U.S.N.										

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

Autonomous Institute Affiliated to VTU

February 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)		Define Software Engineering. Illustrate the professional and ethical responsibilities that a Software Engineer should have.	CO2	PO2	06
	b)		As an expert in computer security, you have been approached by an organization that campaigns for the rights of torture victims and have been asked to help them gain unauthorized access to the computer systems of a British company. This will help them confirm or deny that this company is selling equipment used directly in the torture of political prisoners. Discuss the ethical dilemmas that this request raises and the professional and ethical responsibilities of software engineer that you would be violating. State Code of Ethics and Professional Practice as specified by ACM/IEEE-CS joint task force.	CO1	PO1	08
	c)		Illustrate the two fundamental types of evolutionary development. Identify the problems existing in evolutionary approach.	CO1	PO1	06
			OR			
2	a)		Describe the following (i) Attributes of good software system (ii) Key challenges faced by software engineering.	CO1	PO1	08
	b)		Design a template using structured natural language to capture the requirements of a system that monitors insulin level of patients in a hospital intensive care unit.	CO3	PO3	08
	c)		Differentiate between Software Engineering and System Engineering.	CO2	PO2	04
			UNIT II			
3	a)		Analyze the Library Management System that catalogues copyrighted articles from various countries. Identify the principal viewpoints which might be considered and organize these using a view point hierarchy diagram.	CO2	PO2	06
	b)		Draw a state transition diagram for micro-oven showing various operations for cooking.	CO3	PO3	08

		c)	Identify the categories of requirement based on evolution perspective and demonstrate the classification of requirements that are likely to change.	*CO2*	*PO2*	**06**
			OR			
	4	a)	Design a Data Flow Diagram (DFD) for an Online Shopping System that shows the flow of data through the various processes, such as product browsing, order placement, payment processing, and delivery.	*CO3*	*PO3*	**08**
		b)	Explore the techniques employed for validating requirements and illustrate how these techniques apply to different categories of requirements.	*CO2*	*PO2*	**06**
		c)	Examine a Healthcare Information Management System responsible for managing patient data across various hospitals internationally. What are the primary viewpoints that need to be considered, and how can they be organized into a viewpoint hierarchy diagram?	*CO2*	*PO2*	**06**
			UNIT - III			
	5	a)	(i) Suggest the most appropriate structural model that might be used as a basis for managing the development of the following systems and give reasons for your answer based on the type of system being developed: 1. Passport Authentication system 2. An automated robot floor cleaner Justify and explain with neat diagram. (ii) Suggest an appropriated control model for the following with a neat diagram and give reasons for your answer: 1. A television controller that responds to signals from a remote-control unit. 2. A batch processing system that takes information about hours worked and pay rates and prints salary slips and bank credit transfer information Justify and explain with neat diagram	*CO2*	*PO2*	**08**
		b)	Develop the design of the weather station to show the interaction between the data collection sub-system and the instruments that collect weather data. Use sequence charts to show this interaction.	*CO3*	*PO3*	**06**
		c)	Describe repository model with appropriate example. State the advantages and disadvantages of the repository model.	*CO2*	*PO2*	**06**
			OR			
	6	a)	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 the architectural model.	*CO3*	*PO3*	**06**
		b)	Giving reasons for your answer suggest an appropriated control model for the following with a neat diagram: 1) A system that monitors sugar level in patients and dispenses insulin	*CO2*	*PO2*	**08**

			2) A system to control a Television unit Explain with neat diagram			
		c)	Design an object aggregation model for a ticket reservation system, illustrating the relationships between entities like customers, bookings, tickets, payments, and events.	***CO3***	***PO3***	**06**
			UNIT - IV			
	7	a)	Define Macroscopic Scheduling. Draw time line for macroscopic project schedule for SafeHomeAssured.com webApp.	***CO1***	***PO1***	**08**
		b)	An organizations average productivity is 550 LOC/pm. The average labor rate is $9750 per month. Calculate (i) Cost per line of Code (i) Overall Project cost if the proposed project has 282000 LOC (iii) Estimated effort in person-months	***CO2***	***PO2***	**06**
		c)	Analyze the series of questions that lead to definition of key project characteristics and the resultant project plan as proposed by Barry Boehm.	***CO2***	***PO2***	**06**
			OR			
	8	a)	Describe the organizational paradigms suggested by Constantine for structuring a software development team.	***CO1***	***PO1***	**07**
		b)	Examine the different categories of risks in software projects and explain each with relevant examples.	***CO2***	***PO2***	**07**
		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: a. Cost per FP b. Estimated effort in person-months c. Estimated project cost	***CO2***	***PO2***	**06**
			UNIT - V			
	9	a)	Analyze the main strategies of formal approach to software development and explain with relevant diagram.	***CO2***	***PO2***	**06**
		b)	The management of an organization has asked you to carry out a system assessment on 30 legacy systems they have. The results of that assessment are to be used for deciding whether the system is obsolete and that it should be replaced by a new system. Show the assessment of each of these systems by plotting it on a chart relative to business value and system quality and explain.	***CO2***	***PO2***	**08**
		c)	Differentiate between Whitebox and Blackbox testing with relevant example and diagram.	***CO2***	***PO2***	**06**
			OR			
	10	a)	Analyze the principles of Agile methods based on incremental development and delivery	***CO2***	***PO2***	**06**
		b)	Demonstrate software testing workbench and the tools that might be included in such a testing workbench.	***CO2***	***PO2***	**06**
		c)	Illustrate the working of path testing with an example.	***CO1***	***PO1***	**08**

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