U.S.N.										

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

Autonomous Institute Affiliated to VTU

April 2025 Semester End Make-Up Examinations

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

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

Course Code: 22CS7PEHCI **Max Marks: 100**

Course: Human Computer Interaction, Virtual & Augmented Reality

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 vision and discuss human eye and visual perception with a neat diagram.	*CO1*	*PO1*	**6**
	b)	Discuss different devices involved in position, pointing and drawing.	*CO1*	*PO1*	**6**
	c)	Discuss the type of memory and explain with an example the STM?	*CO1*	*PO1*	**8**
		OR			
2	a)	Explain the execution, evaluation cycle of interaction.	*CO1*	*PO1*	**6**
	b)	With a neat diagram explain the framework for human computer interactions.	*CO1*	*PO1*	**6**
	c)	Consider the following table and explain the differences between real and virtual crackers with interactions.	*CO1*	*PO1*	**8**

	Real cracker	**Virtual cracker**
Surface elements		
Design	Cheap and cheerful	Simple page/graphics
Play	Plastic toy and joke	Web toy and joke
Dressing Up	Paper hat	Mask to cut out
Experienced effects		
Shared	Offered to another	Sent by email, message
Co-experience	Pulled together	Sender can't see content until opened by recipient
Excitement	Cultural connotations	Recruited expectation
Hiddenness	Contents inside	First page – no contents
Suspense	Pulling cracker	Slow...page change
Surprise	Bang (when it works)	WAV file (when it works)

			UNIT - II			
	3	a)	Discuss GOMS model	*CO1*	*PO1*	**5**
		b)	Analyse the following code with GOMS model. GOAL: ICONIZE-WINDOW . [SELECT GOAL: USE-CLOSE-METHOD . . MOVE-MOUSE-TO-WINDOW-HEADER . . POP-UP-MENU . . CLICK-OVER-CLOSE-OPTION . GOAL: USE-L7-METHOD . . PRESS-L7-KEY1 The dots are used to indicate to indicate the hierarchical level of goals.	*CO1*	*PO1*	**5**
		c)	Create a GOMS description of the task of photocopying an article from a journal. Discuss the issues of closure in terms of your GOMS description.	*CO1*	*PO1*	**10**
			OR			
	4	a)	What is cognitive complexity theory? Explain this theory with CCT production rules.	*CO1*	*PO1*	**10**
		b)	Discuss the pros and cons of the following i. BNF ii. Task-Action Grammar	*CO1*	*PO1*	**10**
			UNIT - III			
	5	a)	Discuss the evolution of AR.	*CO2*	*PO2*	**6**
		b)	Discuss any 4 applications of AR.	*CO2*	*PO2*	**6**
		c)	Identify, why the following examples are not AR, Justify your answer in one sentence. i. Pre Recorded Video ii. Looking at a 3D model displayed on your computer screen, unrelated to the physical world. iii. Head-Up Displays (HUDs) in Cars. iv. Snapchat Filters That Only Modify the Face v. 3D Cinema vi. A hologram of an object projected into mid-air, independent of the environment. vii. Google Earth on desktop.	*CO2*	*PO2*	**8**
			OR			
	6	a)	Discuss image formation in Pin –whole camera with neat diagram.	*CO2*	*PO2*	**6**
		b)	Define Transformation. Explain Expanding and shrinking with neat diagram.	*CO2*	*PO2*	**6**
		c)	Explain the following with matrices. i. Cartesian Coordinate system. ii. Homogeneous coordinate system.	*CO2*	*PO2*	**8**

			UNIT - IV			
	7	a)	Discuss POIST algorithm. Explain pose estimation with Homography with neat diagram and derivation.	*CO2*	*PO2*	**10**
		b)	Image is captured by the camera with a resolution of 900x780 write the intrinsic matrix.	*CO2*	*PO2*	**10**
			OR			
	8	a)	Discuss the camera calibration using Direct Linear Transformation.	*CO2*	*PO2*	**10**
		b)	Discuss the Camera calibration using a 2D pattern.	*CO2*	*PO2*	**10**
			UNIT - V			
	9	a)	List & explain core game components relating to Unity UI development. And write a step involved to Display a "hello world" UI text message.	*CO3*	*PO3*	**10**
		c)	With neat diagram, Explain the Rect Transform Anchor presents panel when Shift and Alt pressed.	*CO3*	*PO3*	**10**
			OR			
	10	a)	With illustrations, explain creation of UI button to reveal an image.	*CO3*	*PO3*	**10**
		b)	With a neat diagram and code explain displaying a radar to indicate relative locations of objects.	*CO3*	*PO3*	**10**

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