Compare qualified association and reflexive association.	BTL5	Evaluate
19	Experiment with an example how to name an association in UML with its guidelines.	BTL3	Apply
20	Distinguish sequence diagram and Use case diagram.	BTL4	Analyze

PART-B

Q.No.	Question	Level	Competence
1	What is System Sequence Diagram? Illustrate the relationship between sequence diagram and Use Case with example. (13)	BTL4	Analyze
2	Design the class diagram for Airline Reservation System. Find and draw the conceptual classes for the same. (13)	BTL6	Create
3	Summarize the Elaboration phase. Discuss the difference between elaboration and inception with example. (13)	BTL2	Understand
4	(i) Describe the strategies used to identify the conceptual classes.(10) (ii) Mention the steps to create a domain model used for representing the conceptual classes. (3)	BTL2	Understand
5	(i)Illustrate the concepts of Domain model with example. (8) (ii)Show when to model with Description classes with example. (5)	BTL3	Apply

6	For the Next Gen POS systems design, summarize the following Conceptual class hierarchies. (i) Conceptual super class (3) (ii) (ii)Conceptual subclass (3) (iii) Authorization Transaction classes. (3) (iv) Abstract Conceptual classes. (4)	BTL5	Evaluate
7	(i) Describe the UML notation for class diagram with example. (7) (ii) Describe the concepts of link, association and Inheritance. (6)	BTL1	Remember
8	Discuss about attributes with example. (13)	BTL2	Understand
9	Explain in detail about domain Model refinement. (13)	BTL4	Analyze
10	Analyze the guidelines to define a conceptual subclass and conceptual super class with suitable example. (13)	BTL4	Analyze
11	What are the guidelines used to partition the classes in the domain model to be organized into packages? Explain with suitable examples. (13)	BTL1	Remember
12	Discuss on (i) Active Class (4) (ii) User Defined compartments (3) (iii) Singleton class (3) (iv) Interfaces (3)	BTL1	Remember
13	Describe briefly about association classes and association role. (13)	BTL1	Remember
14	(i) Illustrate about aggregation and composition with example. (10) (ii) Mention the guidelines to be followed. (3)	BTL3	Apply

PART-C

Q.No.	Question	Level	Competence
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)	BTL5	Evaluate
2	A University conducts examinations and the results are announced. Prepare a report for the following. • Print the marks in the register number order semester wise for each department • Print the Arrear list semester wise. • Prepare a Rank list for each department. • Prepare the final aggregate mark list for final year students. Identify the problem statement and Design and Explain the classes for each sequence. Design the Use case, Class, and Sequence diagrams for designing this system. (15)	BTL6	Create
3	Construct design for Library Information System which comprises the following notations and explain them. (i) Aggregation (5) (ii) Composition (5) (iii) Association (5)	BTL6	Create
4	Design the Class diagram for Hospital management system? Find and draw conceptual classes for the same? (13)	BTL5	Evaluate

UNIT IV -DYNAMIC AND IMPLEMENTATION UML DIAGRAMS

SYLLABUS: 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 Diagrams - UML package diagram - When to use package diagrams - Component and Deployment Diagrams – When to use Component and Deployment diagrams

PART-A

Q.No.	Question	Level	Competence
1	Express the use of Sequence Diagram.	BTL2	Understand
2	Compare sequence diagram and collaboration diagram.	BTL2	Understand
3	Identify what is by System Behavior? How to name System events and Operations.	BTL3	Apply
4	Define Event, State and Transition.	BTL1	Remember
5	Define Package. Mention the three layers of package diagram.	BTL1	Remember
6	Analyze the use of UML Package Diagram	BTL4	Analyze
7	List the common notations used in interaction diagram	BTL1	Remember
8	Create a state machine diagram for Process Sale.	BTL6	Create
9	Define Component.	BTL1	Remember
10	Demonstrate the similarities and dissimilarities of state independent and State dependent objects.	BTL2	Understand
11	Compare and Contrast Component and Deployment diagram	BTL5	Evaluate
12	Mention the purpose of Activity diagram and specify its elements.	BTL1	Remember
13	Name the basic elements of a Deployment diagram.	BTL1	Remember
14	Organize and Show the relationship between Interaction and Class diagram with example.	BTL3	Apply
15	Outline the need for State Diagram.	BTL2	Understand
16	Differentiate Class diagram and Interaction diagram.	BTL4	Analyze
17	Experiment the term Classifier with an example.	BTL3	Apply
18	Create SSD for Borrow book scenario.	BTL6	Create
19	Justify the use of rake symbol with an example.	BTL5	Evaluate
20	Compare and Contrast asynchronous and synchronous message.	BTL4	Analyze

PART-B

Q.No.	Question	Level	Competence
1	Summarize with an example, how Interaction Diagram are used to model the dynamic aspects of a system. (13)	BTL2	Understand
2	Describe the basic Communication diagram notations. (13)	BTL1	Remember
3	Illustrate about UML Deployment and Component diagram with an example. (13)	BTL2	Understand
4	Interpret about UML state machine diagram and Modeling. (13)	BTL2	Understand
5	Compare sequence diagram and communication diagram with suitable example.(13)	BTL4	Analyze
6	(i) Analyze the UML activity diagram, using an example point out the features of basic UML activity diagram notation. (8) (ii) Inspect the constructs (notations) used in an activity diagram? (5)	BTL4	Analyze

7	(i) What is the purpose of State Chart diagram (4) (ii) Recall how to draw state chart diagram with an example. (9)	BTL2	Remember
8	(i) Design and explain the activity diagram for an Online Purchase System. (7) (ii) Represent the activity diagram for the following Scenario, Booking a ticket on Indian railways e-ticket system (IRCTC). (6)	BTL6	Creating
9	Describe briefly about logical architecture and UML package diagram. (13)	BTL1	Remember
10	(i) What is SSD? Determine the notations used in sequence diagram. (5) (ii) Determine SSD for Library Management System. (8)	BTL5	Evaluate
11	(i) When to use activity diagrams. (3) (ii) Describe the Implementation diagrams with example. (10)	BTL1	Remember
12	Examine briefly about UML sequence diagram notations with example. (13)	BTL4	Analyze
13	(i) Identify when to use UML deployment and Component diagrams. (7) (ii) Draw the diagrams for banking applications. (6)	BTL3	Apply
14	With an example make ue of the notations used in sequence diagram for the following: (i) Object destruction (2) (ii) Frames (2) (iii) Conditional message (3) (iv) Mutually exclusive conditional message (3) (v) Iterations over a collection (3)	BTL3	Apply

PART-C

Q.No.	Question	Level	Competence
1	Consider the Hospital Management System application with the following requirement (i) System should handle the in- patient and out-patient information through receptionist. (ii) Doctors are allowed to view the patient history and give their prescription. (iii) There should be an Information system to provide the required information. Give the state chart, Component and Deployment diagram. (5+5+5)	BTL6	Create
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 PIN number. Show the Use Case representation for the same and summarize the "Validate User" Use Case using sequence diagram. Assess and represent the activity diagram for the same. (15)	BTL5	Evaluate
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)		
4	Develop and draw the following UML diagrams for Airline Ticket reservation system. (i) Sequence diagram (booking a ticket). (5) (ii) Activity diagram. (5) (iii) State chart diagram. (5)	BTL6	Create

UNIT V TESTING			
SYLLABUS: Object Oriented Methodologies – Software Quality Assurance – Impact of object orientation on Testing – Develop Test Cases and Test Plans ,CASE STUDY: Health care, Student Marks Analysing system, CASE studies Tools: Star UML/ UML			
PART-A			
Q.No.	**Question**	**Level**	**Competence**
1	List out the Myer's debugging principles.	BTL1	Remember
2	Outline the term SQA.	BTL2	Understand
3	Summarize the main tools of Quality Assurance	BTL2	Understand
4	Illustrate the impact object orientation in testing.	BTL3	Apply
5	Define the term Object interoperability.	BTL1	Remember
6	Interpret the basic activities are performed in using debugging tool.	BTL5	Evaluate
7	Define test plan? What are its components?	BTL1	Remember
8	Formulate the need of quality assurance.	BTL6	Create
9	Show the Booch methodology diagrams.	BTL2	Understand
10	Define black box testing?	BTL1	Remember
11	Illustrate the different kinds of errors you might encounter when you run your program.	BTL3	Apply
12	List out the Testing strategies.	BTL1	Remember
13	Analyze as to which object oriented methodology is well suited for (i) Design (ii) Analysis (iii) Full life cycle (iv) Real time systems	BTL4	Analyze
14	Analyze the Jacobson methodology.	BTL4	Analyze
15	Illustrate the steps needed to create a test plan.	BTL3	Apply
16	Estimate and generalize the concepts of implication of Inheritance.	BTL6	Create
17	Interpret the four phases of object oriented modeling Techniques (OMT).	BTL2	Understand
18	Analyze the CASE tools and where it is used?	BTL4	Analyze
19	Compare RumBaugh methodology and Booch methodology.	BTL5	Evaluate
20	What are test cases? List the guidelines for developing quality assurance test cases.	BTL1	Remember

PART-B

Q.No.	**Question**	**Level**	**Competence**

1	Explain Booch's methodology of object oriented analysis and design. (13)	BTL5	Evaluate
2	Illustrate the significance of object orientation testing. (13)	BTL2	Understand
3	Examine the Myer's debugging principles. (13)	BTL4	Analyze
4	Summarize the different testing strategies. How to develop test plans guided by Thomas. (13)	BTL2	Understand
5	(i) List the guidelines for developing quality assurance test cases. (7) (ii) What is statement and branch testing coverage in object oriented testing? Explain.(6)	BTL1	Remember
6	Discover the importance of (i) Object oriented Business Engineering (7) (ii) Object oriented Software Engineering (6)	BTL4	Analyze
7	(i) Sketch the guidelines for developing quality assurance Test cases described by Freedman and Thomas adapted for the UA. (7) (ii) Identify the steps involved to make the testing successful? (6)	BTL3	Apply
8	Define test plan. List out the steps are followed in developing a test plan? (13)	BTL1	Remember
9	Describe the following: (i) Guideline for developing a user satisfaction test. (3) (ii) White box testing (4) (iii) Black box testing (4) (iv) Debugging (2)	BTL1	Remember
10	Formulate the different test cases to estimate about the Student Marks Analysis system. (13)	BTL6	Create
11	Why do we follow standards particularly for testing any Quality Assurance (QA)? (13)	BTL1	Remember
12	(i) Why is a Unified approach to software development necessary? Interpret it. (7) (ii) Outline in detail about Object oriented Modeling Techniques (OMT). (6)	BTL2	Understand
13	(i) Compare and Contrast the object oriented methodology of Booch, Rumbaugh and Jacobson. (7) (ii) Examine about a Unified approach to software development. (6)	BTL4	Analyze
14	(i) Experiment the diagrams associated with Booch Methodology. (7) (ii) Identify and highlight the features of Jacobson methodologies. (6)	BTL3	Apply

PART-C

Q.No.	Question	Level	Competence
1	Explain the various testing strategies for Software quality assurance. (15)	BTL5	Evaluate
2	Evaluate the Unit, Integration, and system testing for currency converter application. (15)	BTL5	Evaluate
3	Develop the test cases for the Net bank ATM System. (15)	BTL 6	Create
4	Develop a healthcare system using Star UML. Highlight the features of Star UML. (15)	BTL 6	Create