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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

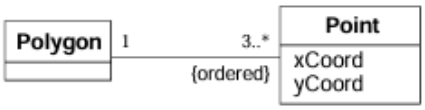
January / February 2025 Semester End Main Examinations

Programme: B.E. **Semester: VI**
Branch: Computer Science and Engineering **Duration: 3 hrs.**
Course Code: 22CS6PCSEO **Max Marks: 100**
Course: Software Engineering and Object Oriented Modeling

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

		UNIT - I	CO	PO	Marks
1	a)	List and explain the attributes of good software.	CO1	PO1	6
	b)	Differentiate between Functional and non-functional requirements and list the functional and non-functional requirements for website application.	CO 2	PO2	8
	c)	Identify which model is most suitable in situations where the project requirements are well-defined and the project goals are clear. It is often used for large-scale projects with long timelines, where there is little room for error and the project stakeholders need to have a high level of confidence in the outcome. Explain the same with a neat diagram with its drawbacks.	CO 2	PO 2	6
		OR			
2	a)	Giving reasons for your answers based on the type of system being developed, suggest the most appropriate generic software process model that might be used as a basis for managing the development of the following systems: i)An interactive system that allows flight passengers to find flight times from terminals installed in airports. ii) A banking accounting system that replaces an existing system. iii)A system to control anti-lock braking in a bike.	CO 2	PO2	6
	b)	Discuss the responsibilities that the software engineers should have towards professional and society. State ACM/IEEE principles that software engineers should adhere to the code of Ethics and professional practice.	CO 2	PO2	8
	c)	Illustrate the structure of software requirement document.	CO1	PO1	6
		UNIT - II			
3	a)	List and explain the process activities involved in Requirements Engineering.	CO 1	PO 1	6
	b)	Consider a University Management System, identify the stakeholders and write the viewpoint hierarchy for the same.	CO 2	PO 2	8

		c)	Design the context model for Inventory management System.	*CO 3*	*PO 3*	**6**
			OR			
	4	a)	List the questions to be considered when choosing Architectural design.	*CO 1*	*PO 1*	**6**
		b)	Design the State chart diagram for Microwave oven that has various operations for cooking.	*CO 3*	*PO 3*	**8**
		c)	Differentiate between enduring requirements and volatile requirements. Give examples for each with respect to Hospital management.	*CO 2*	*PO 2*	**6**
			UNIT - III			
	5	a)	Explain the concept of Ordering, Bags and Sequences of Class model with an example for each.	*CO 1*	*PO 1*	**6**
		b)	Using the below class diagram, prepare an object diagram for two triangles with a common side under the following conditions. 1. A point belongs to exactly one polygon. 2. A point belongs to one or more polygons. 	*CO 3*	*PO 3*	**8**
		c)	Analyze the following relationships into generalization, aggregation, association and n-ary associations. Explain your answers. i) A drawing object is text, a geometrical object, or a group. ii) A person uses a computer language on a project. iii) Modems and keyboards are input/output devices. iv) A route connects two cities. v) A file contains records.	*CO 2*	*PO 2*	**6**
			OR			
	6	a)	Analyze and identify a list of classes that you would expect each of the following system to handle: i) A catalog store order enter system. ii) A Speed fast courier system. iii) A ticketing system in metro rail service. iv) A voice mail system with delivery options, message forwarding and group lists.	*CO 2*	*PO 2*	**6**
		b)	A library lends books and magazines to members, who are registered in the system. Also it handles the purchase of new titles for the library. Popular titles are bought in multiple copies. Old books and magazines are removed when they are out of date or in poor condition. 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, the person is notified. The library can easily create, replace and delete information about the titles, members loans and reservations in the system. Create a Class Diagram for the above problem definition. Give the explanation for your design.	*CO 3*	*PO 3*	**8**
		c)	Differentiate with an example for each.	*CO 2*	*PO 2*	**6**

			1. Aggregation and Association 2. Aggregation and Composition			
			UNIT - IV			
	7	a)	Discuss the two types of state diagrams with an example for each.	***CO 1***	***PO 1***	**6**
		b)	Design a Sequence diagram for e-commerce application for the below functionalities: i)Login functionality ii) Add to cart functionality iii)Product order functionality iv) Customer care functionality	***CO 3***	***PO 3***	**8**
		c)	Consider a software system for supporting checkout of materials at a public library. 1. List four actors. Explain the relevance of each actor. 2. One use case is to borrow a library item. List three additional use cases at a comparable level of abstraction. Summarize the purpose of each use case with a sentence. 3. Prepare a use case diagram for a library checkout system.	***CO 3***	***PO 3***	**6**
			OR			
	8	a)	Explain Procedural Sequence models with suitable examples.	***CO 1***	***PO 1***	**6**
		b)	Design a state diagram for the following scenario a) ATM is initially turned off. After the power is turned on, ATM performs startup action and enters Self Test state. If the test fails, ATM goes into Out of Service state, otherwise there is triggerless transition to the Idle state. In this state ATM waits for customer interaction. The ATM state changes from Idle to Serving Customer when the customer inserts banking or credit card in the ATMs card reader. On entering the Serving Customer state, the entry action read Card is performed. Note, that transition from Serving Customer state back to the Idle state could be triggered by cancel event as the customer could cancel transaction at any time. Serving Customer state is a composite state with sequential substates Customer Authentication, Selecting Transaction and Transaction. Customer authentication and Transaction are composite states by themselves which is shown with hidden decomposition indicator icon. Serving Customer state has triggerless transition back to the Idle state after transaction is finished. The state also has exit action eject Card which releases customer's card on leaving the state, no matter what caused the transition out of the state.	***CO 3***	***PO 3***	**8**
		c)	A company is manufacturing a new product and must coordinate several departments. The product starts out as a raw marketing idea that goes to engineering. Engineering simulates the function of the product and prepares a design. Manufacturing reviews the design and adjusts it to conform to existing machinery. Engineering approves the revisions and customer service then looks at the design—a good design must enable ready repair. Engineering approves the customer service proposals and ensures	***CO 3***	***PO 3***	**6**

			that the resulting design still meets the target functionality. Construct an activity diagram for this process. Use swim lanes to show the various interactions. Show the changes in the state of the design as the activity diagram proceeds.			
			UNIT - V			
	9	a)	List and explain the Principles of agile methods with its drawbacks.	***CO 1***	***PO 1***	**6**
		b)	Consider a testing approach which involves building a system from its components and testing it for problems that arise from component interactions. Discuss the approaches the above testing method follows and identify which approach is followed to achieve error localization. Explain the process with a neat diagram.	***CO 2***	***PO 2***	**8**
		c)	Analyze and explain the strategies that helps to manage risks.	***CO 2***	***PO 2***	**6**
			OR			
	10	a)	Differentiate between System testing and Component testing	***CO 1***	***PO 1***	**6**
		b)	What types of risks are likely to encounter as software is built and as the technical leader how do you assess the overall risk associated with the software.	***CO 2***	***PO 2***	**8**
		c)	As a project manager of a company what are the basic principles you adopt when you develop a complete schedule for the project.	***CO 1***	***PO 1***	**6**

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