

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous) Dundigal, Hyderabad-500043

INFORMATION TECHNOLOGY

TUTORIAL QUESTION BANK

Course Title OBJECT ORIENTED ANALYSIS AND DESIGN						
Course Code	ACS009)				
Programme	B.Tech					
Semester	v	IT				
Course Type	Core					
Regulation	IARE - R16					
	Theory Practical			al		
Course Structure	Lectur	es	Tutorials	Credits	Laboratory	Credits
	3		-	3	-	-
Chief Coordinator	Mr. N Bhaswanth, Assistant Professor					
Course Faculty	Mr. G Chandra Sekhar, Assistant Professor					

COURSE OBJECTIVES:

The course should enable the students to:				
I.	Develop the skills to analyze and design object-oriented problems.			
II.	Create design patterns to solve problems based on object oriented concepts.			
III.	Understand the various processes and techniques for building object-oriented software systems.			
IV.	Prepare unified modeling techniques for case studies.			

COURSE OUTCOMES (COs):

CO 1	Discuss the overview of object oriented modeling and benefits of each.
CO 2	Differentiate advance object-oriented approach from the traditional approach for design and
	development of System.
CO 3	Understand Unified Modeling Language (UML) for representation of an object-oriented system using
	different modeling views.
CO 4	Apply appropriate design patterns to model or design of the system.
CO 5	Apply various software architectures, including frameworks and design patterns, when developing
	software projects.

COURSE LEARNING OUTCOMES (CLOs):

ACS009.01	Able to show the importance of modeling concept for object oriented development in system.
ACS009.02	Demonstrate the Conceptual model of UML and SDLC.
ACS009.03	Able to understand the role and function of each UML model in software development using object- oriented approach.
ACS009.04	Illustrate the importance of classes and their associated relationships by understanding various common mechanisms.
ACS009.05	Able to differentiate advance object-oriented approach from the traditional approach for design and development of System.
ACS009.06	Analyze the Objects and Classes are required for the development of software system.
ACS009.07	Creation of interaction diagram that model the dynamic aspects of a software system.
ACS009.08	Use case and activity studies to illustrate the analysis and design concepts.
ACS009.09	Identify, analyze, and model behavioral concepts of the system and also know the importance of events and signals and their modeling techniques.
ACS009.10	Analyze and understand the uses of process and threads and time and space to model and development of a system.
ACS009.11	Demonstrate state machines and state chart diagrams and their modeling techniques.
ACS009.12	Illustrate the uses of component and deployment diagram and their modeling techniques.
ACS009.13	Understands how to apply the pattern based analysis and design to the software to be developed.
ACS009.14	Describe how design patterns facilitate development and list several of the most popular patterns.
ACS009.15	Identify and describe design patterns and their application in a software design project.
ACS009.16	An Ability to refactor poorly designed solutions by using the appropriate design patterns.
ACS009.17	Develop UML models for design patterns using currently available software modeling tools.
ACS009.18	Evaluate and apply design patterns, architectural patterns and enterprise patterns to the development of software systems.
ACS009.19	Assess the use of Design patterns in the design of software systems and the refactoring of existing systems.
ACS009.20	Analyze software components and case studies of system architecture and determine how Integration with new and existing systems may be achieved.

TUTORIAL QUESTION BANK

UNIT- I					
STRUCTURAL MODELLING					
~ ~ ~ ~	Part - A (Short Answer Questions)		~	~	
S No	QUESTIONS	Blooms	Course	Course	
		Taxonomy	Outcomes	Learning	
		Level		(CLO ₂)	
1	Define Unified Modeling Language	Remember	CO 1	ACS009.01	
2	Write short notes on modeling	Understand	CO 1	ACS009.01	
3	List static and dynamic diagrams in UML.	Remember	CO 1	ACS009.01	
4	State the goals of UML	Remember	CO 1	ACS009.01	
5	Where can be the UML will be used?	Remember	CO 1	ACS009.02	
6	Define the basic building blocks of UML.	Remember	CO 1	ACS009.02	
7	Write short notes on the things in UML.	Understand	CO 1	ACS009.02	
8	Classify structural things.	Understand	CO 1	ACS009.02	
9	Classify behavioral things in UML.	Understand	CO 1	ACS009.02	
10	Define Annotational things.	Remember	CO 1	ACS009.02	
11	Define grouping things.	Remember	CO 1	ACS009.03	
12	List out the various rules of the UML.	Remember	CO 1	ACS009.03	
13	Write short notes on Extensibility mechanisms	Understand	CO 1	ACS009.03	
14	What is software architecture?	Remember	CO 1	ACS009.03	
15	List out the phases existing in SDLC.	Remember	CO 1	ACS009.03	
16	Write short notes on Class.	Understand	CO 1	ACS009.03	
17	Discuss about attributes and operations.	Understand	CO 1	ACS009.03	
18	What are responsibilities in classes?	Remember	CO 1	ACS009.03	
19	Define how we model the vocabulary of a system	Understand	CO 1	ACS009.03	
20	How we model non software things.	Understand	CO 1	ACS009.04	
21	What is Dependency and Generalization	Remember	CO 1	ACS009.04	
22	Write a short note on Association.	Understand	CO 1	ACS009.04	
23	How we model a Structural relationships discuss.	Remember	CO 1	ACS009.04	
24	What is Note? Discuss its importance.	Understand	CO 1	ACS009.04	
25	Write short notes on Adornments.	Remember	CO 1	ACS009.04	
26	What are Stereotypes?	Remember	CO 1	ACS009.04	
27	Illustrate the usage of Tagged Values.	Understand	CO 1	ACS009.04	
28	Classify the Structural diagrams.	Understand	CO 1	ACS009.04	
29	Classify the Behavioral diagrams	Remember	CO 1	ACS009.04	
	Part - B (Long Answer Questions)		1		
1	Explain briefly the overview of UML.	Understand	CO 1	ACS009.01	
2	Discuss in detail the importance of the UML.	Remember	CO 1	ACS009.01	
3	Demonstrate the various principles of Modeling in UML.	Understand	CO 1	ACS009.02	
4	Explain briefly the importance of object-oriented modeling in UML.	Understand	CO 1	ACS009.02	
5	Discuss in detail different kinds of things in UML.	Remember	CO 1	ACS009.02	
6	Illustrate various relationships with UML Notation.	Understand	CO 1	ACS009.03	
7	List and explain the Structural diagrams in UML.	Understand	COI	ACS009.03	
8	List and explain the Behavioral diagrams in UML.	Understand		AC\$009.03	
9	Explain Software architecture in the UML.	Remember		AC\$009.03	
10	What is Software Development Life Cycle? Explain in detail.	Remember		AC\$009.04	
11	Explain onerly about classes and its importance.	Derestand		AC\$009.04	
12	Explain any two common modeling techniques of classes.	Kemember		AC\$009.04	
15	List the terms and concepts of relationships.	Understand		AC\$009.04	
14	How we model a new building blocks	Remember		ACS009.04	
13	Dowt C (Ducklam Solving and Cuitical Thinking On		01	AC3009.04	
1	Fart - C (Frould Solving and Critical Ininking Qi Evalain Software Development Life Cycle (SDL C)? What are the phases	Understand	CO 1	AC\$000.01	
1	(stages) of it? Which phase requires maximum efforts?	Understand	01	AC5007.01	
2	Illustrate the evolution of UML.	Understand	CO 1	ACS009.02	

3	Discuss in detail a conceptual model of the UML.	Remember	CO 1	ACS009.02
4	Explain the term and concepts of classes.	Understand	CO 1	ACS009.03
5	What is the use of Diagram? Explain different diagrams in UML	Remember	CO 1	ACS009.04
	UNIT-II	·		L
	ADVANCED BEHAVIORAL MODELLIN	G		
-	Part – A (Short Answer Questions)	-		
1	Write a short note on classifiers?	Remember	CO 2	ACS009.05
2	Discuss different types of classifiers to help you to model.	Understand	CO 2	ACS009.05
3	What is Visibility? Discuss its importance in classes.	Remember	CO 2	ACS009.05
4	Describe four defined properties that can be used in operations.	Remember	CO 2	ACS009.05
5	What are Template classes?	Understand	CO 2	ACS009.05
6	Discuss UML defines four standard stereotypes that apply to classes.	Remember	CO 2	ACS009.05
7	Illustrate the advanced Dependency relationship.	Remember	CO 2	ACS009.05
8	Explain Generalization concept with suitable example.	Remember	CO 2	ACS009.05
9	What is Association? Discuss its importance.	Understand	$\frac{002}{002}$	ACS009.05
10	Write a short note on interface.	Understand	$\frac{\text{CO 2}}{\text{CO 2}}$	ACS009.06
11	What is Package? Discuss its terms and concepts.	Remember	$\frac{\text{CO 2}}{\text{CO 2}}$	ACS009.06
12	Discuss the use of importing and exporting in Package.	Understand	$\frac{\text{CO 2}}{\text{CO 2}}$	ACS009.06
13	Illustrate how the generalization among the packages will be happened	Understand	CO_2	ACS009.06
14	Explain UML defines five standard stereotypes that apply to packages	Remember	CO_2	ACS009.06
15	Discuss the common properties of Object diagram	Remember	CO_2	AC\$009.06
15	Explain the common modeling technique of Object diagram	Remember	CO_2	AC\$009.06
17	Discuss the uses of Use cases	Understand	CO_2	ACS009.00
17	What Use case diagrams commonly contains?	Understand	CO_2	ACS009.08
10	Describe the common modeling techniques of Use cases	Remember	CO_2	ACS009.08
20	Explain the common uses of Interaction diagrams	Understand	CO_2	ACS009.08
20	What Interaction diagrams commonly contains?	Understand	$\frac{\text{CO }2}{\text{CO }2}$	ACS009.07
21	What Activity diagrams commonly contains?	Dilucistallu	$\frac{\text{CO }2}{\text{CO }2}$	ACS009.07
22	Write a short note on Transition in Activity diagram	Remember	$\frac{\text{CO }2}{\text{CO }2}$	ACS009.07
23	Discuss about branching forking and Joing	Understand	$\frac{\text{CO }2}{\text{CO }2}$	ACS009.07
24	Discuss about branching, lorking and Joing.	Understand	CO 2	ACS009.07
23	Discuss the common moderning techniques used in Activity diagram.	Understand	002	AC3009.07
1	Furlain briefly terms and apparts and approximate and approxim	Understand	<u> </u>	AC5000.05
1	Advanced Classes	Understand	02	AC3009.03
2	Discuss the use of Advanced relationships Explain its common modeling	Understand	CO_2	ACS009.05
2	techniques with suitable examples.	Chiefstanie	002	11000000000
3	Explain in detail about Interfaces, Types and Roles with suitable examples	Remember	CO 2	ACS009.06
4	What are the uses of Packages? Discuss its common modeling techniques	Remember	CO 2	ACS009.06
5	Discuss the common modeling techniques of Class diagram.	Remember	CO 2	ACS009.06
6	Define the common modeling techniques of Object diagram.	Remember	CO 2	ACS009.06
7	What are Interactions? Explain its terms and concepts and common modeling	Understand	CO 2	ACS009.07
	techniques.			
8	Discuss in detail about Interaction diagrams with neat sketch.	Remember	CO 2	ACS009.07
9	What are Use cases? Explain its terms and concepts and common modeling	Understand	CO 2	ACS009.08
	techniques.			
10	Discuss in detail about Use case diagrams with neat sketch.	Understand	CO 2	ACS009.08
	Part - C (Problem Solving and Critical Thinking Q	uestions)		
1	Draw Object diagram that contains a three-level Hierarchy of objects.	Understand	CO 2	ACS009.06
2	How to model Static and Dynamic types of a system.	Understand	CO 2	ACS009.06
3	Enumerate the steps to model webs of relationships.	Remember	CO 2	ACS009.06
4	Describe the steps to model a group of elements by using Packages.	Remember	CO 2	ACS009.06
5	Explain about Links, Messages and Sequencing in Interactions.	Understand	CO 2	ACS009.07
6	Describe the steps to model a behavior of system in Use cases.	Understand	CO 2	ACS009.08
7	Design a Use case diagram for Cellular Phone.	Understand	CO 2	ACS009.08
8	Draw and explain Use case diagram for credit card validation system.	Remember	CO 2	ACS009.08
9	Draw and explain Sequence diagram for ATM system.	Remember	CO 2	ACS009.07
10	Design a Sequence diagram that specifies the flow of control involved in	Understand	CO 2	ACS009.07
	Initiating a simple, two-party phone call.			
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UNIT -III						
ARCHITECTURAL MODELLING						
1	Part - A (Short Answer Questions)	D 1	00.0	4 00000 00		
1	Define call Events.	Remember	<u>CO 3</u>	ACS009.09		
2	Write a short note on time and shance sucht	Damamhan	<u>CO 3</u>	ACS009.09		
3	Write a short note on time and change event.	Understand	<u>CO 3</u>	ACS009.09		
4	Define sending/receiving events	Understand	$\frac{003}{002}$	ACS009.09		
5	Denne sending/receiving events.	Diderstand	$\frac{003}{002}$	ACS009.09		
7	Discuss any three parts of transitions	Understand	$\frac{003}{003}$	ACS009.09		
/	What is guard condition?	Remember	$\frac{003}{003}$	ACS009.11		
0	Define state Machine	Understand	CO 3	ACS009.11		
10	Write about transitions and transition elements	Remember	CO 3	ACS009.11		
11	Define Node	Understand	$\frac{003}{003}$	ACS009.10		
12	Define process and threads.	Understand	CO 3	ACS009.10		
13	Write a short note on Time and Location.	Remember	CO 3	ACS009.10		
14	Define time and space.	Understand	CO 3	ACS009.10		
			001			
15	What is the common use of state chart diagram?	Remember	CO 3	ACS009.11		
16	Define the common properties of state chart diagram.	Understand	CO 3	ACS009.11		
17	How to model a reactive objects by using state chart diagram.	Remember	CO 3	ACS009.11		
18	Write a short note on forward and reverse engineering	Understand	CO 3	ACS009.12		
19	Discuss the common properties of component Diagram.	Remember	CO 3	ACS009.12		
20	What are the common uses of component diagram?	Understand	CO 3	ACS009.12		
21	Derive the steps to model a source code and executable release.	Remember	CO 3	ACS009.12		
22	Write a short note on deployment diagram.	Understand	CO 3	ACS009.12		
23	Discuss the common properties of deployment diagram.	Understand	CO 3	ACS009.12		
24	List out the steps to model an embedded system by using deployment diagrams.	Remember	CO 3	ACS009.12		
	Part – B (Long Answer Questions)					
1	Explain Signals, Call Events, Time Events, Change Events and Sending/ Receiving Events.	Understand	CO 3	ACS009.09		
2	Explain modeling a family of signals and modeling exceptions.	Remember	CO 3	ACS009.09		
3	Define State Machines. Explain States, Initial and Final states.	Remember	CO 3	ACS009.11		
4	Explain transitions and advanced states and transitions.	Understand	CO 3	ACS009.11		
5	Explain Modeling the lifetime of an object.	Understand	CO 3	ACS009.11		
6	Define process and threads. Explain flow of control, classes and events.	Remember	CO 3	ACS009.10		
7	Explain standard elements, communication and Synchronization.	Understand	CO 3	ACS009.10		
8	Describe the common modeling techniques of process and threads.	Understand	CO 3	ACS009.10		
9	Explain the terms and concepts of time and space with suitable examples.	Remember	CO 3	ACS009.10		
10	Explain the steps to model timing constraints and distribution of objects.	Understand	CO 3	ACS009.10		
11	Discuss in detail about state chart diagram. And also explain its contents and	Remember	CO 3	ACS009.11		
12	Explain the common modeling techniques of state chart diagram.	Understand	CO 3	ACS009.11		
13	Define Components. Explain its terms and concepts with suitable examples.	Remember	$\frac{003}{003}$	ACS009.12		
14	Explain different kinds of components with suitable examples.	Understand	$\frac{003}{003}$	ACS009.12		
15	Discuss the common modeling techniques are used in component diagrams with	Understand	CO 3	ACS009.12		
16	suitable examples.	Remember	<u> </u>	ACS009.12		
10	Common Uses.			AC0007.12		
17	Explain modeling source code and modeling an executable release.	Understand	<u>CO 3</u>	ACS009.12		
18 19	Explain the steps to model a physical database and modeling adaptable systems. Define Deployment diagrams. Explain its common modeling techniques with	Remember	CO 3 CO 3	ACS009.12 ACS009.12		
	neat sketch.	D 1	000	A C2000 10		
20	Discuss in detail about terms and concepts of deployment diagrams.	Kemember	CO 3	ACS009.12		
	Part – C (Problem Solving and Critical Thinking)					
1	Explain about state machines with suitable examples.	Understand	CO 3	ACS009.11		
2	What is time and space? Discuss in detail about time and space with suitable	Understand	CO 3	ACS009.10		

	examples			
3	What are process and threads? Explain in detail	Remember	CO 3	ACS009.10
4	Design a state Machine for the controller of a home security system which is	Understand	CO 3	ACS009.11
	responsible for monitoring various sensors around the perimeter of the house	Chiefstand	005	110000000111
	responsible for momenting various sensors around the permitter of the notice.			
05	Design a state chart diagram for the ATM system.	Understand	CO 3	ACS009.11
06	Design a state chart diagram for the Library Management System	Remember	CO 3	ACS009.11
07	Design a state chart diagram for the online railway reservation system	Remember	CO 3	ACS009.11
08	Draw a component diagram for ATM system	Remember	<u> </u>	ACS009.12
09	With neat sketch design a component diagram of airport check-in and boarding	Understand	CO 3	ACS009.12
07	of passengers.	Chacistana	005	
	UNIT-IV			
	DESIGN PATTERNS			
	Part – A (Short Answer Ouestions)			
1	How to choose the initial domain object?	Understand	CO 4	ACS009.13
2	Define the uses of patterns.	Understand	CO 4	ACS009.13
3	What do you mean by design patterns?	Remember	CO 4	ACS009.13
4	Define the term GRASP.	Understand	CO 4	ACS009.13
5	Write short notes on information expert.	Remember	CO 4	ACS009.13
6	Discuss about creator pattern.	Understand	CO 4	ACS009.13
7	Explain the basic objective of low coupling.	Understand	CO 4	ACS009.14
8	Define High cohesion in terms on design pattern.	Understand	CO 4	ACS009.14
9	List out some scenarios that illustrate varying degrees of functional cohesion.	Remember	CO 4	ACS009.14
10	What are the advantages of Factory objects?	Understand	CO 4	ACS009.14
11	What do you mean by cohesion? Give the types of cohesion.	Understand	CO 4	ACS009.15
12	Discuss the three basic types of attributes?	Remember	CO 4	ACS009.15
13	When should we use the design patterns?	Remember	CO 4	ACS009.15
14	Give the three UI design rules.	Understand	CO 4	ACS009.16
15	What is the use of factory method?	Remember	CO 4	ACS009.16
16	Write short notes on adapter pattern.	Understand	CO 4	ACS009.16
17	Discuss about behavioral pattern.	Remember	CO 4	ACS009.16
	Part – B (Long Answer Ouestions)			
1	Compare the differences between High cohesion and Low coupling with	Understand	CO 4	ACS009.13
	suitable examples.			
2	Discuss the process of assigning responsibilities to the object.	Remember	CO 4	ACS009.13
3	State the role and patterns while developing system design.	Understand	CO 4	ACS009.14
4	Compare the differences between Bridge and Adapter.	Remember	CO 4	ACS009.14
5	How will you design the behavioral pattern?	Remember	CO 4	ACS009.14
6	What is GRASP? Explain the following GRASP patterns: Creator, Information	Understand	CO 4	ACS009.13
ļ	Expert, Low coupling, and High Cohesion.			
7	Explain in detail about creational patterns.	Remember	CO 4	ACS009.15
8	Explain about factory and observer patterns.	Understand	CO 4	ACS009.16
9	Discuss in detail about advantages of design pattern.	Remember	CO 4	ACS009.15
10	Explain briefly about structural, behavioral pattern with suitable examples	Understand	CO 4	ACS009.16
	Part – C (Problem Solving and Critical Think	ing)		1 0 0 0 0 1 0
1	List out some scenarios that illustrate varying degrees of functional cohesion.	Remember	CO 4	ACS009.13
2	Explain GRASP: Patterns of general principles in assigning responsibilities.	Understand	CO 4	ACS009.13
3	Discuss in detail about creator and information expert with suitable example.	Understand	CO 4	ACS009.14
4	what is low coupling / Explain with suitable example.	Understand	CO 4	ACS009.13
5	Explain about Patterns for assigning responsibilities.	Understand	CO 4	ACS009.14
	APPLYING DESIGN PATTERNS			
1	Part - A (Snort Answer Questions) What is meant by System Sequence Diagrams?	Remember	CO 5	AC\$000.17
2	Define System Events and the System Boundary	Understand	CO 5	AC\$009.17
2	What is meant by System Babayier?	Understand	CO 5	ACS009.17
<u> </u>	What is meant by Inter-System SSDs?	Remember	CO 5	Δ (\$009.17
4	How to Name System Events and Operations?	Understand	CO 5	ΔCS009.17
5	What is meant by interaction diagram?	Remember	CO 5	ΔCS009.17

7	List the relationships used in class diagram?	Remember	CO 5	ACS009.18			
8	What is Inception?	Understand	CO 5	ACS009.18			
9	What Artifacts May Start in Inception?	Understand	CO 5	ACS009.18			
10	Define Requirements and mention its types.	Remember	CO 5	ACS009.18			
11	What are Actors?	Remember	CO 5	ACS009.19			
12	What is a scenario?	Remember	CO 5	ACS009.19			
13	Define Use case.	Understand	CO 5	ACS009.19			
14	What are Three Kinds of Actors?	Remember	CO 5	ACS009.19			
15	What are Use Case Diagrams?	Understand	CO 5	ACS009.19			
16	What is a Domain Model?	Understand	CO 5	ACS009.20			
17	How the domain model is illustrated?	Remember	CO 5	ACS009.20			
18	What are the elements not suitable in a domain model?	Remember	CO 5	ACS009.20			
19	How to Create a Domain Model?	Understand	CO 5	ACS009.20			
20	Draw a Use case diagram for payment for the product by using include	Remember	CO 5	ACS009.20			
	relationship.						
	Part - B (Long Answer Questions)						
1	Explain system sequence diagram with an example.	Understand	CO 5	ACS009.17			
2	Explain logical architecture and UML package diagram.	Remember	CO 5	ACS009.18			
3	Discuss in detail about NextGen POS system.	Remember	CO 5	ACS009.20			
4	Write about inception and its uses.	Understand	CO 5	ACS009.20			
5	What are UML package diagrams? Discuss in detail about suitable examples.	Remember	CO 5	ACS009.19			
6	What are the concepts involved in domain refinement?	Understand	CO 5	ACS009.19			
7	Explain in detail about logical architecture refinement.	Remember	CO 5	ACS009.19			
8	Explain with the example, how interaction diagram are used to model the	Remember	CO 5	ACS009.20			
	dynamic aspects of the system.						
9	Explain different steps involved in inception.	Understand	CO 5	ACS009.20			
10	Define the use of extend and generalization with suitable examples.	Remember	CO 5	ACS009.20			
	Part – C (Problem Solving and Critical Thinking)						
1	Explain with an example, how use case modeling is used to describe functional	Understand	CO 5	ACS009.18			
2	Requirements.	D	CO 5	A C0000 10			
2	Discuss in detail about Relating Use cases with suitable examples.	Remember		ACS009.19			
3	what is the use of domain model? Explain with suitable example.	Kemember	005	ACS009.18			
4	Draw the partial implementation of ATM system by using domain model.	Understand	CO 5	ACS009.18			
5	Discuss in detail about different types of Actors involved in Use cases.	Remember	CO 5	ACS009.17			

Prepared by: Mr. N Bhaswanth, Assistant Professor

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