U.S.N.										

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

Autonomous Institute Affiliated to VTU

June 2025 Semester End Main Examinations

Programme: B.E. **Semester: IV**

Branch: Computer Science and Engineering **Duration: 3 hrs.**

Course Code: 23CS4PCSED **Max Marks: 100**

Course: Software Engineering

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)	Consider an interactive system(kiosk) set up at different places in the ground floor of a mall that allows users to check the details of various shops located in each floor, the offers and discount available as well as the information of common facilitates available like lifts, lobby, etc, identify the Non-functional requirements required for such a system and explain using hierarchy diagram.	*CO2*	*PO2*	**6**
	b)	Design a Software requirements document for a Mobile Shop that is into Sales and Service of mobiles, the mobile shop provides various facilities for customers like EMI options for purchase of new mobile and exchange of old mobiles.	*CO2*	*PO2*	**6**
	c)	(i) As a programmer you are offered a promotion to project manager but you feel that you can make a more effective contribution still. Discuss the ethical dilemmas that this request raises and also list the professional and ethical responsibilities of a software engineer. (ii) State Code of Ethics and Professional Practice as specified by ACM/IEEE-CS joint task force.	*CO2*	*PO8*	**8**
		OR			
2	a)	Design a template using structured natural language to capture the requirements for a weather Monitoring System that collects weather data from a weather station and predicts the weather forecasts.	*CO3*	*PO3*	**6**
	b)	Giving reasons for your answer 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) Campus web portal of a college	*CO2*	*PO2*	**6**

			(ii) An Air-traffic control system at airport Explain each of the model with relevant diagrams			
		c)	i) Suggest the guidelines to be followed when writing user requirements in order to minimize misunderstandings ii) Illustrate the four important attributes which all software products should have. Identify and Suggest four other attributes that may sometimes be significant for an Intruder Alarm system that is set-up at home.	*CO2*	*PO2*	**8**
			UNIT - II			
	3	a)	Analyze the Library Management System that catalogues copyrighted articles from various countries and Identify the principal viewpoints which might be considered and organize these using a view point hierarchy diagram.	*CO2*	*PO2*	**6**
		b)	Consider an Online Food ordering System. • List the actors involved and prepare the use case diagram for the system. • Prepare the sequence diagram for ordering food and online payment	*CO3*	*PO3*	**6**
		c)	Assume you are responsible for writing the specification for a software system that controls a network of EPOS (electronic point of sale) terminals in a store. The system accepts bar code information from a terminal, queries a product database and returns the item name and its price to the terminal for display. The system must be continually available during the store's opening hours. Draw Context model and Dataflow model for the above specified system and explain.	*CO3*	*PO3*	**8**
			OR			
	4	a)	Differentiate between Enduring and Volatile requirements. Identify enduring and volatile requirements for Hospital management system	*CO2*	*PO2*	**6**
		b)	Draw object aggregate diagram for a study pack for a university course. This study pack includes lecture notes, exercises, sample solutions, copies of transparencies used in lectures and videotapes.	*CO3*	*PO3*	**6**
		c)	Draw state machine model for an automatic washing machine that has different programs for different types of clothes and explain.	*CO3*	*PO3*	**8**
			UNIT - III			
	5	a)	Using the UML graphical notation for object classes, Identify the objects and design object Generalization diagram showing interactions of objects for the following: A group diary and time management system is intended to support the timetabling of meetings and appointments across a group of coworkers. When an appointment is to be made that involves a number of people, the system finds a common slot in each of their	*CO2*	*PO2*	**6**

			diaries and arranges the appointment for that time. If no common slots are available it interacts with the user to rearrange his or her personal diary to make room for the appointment.			
		b)	Differentiate between the two strategies used for decomposing a Sub-system to modules	*CO2*	*PO2*	**6**
		c)	(i)Analyze why design conflicts might arise when designing an architecture where availability and security requirements are the most important functional requirements. Justify your answer. (ii)Design an appropriate structural model for a configuration management system that manages versions of objects and provides general configuration management and explain	*CO3*	*PO3*	**8**
			OR			
	6	a)	Analyze the various proposals that help in identifying objects	*CO2*	*PO2*	**6**
		b)	Using the UML graphical notation for object classes, design Sequence diagram for a petrol or gas station to be set up for fully automated operation.	*CO3*	*PO3*	**6**
		c)	(i)Giving reasons for your answer based on the type of system being developed, suggest the most appropriate structural model (How a system is decomposed into sub-systems) that might be used as a basis for managing the development of the following systems: 1) A University Automated Marks card Generation system 2) An automated robot floor cleaner Explain with neat diagram (ii) Giving reasons for your answer suggest an appropriate control model for the following with a neat diagram: 1) A system that monitors sugar level in patients and dispenses insulin 2) A system to control a Television unit Explain with neat diagram	*CO3*	*PO3*	**8**
			UNIT - IV			
	7	a)	Describe the basic principles that guide software project scheduling	*CO1*	*PO1*	**6**
		b)	Analyze and explain the organizational paradigms as suggested by Constantine for defining the structure of a software team.	*CO2*	*PO2*	**6**
		c)	If an organizations productivity is 12 FP/pm based on a burdened labor rate of $20000 per month. The Count total 450 and Σ (fi) is 58. Calculate: (i) Cost per FP (ii) Estimated effort in person-months (iii) Estimated project cost	*CO1*	*PO1*	**8**

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<tr><td></td><td></td><td></td><td>OR</td><td></td><td></td><td></td></tr>
<tr><td></td><td>8</td><td>a)</td><td>Describe the risk mitigation, monitoring and management plan as a part of software project plan considering an example.</td><td>CO1</td><td>PO1</td><td>6</td></tr>
<tr><td></td><td></td><td>b)</td><td>An organizations average productivity is 1250 LOC/pm. The average labor rate is $12250 per month. Calculate
(i) Cost per line of Code
(ii) Overall Project cost if the proposed project has 276000LOC
(iii) Estimated effort in person-months</td><td>CO1</td><td>PO1</td><td>6</td></tr>
<tr><td></td><td></td><td>c)</td><td>Design a Task Network and Time line chart for the given tasks and also show the critical path
<table><tr><th>Task</th><th>Duration</th><th>Dependencies</th></tr><tr><td>T1</td><td>15</td><td></td></tr><tr><td>T2</td><td>20</td><td>T1 (M1)</td></tr><tr><td>T3</td><td>5</td><td>T1,T2 (M2)</td></tr><tr><td>T4</td><td>15</td><td>T2 (M3)</td></tr><tr><td>T5</td><td>25</td><td>T2,T4(M4)</td></tr><tr><td>T6</td><td>16</td><td>T3(M6)</td></tr></table></td><td>CO3</td><td>PO3</td><td>8</td></tr>
<tr><td></td><td></td><td></td><td>UNIT - V</td><td></td><td></td><td></td></tr>
<tr><td></td><td>9</td><td>a)</td><td>Analyze the key strategies of clean-room approach to software development with relevant diagram.</td><td>CO2</td><td>PO2</td><td>10</td></tr>
<tr><td></td><td></td><td>b)</td><td>Differentiate between Whitebox and Blackbox testing with relevant example and diagram.</td><td>CO2</td><td>PO2</td><td>10</td></tr>
<tr><td></td><td></td><td></td><td>OR</td><td></td><td></td><td></td></tr>
<tr><td></td><td>10</td><td>a)</td><td>Justify that program inspections are an effective technique for discovering errors in a program. List the types of errors that are likely to be discovered through inspections.</td><td>CO2</td><td>PO2</td><td>10</td></tr>
<tr><td></td><td></td><td>b)</td><td>Describe path testing approach of test case design by drawing a flow graph for a binary search routine. Determine and write the different paths that are executed.</td><td>CO2</td><td>PO2</td><td>10</td></tr>
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