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

Autonomous Institute Affiliated to VTU

June 2025 Semester End Main Examinations

Programme: B.E. **Semester: VII**

Branch: Artificial Intelligence and machine Learning **Duration: 3 hrs.**

Course Code: 24AM7PEHCI **Max Marks: 100**

Course: Human Computer Interaction

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)	Illustrate the impact of Double Diamond design process in developing user-centered solutions.	*CO1*	*PO1*	**06**
	b)	How does Human-Computer Interaction (HCI) leverage knowledge from diverse fields, and why is this approach crucial?	*CO1*	*PO1*	**06**
	c)	Apply the principles of ergonomics and design an interface for bank Automatic Teller Machine (ATM) that enhance user comfort, productivity.	*CO2*	*PO3*	**08**
		OR			
2	a)	Describe the significant developments in the evolution of Human-Computer Interaction (HCI).	*CO1*	*PO1*	**06**
	b)	Describe the impact of gulf of evaluation and gulf of execution on user experience with the system.	*CO1*	*PO1*	**06**
	c)	Consider a smart home device (voice-activated assistant). Apply Norman's execution-evaluation cycle in identifying potential usability issues. Provide examples for each stage of the cycle where the interaction might fail.	*CO2*	*PO3*	**08**
		UNIT - II			
3	a)	Explain the key principles that impact the flexibility of a system interface.	*CO1*	*PO1*	**06**
	b)	Explain Norman’s Seven Principles for Transforming Difficult Tasks into Simple Ones.	*CO1*	*PO1*	**06**
	c)	Design a navigation strategy for an e-learning platform targeting university students, integrating both global and local navigation elements to enhance engagement and usability. Include specific examples of navigation components, course layouts, and user interaction flows.	*CO2*	*PO3*	**08**
		OR			

	4	a)	Explain the term "Design" in relation to goals, constraints, and the trade-offs that may arise between them, with suitable example.	*CO1*	*PO1*	**06**
		b)	Explain the significance of dividing the display area into sub-areas (input, output, operational indications) as suggested by German standard DIN 66 234. How does this aid in improving visual acquisition?	*CO1*	*PO1*	**06**
		c)	Provide specific examples for each rule of Shneiderman's eight golden rules of interface design, to improve the usability of mobile banking application.	*CO3*	*PO2*	**08**
			UNIT - III			
	5	a)	i. Design a set of production rules for a smart thermostat that adjusts the temperature based on user preferences and environmental conditions. ii. Describe how these rules can help the thermostat operate efficiently and provide a better user experience.	*CO2*	*PO3*	**10**
		b)	Create a GOMS description of the task "photocopying an article from a journal". Explain the issue of closure in terms of GOMS description.	*CO2*	*PO3*	**10**
			OR			
	6	a)	Using Task Action Grammar (TAG), represent the user actions required for sending an email in an email client. Include steps such as composing the email, attaching a file, and clicking "Send."	*CO2*	*PO3*	**10**
		b)	Apply Fitts' Law to analyse the efficiency of two designs for a toolbar in a text editor: one with large icons placed at the top of the screen and another with small icons placed at the side. Calculate and compare the pointing time for selecting an icon in both designs, considering different distances and sizes.	*CO2*	*PO3*	**10**
			UNIT - IV			
	7	a)	Describe the different types of collaboration, with their respective goals and tools. Provide example for each type of collaboration.	*CO1*	*PO1*	**10**
		b)	Explain guidelines for designing Synchronous distributed Interfaces.	*CO1*	*PO1*	**10**
			OR			
	8	a)	Describe with suitable example significance of Asynchronous distributed interfaces in collaboration.	*CO1*	*PO1*	**08**
		b)	Differentiate face-to-face interfaces with Synchronous distributed and Asynchronous distributed interfaces.	*CO1*	*PO1*	**08**
		c)	Explain the traditional way to decompose collaborative interfaces by time/space matrix.	*CO1*	*PO1*	**04**
			UNIT - V			
	9	a)	Design a hierarchical task analysis to make a cup of tea that includes cycles, waiting for events and optional task.	*CO2*	*PO3*	**10**

		b)	Differentiate between two distinct evaluation styles, those performed under laboratory conditions and those conducted in the work environment or 'in the field'.	*CO1*	*PO1*	**06**
		c)	Explain knowledge-based analysis with suitable example.	*CO1*	*PO1*	**04**
			OR			
	10	a)	Provide examples for each of the Nielsen's ten usability heuristics to design a mobile banking application that ensures an intuitive, efficient, and error-free experience for both first-time users and tech-savvy individuals.	*CO3*	*PO1*	**10**
		b)	List the factors that distinguish different evaluation techniques.	*CO1*	*PO1*	**06**
		c)	Explain the uses of task analysis.	*CO1*	*PO1*	**04**

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