OR	iii.	How does reusability contribute to efficient software development? Explain its impact on reducing development time and cost.	**5**	4	03 04	1
Q.3	i.	Describe design patterns in UML modelling.	**2**	1	03 04	2
	ii.	Write technological description of distributed systems with example	**8**	1	03 04	2
OR	iii.	Draw and explain each element of use case diagram of banking system	**8**	3	03 04	2
Q.4	i.	Classify various UML methods.	**3**	2	03 04	3
	ii.	Discuss the significance of sequence diagrams in understanding system behavior and communication with example.	**7**	4	03 04	3
OR	iii.	Describe the primary elements of a collaboration. Also draw collaboration diagram for ecommerce website.	**7**	5	03 04	3
Q.5	i.	Differentiate White box and Black box.	**4**	2	03 04	4
	ii.	Implement an activity diagram for ATM machine with explanation.	**6**	4	03 04	4
OR	iii.	How can you use state diagrams to model a system's behaviour? Explain with an example.	**6**	4	03 04	4
Q.6		Attempt any two:				
	i.	Explain component diagram in detail with a suitable example.	**5**	1	03 04	5
	ii.	Discuss deployment diagram in detail with suitable example.	**5**	1	03 04	5
	iii.	How to design a database in UML environment?	**5**	5	03 04	5

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Total No. of Questions: 6 *Total No. of Printed Pages:4*

Enrollment No.....

Faculty of Engineering
End Sem Examination Dec 2024
CB3CO25 Software Design with UML

Programme: B.Tech. Branch/Specialisation: CSBS

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

			Marks	BL	PO	CO	PSO
Q.1	i.	What does the term "software crisis" primarily refer to? (a) Hardware malfunction (b) Challenges in developing and maintaining software (c) Issues with network security (d) Problems with data storage	**1**	1	03 04	1	
	ii.	The Waterfall Model is best suited for- (a) Projects with frequently changing requirements (b) Small, experimental projects (c) Large projects with well-defined requirements (d) Rapid application development projects	**1**	1	03 04	1	
	iii.	Which of the following patterns allows for adding behaviour to an individual object dynamically without affecting the behaviour of other objects from the same class? (a) Adapter (b) Decorator (c) Flyweight (d) Memento	**1**	1	03 04	2	

iv.	Which of the following statements about use case modelling is TRUE? (a) It focuses on the internal structure of the system (b) It only involves technical team members (c) It helps identify functional requirements by modelling user interactions (d) It documents non-functional requirements exclusively	**1**	1	03 04	2	
v.	In UML, what is the difference between an operation and a method? (a) An operation specifies behaviour, while a method is the implementation of that behaviour (b) A method is a class attribute, while an operation is an instance attribute (c) There is no difference; both terms are interchangeable in UML (d) An operation is used in interfaces, while a method is used in classes only	**1**	1	03 04	3	
vi.	Which of the following is TRUE about collaboration diagrams? (a) They emphasize the order of messages over relationships (b) They focus on the relationships and interactions between objects (c) They are used exclusively for modelling database interactions (d) They represent the inheritance hierarchy of a system	**1**	1	03 04	3	
vii.	When should you choose a collaboration diagram over a sequence diagram? (a) When you want to emphasize object interactions and relationships rather than the specific order of messages (b) When you need to show the chronological order of events	**1**	2	03 04	4	

	(c) When the diagram involves a single class only (d) When focusing on static relationships among classes					
viii.	In event handling, an event is best described as- (a) A function that is always running in the background (b) An occurrence or action, often triggered by the user, that the program detects and responds to (c) A data structure used for storing object states (d) A message passed between two functions	**1**	1	03 04	4	
ix.	When should you use a component diagram in software design? (a) When you want to model the physical layout of software components and their dependencies (b) When you need to represent the flow of data between different objects (c) When you are focusing on the inheritance and relationships between classes (d) When illustrating the timing of events in a system	**1**	1	03 04	5	
x.	In deployment diagrams, threads are essential for illustrating- (a) The interaction between physical devices (b) The concurrency and parallelism within applications deployed on nodes (c) The flow of data between two classes (d) The inheritance relationships among classes	**1**	1	03 04	5	
Q.2 i.	Differentiate waterfall model and spiral model.	**2**	3	03 04	1	
ii.	Explain the significance of the Software Development Life Cycle (SDLC) in the software development process.	**3**	3	03 04	1	
iii.	Differentiate object-oriented analysis and structure analysis.	**5**	4	03 04	1	

Marking Scheme

CB3CO25 Software Design with UML

Q.1	i)	B. Challenges in developing and maintaining software	**1**
	ii)	C. Large projects with well-defined requirements	**1**
	iii)	B. Decorator	**1**
	iv)	C. It helps identify functional requirements by modelling user interactions	**1**
	v)	A. An operation specifies behaviour, while a method is the implementation of that behaviour	**1**
	vi)	B. They focus on the relationships and interactions between objects	**1**
	vii)	A. When you want to emphasize object interactions and relationships rather than the specific order of messages	**1**
	viii)	B. An occurrence or action, often triggered by the user, that the program detects and responds to	**1**
	ix)	A. When you want to model the physical layout of software components and their dependencies	**1**
	x)	B. The concurrency and parallelism within applications deployed on nodes	**1**
Q.2	i.	Differentiate Waterfall Model and Spiral Model. 4 differences - 0.5 marks each	**2**
	ii.	Explain the significance of the Software Development Life Cycle (SDLC) in the software development process. Diagram -1 marks Explanation -2 marks	**3**
	iii.	Differentiate object-oriented analysis and structure analysis. 5 Differences - 1 marks each	**5**
OR	iv.	How does reusability contribute to efficient software development? Explain its impact on reducing development time and cost. Part 1 Explanation : 2.5 marks Part 2 Explanation : 2.5 marks	**5**
Q.3	i.	Describe design patterns in UML modelling. Explanation- 2 marks	**2**
	ii.	Write Technological Description of Distributed Systems with example.	**8**
		Block Diagram : 3 Explanation : 5	
OR	iii.	Draw and explain each element of use case diagram of Banking System. Elements of use case : 3 marks Diagram : 5 marks	**8**
Q.4	i.	Classify various UML methods. 3 Types - 1 marks each	**3**
	ii.	Discuss the significance of sequence diagrams in understanding system behavior and communication with example. Explanation : 4 marks Diagram : 3 marks	**7**
OR	iii.	Describe the primary elements of a Collaboration Also Draw Collaboration diagram for Ecommerce website. Explanation : 4 marks Diagram : 3 marks	**7**
Q.5	i.	Differentiate White box and Black box. 4 Difference : 1 marks each	**4**
	ii.	Diagram : 3 marks Explanation: 3marks	**6**
OR	iii.	Explanation : 3 marks Diagram : 3 marks	**6**
Q.6		Attempt any two:	
	i.	Explain component diagram in detail with a suitable example. Diagram : 2 marks Explanation : 3 marks	**5**
	ii.	Discuss deployment diagram in detail with suitable example. Diagram : 2 marks Explanation : 3 marks	**5**
	iii.	How to design a database in UML environment. Explanation : 5 marks	**5**

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P.T.O.