

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-V (NEW) EXAMINATION – WINTER 2024

Subject Code:3155205

Date:02-12-2024

Subject Name:Virtual Reality and Immersive Technology

Time:10:30 AM TO 01:00 PM

Total Marks:70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS
Q.1	(a) Define Virtual Reality & Explain in Brief	03
	(b) What key features make up a Virtual Reality (VR) experience, and why are they important for creating a realistic environment?	04
	(c) Provide a detailed explanation of Aural and Haptic Displays.	07
Q.2	(a) Illustrate the features of tracking technology.	03
	(b) Explain Manipulation, Navigation and Communication in Detail.	04
	(c) Explore the various applications of augmented reality (AR) in the gaming, retail, healthcare, and educational sectors. In what ways is AR changing these sectors?	07
	OR	
	(c) Discuss the key differences between augmented reality (AR) and virtual reality (VR).	07
Q.3	(a) What is mixed reality, and how does it differ from augmented reality and virtual reality?	03
	(b) Brief about Multiple-Camera Infrared Tracking	04
	(c) Discuss the key differences between marker tracking and marker-less tracking approaches in augmented reality in detail.	07
	OR	
Q.3	(a) What is the main purpose of dense tracking and mapping (DTAM) in SLAM?	03
	(b) Explain the difference between stationary tracking systems and mobile sensors. How are they used in tracking technologies?	04
	(c) Describe the concept of natural feature tracking by detection in augmented reality. How is it used to enhance object recognition and interaction in AR environments?	07
Q.4	(a) What is the purpose of the OpenVR SDK in virtual reality development?	03
	(b) Describe the key difference between parallel tracking and mapping (PTAM) and semi-direct monocular visual odometry (SVO).	04
	(c) Compare the OpenVR SDK, StreamVR SDK, and Oculus SDK. How do these SDKs help in building VR applications?	07

OR

Q.4	(a) What is the function of the Oculus SDK in VR development?	03
	(b) Explain the role of input and output technologies in mixed reality. How do they contribute to user interaction?	04
	(c) Explain how Unity XR APIs support VR development. What are some key features of Unity XR APIs that help build VR experiences?	07
Q.5	(a) What is raycasting in AR? Write applications of it.	03
	(b) Explain the concept of occlusion in AR. How can developers achieve effective occlusion in their AR applications?	04
	(c) How does Vuforia's image tracking feature work, and what are its benefits for AR development?	07
OR		
Q.5	(a) Explain light estimation in AR.	03
	(b) Discuss the features of ARCore.	04
	(c) Discuss the steps involved in setting up ARToolkit for AR development. What are the key requirements and considerations?	07
