INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)
Dundigal, Hyderabad - 500 043

INFORMATION TECHNOLOGY

TUTORIAL QUESTION BANK

Course Title	**OBJECT ORIENTED ANALYSIS AND DESIGN**			
Course Code	**A60524**			
Regulation	**R15 - JNTUH**			
Course Structure	Lectures	Tutorials	Practicals	Credits
	4	-	-	4
Course Coordinator	Mr. E.Sunil Reddy, Assistant Professor. IT			
Team of Instructors	Mr. E.Sunil Reddy, Assistant Professor. IT			

OBJECTIVES

To meet the challenge of ensuring excellence in engineering education, the issue of quality needs to be addressed, debated and taken forward in a systematic manner. Accreditation is the principal means of quality assurance in higher education. The major emphasis of accreditation process is to measure the outcomes of the program that is being accredited.

In line with this, Faculty of Institute of Aeronautical Engineering, Hyderabad has taken a lead in incorporating philosophy of outcome based education in the process of problem solving and career development. So, all students of the institute should understand the depth and approach of course to be taught through this question bank, which will enhance learner's learning process.

S. No	Question	Blooms Taxonomy Level	Course Outcome
	UNIT – I **Introduction to UML**		
	PART - A (Short Answer Questions)		
1	Define Unified Modeling Language.	Remember	1
2	Write short notes on modeling.	Understand	2
3	List static and dynamic diagrams in UML.	Remember	1
4	State the goals of UML.	Remember	2
5	Define Object.	Remember	1
6	Define the basic building blocks of UML.	Remember	2
7	Write short notes on the things in UML.	Understand	2
8	Classify structural things.	Understand	1
9	Classify behavioral things in UML.	Understand	1
10	Define grouping things.	Remember	2
11	List out the views existing in software architecture.	Remember	2
12	Define an Interface.	Understand	2
13	Define collaboration.	Remember	1
14	List out the phases existing in SDLC.	Remember	1
15	Write short notes on active class.	Understand	2
16	List the types of relationships.	Understand	2
17	Define component.	Remember	1
18	List out the processes existing in SDLC.	Understand	1
19	Define encapsulation.	Understand	2

20	Define data Hiding.	Remember	2
21	Define polymorphism.	Understand	1
22	Define Modularity.	Remember	2
23	Define Abstraction.	Understand	2
24	List out the application Areas of UML.	Remember	1
25	Define Use case.	Remember	2
26	Define Node.	Understand	1
27	Describe interactions.	Understand	2
28	Describe Package.	Remember	1
PART-B (Long Answer Questions)			
1	Explain Briefly overview of the UML.	Understand	1
2	Discuss The Importance of the UML.	Remember	2
3	Discuss The principles of Modeling of UML.	Understand	2
4	Explain Briefly object-oriented modeling in UML.	Understand	1
5	Explain Briefly Things in UML.	Remember	2
6	Discuss Various Relationships with UML Notation.	Understand	2
7	Explain The Structural Diagrams in UML.	Understand	1
8	Explain The Behavioral Diagrams in UML.	Understand	2
9	Explain Software architecture in the UML.	Remember	1
10	Explain Briefly on Software Development Life Cycle.	Remember	2
11	Define a model and what the aims of modeling.	Understand	1
12	Explain The Application Areas of UML.	Remember	1
13	Discuss The Rules of UML.	Understand	2
14	Discuss The Structural thing and Grouping things in UML.	Understand	2
15	Discuss The Behavioral thing and Annotational things in UML.	Understand	1
PART-C (Analytical Questions)			
1	Explain Software Development Life Cycle (SDLC)? What are the phases (stages) of it? Which phase requires maximum efforts? Also explain why domain analysis i.e. domain class model, domain state model and domain interaction model is important.	Understand	1
2	Illustrate out evolution of UML.	Understand	2
3	Explain the 3 ways to Understand UML.	Understand	2
4	Describe Unified process.	Understand	1
5	Explain the importance of Unified process.	Understand	2
UNIT-II **Basic Structural Modeling, Advanced Structural Modeling, Class and Object Diagrams**			
PART – A (Short Answer Questions)			
1	Define classes.	Remember	4
2	List the properties of a class.	Understand	5
3	State an attribute.	Remember	5
4	Define responsibilities.	Remember	3
5	List out the Multiplicity types.	Understand	3
6	List out the adornments which apply to association.	Remember	4
7	Define dependency.	Remember	4
8	Define generalization.	Remember	4
9	Write short notes on association.	Understand	4
10	Discuss about aggregation.	Understand	5
11	Define object diagram.	Remember	4
12	Define component diagram.	Understand	4
13	Define use case diagram.	Understand	5
14	Define note.	Remember	5
15	Define stereotypes.	Remember	3
16	List tagged values.	Remember	4

17	Write short notes on constraints.	Understand	5
18	Illustrate how to model comment.	Understand	3
19	Define sequence and collaboration diagrams.	Remember	4
20	Define state chart and Activity diagrams.	Understand	5
21	Discuss about class diagram.	Understand	5
22	Define classifier.	Remember	2
23	List out contents of class diagram.	Remember	3
24	Define visibility.	Understand	4
25	Discuss scope.	Understand	1
26	Define Abstract and Root.	Understand	2
27	Explain Template class.	Understand	3
28	Define Standard elements.	Remember	5
31	List out the stereotypes applicable to dependency.	Remember	2
32	Define an object.	Understand	1
33	List out the constraints applicable to generalization.	Understand	2
34	List out the constraints applicable to Association.	Remember	2
35	Define realization relationship.	Understand	3
36	Describe interface.	Understand	5
37	Define a package.	Understand	4
38	List out the contents of class diagram.	Remember	5
PART-B (Long Answer Questions)			
1	Explain Briefly Names, Attributes, Operations and Responsibilities in a Classes.	Understand	3
2	Explain Briefly on Modeling the vocabulary of a system and Modeling the Distribution of responsibilities in a system.	Understand	4
3	Discuss Names, Role, Multiplicity and Aggregation with examples in Relationships.	Remember	5
4	Explain Briefly on Modeling simple dependencies and Modeling single inheritance	Remember	4
5	Explain Briefly Common Mechanisms in Basic Structural modeling.	Remember	5
6	Explain Briefly on Modeling comments and Modeling new building blocks	Remember	4
7	Explain Briefly Diagrams in UML.	Understand	5
8	Explain Briefly on Modeling different views of a system and Modeling Different levels of abstraction.	Remember	5
9	Discuss Classifiers, Visibility, Abstract, Root, Leaf with examples.	Understand	5
10	Describe Multiplicity, Attribute, Operations, Template class and Standard Elements.	Understand	4
11	Explain on Modeling the semantics of a class .	Understand	4
12	Discuss the stereotypes which are applicable to dependency in Advanced Relation Ships.	Remember	5
13	Discuss the constraints which are applicable to Generalization Relationship.	Understand	4
14	Explain Briefly Navigation, Visibility and Qualification Association Relationship.	Understand	5
15	Explain Briefly composition, Association class and Constraints.	Remember	4
16	Explain Briefly on Modeling webs of relationships.	Remember	4
17	Explain Briefly Interfaces, Types and Roles.	Remember	5
18	Explain Briefly Modeling the seams in a systems and modeling static And dynamic types.	Understand	3
19	Define Package and Explain Terms and concepts of packages.	Understand	5
20	Explain Briefly Modeling groups of elements and Modeling Architectural views.	Remember	2
21	Explain Briefly Classes, Interfaces, Collaborations and Relationships.	Understand	4

22	Explain Briefly Modeling simple collaborations and modeling Logical Database Schema.	Remember	5
23	Explain Briefly Modeling object structure and Results of forward and Reverse Engineering.	Understand	5
PART-C (Analytical Questions)			
1	Design a Class Diagram of a Cellular Network.	Understand	
2	Define an abstract class? Mention its use. Can concrete class be a super class? If yes, give example, if no, give reason.	Remember	3
3	Explain any four standard constraints that Understand to generalization relationships.	Understand	5
4	Design a Class Diagram for Hospital Information system.		
5	Design a Class Diagram for Railway Reservation System.		
6	Design a Class Diagram for a school Information system.		
7	Discuss the stereotype applied to generalization relationships? Give a brief.	Understand	5
8	Draw object diagram that contains a three-level Hierarchy of objects.	Understand	4
9	Briefly explain the four adornments that Understand to all association.	Understand	5
10	Enumerate the steps to model webs of relationships.	Remember	3
11	Model the relationship between a car (that has an engine and a color) and its owners (having a name) in a UML class diagram. A car can have several owners over time, but only one or none owner at a time. Do not forget cardinalities, role names, attributes and their types.	Understand	2
12	Design class diagram for ATM.	Understand	3
13	Design class diagram for Library Management system.	Understand	3
14	Design object diagram for ATM.	Understand	2
15	Design object diagram for Library Management system.	Understand	5
UNIT – III **Basic Behavioral Modeling , Basic Behavioral Modeling – II**			
PART - A (Short Answer Questions)			
1	Define interactions.	Remember	5
2	Write short notes about context.	Understand	3
3	Discuss about Links in Interactions.	Remember	6
4	Discuss about categorized Messages.	Understand	2
5	Discuss about Sequencing.	Remember	3
6	Discuss Procedural flow control.	Understand	5
7	Discuss Flat Flow of Control.	Remember	2
8	Define Modeling a Flow Control.	Remember	5
9	Discuss Interaction of objects in context of a class.	Understand	3
10	Discuss Interaction of objects in context of operation.	Remember	6
11	Discuss Interaction of objects in context of System or Subsystem.	Understand	5
12	Define Common Properties in Interaction Diagrams.	Understand	4
13	Define Contents in Interaction Diagrams.	Remember	3
14	Define objects in Interaction Diagrams.	Understand	2
15	Define Links and Messages in Interaction Diagrams.	Remember	6
16	Define Synchronous and Asynchronous Messages in Interaction Diagrams.	Remember	5
17	Define Sequence Diagram.	Remember	4
18	Define Collaboration Diagram.	Understand	2
19	Discuss the Semantic Equivalence between interactions Diagram.	Remember	6
20	List out the Differences between interaction Diagrams.	Understand	5
21	Define Object Life Line.	Understand	4
22	Define Focus of Control.	Remember	6
23	Define Path in Collaboration Diagram.	Understand	3
24	Define Sequence Number in Collaboration Diagram.	Understand	2

25	List out the types of common Modeling Techniques in interaction Diagrams.	Understand	5
1	Define Use cases with example.	Understand	2
2	Discuss Notation for Describing Use Cases.	Understand	3
3	Discuss Use cases and Flow of Events.	Understand	3
4	Discuss Use cases and Scenarios.	Understand	2
5	Discuss Use cases and Collaborations.	Remember	5
6	Define How to organizing Collaborations.	Understand	5
7	Define Include Relationship in use cases.	Remember	2
8	Define Extend Relationship in use cases.	Understand	3
9	Discuss Use case Diagrams.	Understand	2
10	Discuss Common Properties in Use case Diagrams.	Remember	4
11	Define Contents of use case Diagrams.	Understand	2
12	List out the Uses of Use case Diagram.	Remember	6
13	List out the common Modeling techniques of Use case Diagram.	Remember	5
14	Define Activity Diagrams.	Remember	4
15	Define Action States in Activity Diagrams.	Understand	6
16	Define Activity States in Activity Diagrams.	Remember	3
17	Discuss Branching In Activity Diagrams.	Understand	2
18	Discuss Forking with symbol.	Understand	5
19	Discuss Joining with symbol.	Understand	3
20	Define Swim lanes.	Remember	6
21	Define Object Flow In Activity Diagrams.	Understand	5
22	List out the types of common modeling techniques In Activity Diagrams.	Understand	4
PART-B (Long Answer Questions)			
1	Explain context, Links, Messages and Sequencing in interactions.	Understand	5
2	Explain Modeling a flow of control in interactions.	Remember	4
3	Discuss Common properties, Contents, Sequence diagram and Collaboration Diagrams.	Remember	3
4	Discuss the Semantic equivalence between interaction diagrams and Differences between sequence and collaboration diagrams.	Understand	7
5	Explain Modeling flows of control by time ordering and Modeling flow of control by organization.	Understand	7
6	Define Use case. Explain Names, use cases and actors.	Understand	5
7	Explain Use case and flow of events, Use cases and scenarios and use cases and collaborations	Remember	8
8	Explain Briefly How to organizing use cases.	Remember	5
9	Explain Modeling the behavior of an element.	Understand	3
10	Define use case Diagrams. Explain Common properties, contents and Common uses.	Remember	7
11	Explain Modeling the context of a system and modeling the requirements of A system.	Understand	4
12	Define Activity Diagrams. Explain Action states and activity states.	Remember	8
13	Describe Transition, Branching, Forking and Joining.	Remember	6
14	Describe Swim lanes, Object flow.	Understand	5
15	Explain Modeling a workflow and Modeling an operation.	Understand	4
PART-C (Analytical Questions)			
1	Design a railway reservation system using Sequence and Collaboration Diagram.	Understand	5
2	Design a collaboration Diagram that specifies the flow of control involved in registering a new student at a school.	Understand	6

3	Design sequence diagram for ATM.	Remember	4
4	Design collaboration diagram for ATM.	Remember	5
5	Design sequence diagram for Library Management system.	Remember	3
6	Design collaboration diagram for Library Management system.	Remember	4
7	Compare class and sequence diagram.	Remember	5
8	Design sequence diagram for online shopping.	Understand	3
9	Describe activity diagram for restaurant.	Remember	8
10	Describe activity diagram for hotel canteen.	Remember	5
11	Describe use case diagram for restaurant.	Understand	4
12	Describe use case diagram for library.	Understand	2
13	Describe use case diagram for company.	Understand	3
14	Describe activity diagram for library.	Understand	5
15	Describe activity diagram for online shopping.	Understand	3
	UNIT – IV **Advanced Behavioral Modeling , Architectural Modeling**		
	PART - A (Short Answer Questions)		
1	Define call Events.	Remember	5
2	Define event and signal.	Understand	4
3	Define time event.	Remember	5
4	Define change event.	Understand	3
5	Define sending/receiving events.	Understand	2
6	Discuss states and state parts.	Remember	8
7	Discuss Event trigger.	Understand	4
8	State Guard condition.	Remember	5
9	Define state Machine.	Understand	2
10	Discuss transitions and transition elements.	Remember	5
11	Define Node.	Understand	5
12	Define process and threads.	Understand	5
13	Describe flow of control.	Understand	4
14	Discuss the contents of component diagrams.	Remember	3
15	Define time and space.	Understand	3
16	Define component.	Remember	5
17	Explain state chart diagram.	Understand	4
18	Discuss the properties of components.	Remember	10
19	Define Deployment diagram.	Understand	4
20	Explain the contents of component diagram.	Understand	4
21	Describe substrates and substrates classification in state machines.	Remember	9
	PART-B (Long Answer Questions)		
1	Explain Signals, Call Events, Time Events, Change Events and Sending/ Receiving Events.	Understand	5
2	Explain Modeling a family of Signals and Modeling Exceptions.	Remember	8
3	Define State Machines. Explain States, Initial and Final states.	Remember	8
4	Explain Transitions and Advanced States and Transitions and Substrates.	Understand	9
5	Explain Modeling the lifetime of an object.	Understand	9
6	Define Process and Threads. Explain Flow of Control, Classes and Events.	Remember	5
7	Explain Standard elements, communication and Synchronization.	Understand	3
8	Explain Modeling Multiple flows of Control and Modeling Inter-process Communication.	Understand	3
9	Define Time and Space. Explain Location.	Remember	5
10	Explain Modeling Timing Constraints and Modeling the Distribution of Objects.	Understand	3

11	Define State chart diagrams. Explain contents and common Uses in State chart diagrams.	Remember	4
12	Explain Modeling Reactive objects and Forward and Reverse Engineering.	Understand	4
13	Define Components. Explain Names, Components and Classes, Components and interfaces.	Remember	5
14	Explain Kinds of components, Organizing components and properties in Components.	Understand	2
15	Explain Modeling Executables and Libraries, Modeling an API.	Understand	4
16	Explain Modeling Tables, Files and Documents, Modeling Source code.	Understand	4
17	Define Deployment. Explain Names, Nodes and Components.	Remember	5
18	Explain Modeling Processors and Devices, Modeling the Distribution of Components.	Understand	5
19	Define Component Diagrams. Explain Common Properties, contents and Common Uses.	Remember	4
20	Explain Modeling Source code and Modeling an Executable release.	Understand	5
21	Explain Modeling a Physical Database and Modeling Adaptable Systems.	Understand	6
22	Define Deployment diagrams. Explain Contents and Common uses.	Remember	3
23	Explain Briefly on Modeling an Embedded system and Modeling a Client/Server system.	Understand	4

PART-C (Analytical Questions)

1	Design a state chart Diagram for the student object, who applies, takes admission and finally graduates.	Understand	10
2	Design a state Machine for the controller in a home security system, which is responsible for monitoring various sensors around the perimeter of the house.	Understand	10
3	Describe state chart diagram for telephone line.	Remember	8
4	Describe state chart diagram for restaurant.	Remember	4
5	Describe state chart diagram for school.	Remember	5
6	Describe state chart diagram for library.	Understand	7
7	Describe state chart diagram for atm.	Remember	3
8	Describe state chart diagram for online shopping.	Understand	5
9	Describe component diagram for restaurant.	Understand	4
10	Describe deployment diagram for restaurant.	Remember	5
11	Describe component diagram for library.	Understand	4
12	Describe deployment diagram for atm.	Understand	5
13	Explain how UML flows in actual project.	Remember	4

UNIT – V

Patterns and Frameworks, Artifact Diagrams, Case Study: The Unified Library application.

PART - A (Short Answer Questions)

1	Define Framework.	Understand	5
2	Define Patterns.	Understand	4
3	Explain problem statement for unified library application.	Remember	8
4	Define Mechanism.	Understand	8
5	Discuss actors in library application.	Remember	5
6	Design classes in library application.	Understand	4
7	Illustrate objects in library application.	Understand	4
8	Design use cases in library application.	Understand	5
9	Discuss action states in library application.	Remember	9
10	Define use case for librarian.	Understand	9
11	State nodes in library.	Understand	5
12	Compare sequence and collaboration in library application.	Remember	4
13	Write a short notes on packages in library application	Remember	9

PART-B (Long Answer Questions)			
1	Enumerate the steps to model design patterns. Illustrate with a UML diagram	Understand	5
2	Enumerate the steps to model architectural patterns. Illustrate with a UML diagram	Understand	5
3	Define Framework. Illustrate framework with a UML diagram.	Remember	4
4	Explain Patterns and Architecture.	Remember	10
5	Design class diagram for library Application.	Understand	4
6	Design object diagram for library Application.	Remember	5
7	Design use cases diagram for library Application.	Understand	5
8	Design sequence diagram for library Application.	Remember	4
9	Design collaboration diagram for library Application.	Understand	4
10	Design activity diagram for library Application.	Understand	10
11	Design component diagram for library Application.	Remember	10
12	Design deployment diagram for library Application.	Understand	5
13	Design Class diagram with common mechanisms for	Remember	5
14	Design a sequence diagram for the use case lend item.	Understand	4
15	Draw a class diagram of business objects in the design model.	Remember	4
PART-C (Analytical Questions)			
1	Define framework. Illustrate framework with UML diagram.	Remember	5
2	Demonstrate classes in class diagram	Understand	4
3	Demonstrate actors and use cases in sequence diagram	Understand	5
4	Demonstrate components in library system	Understand	4
5	Draw a sequence diagram for the Add title use case.	Understand	5
6	Explain the Process of building a domain model.	Understand	10
7	Draw a class diagram of business objects in the design model and explain.	Understand	5
8	Discuss nodes in library management system	Remember	4
9	Explain active object in library system	Remember	4
10	Explain systems used in deployment diagram of library system	Remember	5
11	Describe activity diagram to inform a person when a loan is due.	Remember	5
12	Design class diagram for user interface classes in the functions menu and explain.	Remember	10

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