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| **SCSA3019** | **Augmented and Virtual Reality (Elective)** | **Theory** | **CSE** |

**UNIT 1**

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| **S.No.** | **Questions (2 marks)** | **CO** | **Level** |
| 1 | Illustrate pitch, yaw and roll in 6DOF. | CO1 | L2 |
| 2 | Illustrate the term Latency. | CO2 | L2 |
| 3 | Identify the different types of virtual reality with need. | CO1 | L2 |
| 4 | Define Telepresence. List out where it is used. | CO1 | L1 |
| 5 | Sketch what type of displays is used for gaming environment. | CO3 | L3 |
| 6 | Illustrate Artificial Reality. | CO2 | L4 |
| 7 | With an example define mechanical tracking system. | CO1 | L1 |
| 8 | Correlate how data glove helps in virtual environment. | CO2 | L4 |
| 9 | Paraphrase the difference between LCD and LED HMD devices. | CO2 | L2 |
| 10 | Extract the different Floor supported devices in VR environment. | CO2 | L2 |
| 11 | Infer the difference between 3DOF and 6DOF. | CO1 | L2 |
| 12 | Classify Optical Tracking and Non optical tracking. | CO2 | L2 |
| 13 | How motion tracking works in VR? Explain DOF. | CO1 | L1 |
| 14 | List the different components of VR. | CO1 | L1 |
| 15 | Classify different tracking systems present in VR. | CO1 | L2 |
| 16 | Mention the basic features of VR systems. | CO1 | L1 |

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| **S.No.** | **Questions (16 marks)** | **CO** | **Level** |
| 1 | Tabulate the basic components of virtual reality | CO1 | L1 |
| 2 | Examine the different key elements of which helps out virtual reality experience | CO2 | L2 |
| 3 | Articulate how hardware components play a major role in virtual reality, list out with example. | CO3 | L3 |
| 4 | Classify the different display devices that helps an immersive expression document in detail | CO2 | L4 |
| 5 | How does motion tracking works? Determine the different Tracking devices that exist now. | CO2 | L3 |
| 6 | Explain the architecture of VR system. | CO1 | L1 |
| 7 | How the society is benefitted from VR? Infer in detail. | CO6 | L4 |
| 8 | Define VR Output hardware. Explain Visual displays in detail. | CO1 | L1 |

**UNIT 2**

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| **S.No.** | **Questions (2 marks)** | **CO** | **Level** |
| 1 | What is Modals in VR? | CO1 | L1 |
| 2 | Define Tracker and sensors and benefits? | CO1 | L1 |
| 3 | Compare the Digital Glove and Movement Capture process in immersive technologies | CO1 | L2 |
| 4 | Describe 3D Menus development in VR development | CO1 | L2 |
| 5 | Discuss the Advantages 3D Menus & 3DScanner in input methodologies in VR development ? | CO1 | L2 |
| 6 | Compare Hand Gesture and Body Track Interactive Techniques | CO1 | L1 |
| 7 | Describe Input and Output Interface. | CO1 | L1 |
| 8 | Discuss the advantages of Haptic Devices | CO1 | L2 |
| 9 | Describe Object Grasp activities in VR | CO1 | L1 |
| 10 | Exaplain the purpose of haptic interface software | CO1 | L3 |
| 11 | Differentiate active and passive markers | CO3 | L4 |
| 12 | Define Audiorendering | CO1 | L1 |
| 13 | List the 6 types of Grasp | CO1 | L1 |
| 14 | Explain any 2 wearable sensor device | CO1 | L2 |
| 15 | What is inertial tracking. Mention the instruments used for it | CO1 | L2 |
| 16 | How would you render the appropriate weather in VR world | CO3 | L3 |

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| **S.No.** | **Questions (16 marks)** | **CO** | **Level** |
| 1 | Discuss the Input and Output Interface and advantages of Virtual Reality eco system | CO1 | L2 |
| 2 | Explain the detail concepts of Input -- Tracker, Sensor, Digital Glove, Movement Capture in Virtual Reality | CO1 | L2 |
| 3 | Discuss Video-based Input, 3D Menus & 3DScanner Input scenarios in Virtual Reality | CO1 | L4 |
| 4 | Explain in detail about Interactive Techniques in Virtual Reality such as Body Track, Hand Gesture, 3D Manus, Object Grasp | CO1 | L3 |
| 5 | Discuss the different techniques used in Audio Rendering | CO3 | L1 |
| 6 | Define Hand Gesture. Classify the types of hand gestures and explain. | C03 | L2 |
| 7 | Discuss the Haptic Rendering techniques | CO1 | L2 |
| 8 | Explain Body Tracking | CO1 | L3 |

**UNIT 3**

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| **S.No.** | **Questions (2 marks)** | **CO** | **Level** |
| 1 | Identify the use of Computer Graphics in Virtual Reality | CO1 | L2 |
| 2 | Quote the use of Stereoscopy in virtual reality | CO1 | L1 |
| 3 | Interpret shutter system with respect to stereoscopy | CO2 | L2 |
| 4 | How do you apply rendering in 3d models in real-time? | CO1 | L3 |
| 5 | Differentiate between real-time rendering and offline-rendering. | CO1 | L2 |
| 6 | Summarize the need to manage of Large Scale Environments? | CO6 | L5 |
| 7 | Define VR Interaction Framework. | CO3 | L1 |
| 8 | Connect CRYENGINE and Amazon Lumberyard. | CO3 | L4 |
| 9 | Compare and Contrast Vega and Java 3D. | CO3 | L2 |
| 10 | Infer the impact of virtual reality in human life in your own words. | CO5 | L4 |
| 11 | What is CRT? | CO2 | L1 |
| 12 | Define Vega? | CO3 | L1 |
| 13 | Explain some tools used in VR Environment | CO5 | L2 |
| 14 | Define Computer Graphics and their importance in VR | CO3 | L1 |
| 15 | What is real time rendering techniques? | CO3 | L2 |
| 16 | Difference between hardware and software on stereoscopic display | CO3 | L2 |

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| **S.No.** | **Questions (16 marks)** | **CO** | **Level** |
| 1 | Articulate how CRT, Raster Scan and Vector Scan used in creating an Virtual Reality Scenario. | CO2 | L3 |
| 2 | Categorize the different stereoscopic technologies along with the different software used for it. | CO2 | L4 |
| 3 | Design the steps involved in Real Time Rendering for Large-Scale Forest Scenes. | CO6 | L6 |
| 4 | Identify and explain the list of tools in Virtual Reality. | CO3 | L2 |
| 5 | Identify any visualization development toolkit for real-time simulation. Explain the same in detail. | CO3 | L4 |
| 6 | How will you assess the evaluation metrics for 3D interfaces | CO3 | L3 |
| 7 | Explain the application of VR in Digital Environment | CO5 | L3 |
| 8 | Discuss the 3D user interface techniques with virtual environment | CO4 | L3 |

**UNIT 4**

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| **S.No.** | **Questions (2 marks)** | **CO** | **Level** |
| 1 | Illustrate Augmented Reality with an example. | CO2 | L3 |
| 2 | List the applications of Augmented Reality. | CO2 | L2 |
| 3 | Associate Augmented Reality with other technologies. | CO5 | L2 |
| 4 | Assess the camera parameters involved in camera calibration. | CO2 | L5 |
| 5 | Identify the major hardware and software components of AR system. | CO2 | L2 |
| 6 | Distinguish marker-based and marker-less Augmented Reality. | CO5 | L2 |
| 7 | Point out the importance of image quality in marker-based AR application. | CO5 | L4 |
| 8 | Interpret how pattern recognition techniques are related to AR. | CO5 | L3 |
| 9 | Name the platforms supported by AR Toolkit. | CO2 | L1 |
| 10 | Compare and Contrast the advantages and disadvantages of AR Toolkit. | CO2 | L2 |
| 11 | List out the features of AR Toolkit | CO4 | L2 |
| 12 | Discuss about AR Markers. | CO4 | L2 |
| 13 | What is Polka dot pattens? | CO4 | L1 |
| 14 | Summarize about StatPR. | CO4 | L2 |
| 15 | List the necessary tasks needed for calibrating virtual cameras | CO4 | L2 |
| 16 | List the pros and cons of Location based applications. | CO4 | L2 |

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| **S.No.** | **Questions (16 marks)** | **CO** | **Level** |
| 1 | Sketch down the system structure of Augmented Reality with a neat diagram and Explain. | CO4 | L3 |
| 2 | Breakdown the techniques involved in Camera parameters and Camera Calibration. | CO4 | L4 |
| 3 | Summarize the working behind Marker-based Augmented Reality. | CO4 | L5 |
| 4 | Discuss the brief history of Augmented Reality Software development. | CO4 | L5 |
| 5 | Design the steps involved in AR Toolkit to develop a simple application. | CO4 | L6 |
| 6 | Discuss briefly about Potential Issues with AR Software. | CO4 | L5 |
| 7 | Summarize about Pattern Recognition. | CO4 | L5 |
| 8 | Explain about Interactive E-learning System using Pattern Recognition and AR. | CO4 | L6 |

**UNIT 5**

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| **S.No.** | **Questions (2 marks)** | **CO** | **Level** |
| 1 | Point out the applications of Virtual Reality in Digital Entertainment. | CO5 | L4 |
| 2 | How is VR affecting the film industry? Interpret. | CO5 | L3 |
| 3 | Summarize the problems encountered in VR post-production in film & television. | CO5 | L5 |
| 4 | Compare and Contrast the advantages and disadvantages of using VR for fitness. | CO5 | L2 |
| 5 | Do video games really count as exercise? Relate with an example. | CO5 | L3 |
| 6 | Define 3d User Interface. | CO5 | L1 |
| 7 | List the devices used for virtual reality and 3D interaction. | CO5 | L2 |
| 8 | Discuss the tasks involved in Selection and Manipulation techniques for 3D environments. | CO5 | L2 |
| 9 | State the purpose of evaluation of 3D user interface. | CO5 | L1 |
| 10 | How has society benefitted from VR? Infer. | CO5 | L4 |
| 11 | What is virtual Reality and how does it affect today’s technology? | CO5 | L3 |
| 12 | How VR is benefitted in fitness? | CO5 | L3 |
| 13 | What is Google cardboard? How does it fit into the VR World? | CO5 | L3 |
| 14 | What language used to compose your virtual world? | CO5 | L3 |
| 15 | How might the virtual world change the world of work? | CO5 | L3 |
| 16 | Which VR game is usable as a control condition in a VR application study? | CO5 | L2 |

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| **S.No.** | **Questions (16 marks)** | **CO** | **Level** |
| 1 | Identify the role played by VR technology in film and TV production. Explain in detail. | CO5 | L2 |
| 2 | “VR in sports” – Analyze and Illustrate with real-time scenario. | CO5 | L4 |
| 3 | Discuss the 3D user interaction techniques with virtual environment. | CO5 | L5 |
| 4 | How will you assess the evaluation metrics for 3D interfaces? | CO5 | L5 |
| 5 | Explain the applications of VR in Digital Environment. | CO5 | L2 |
| 6 | Discuss about major User Task in Virtual Reality. | CO5 | L2 |
| 7 | Which is the most important technical challenge for Mixed Reality? Can VR make people's mind lazy? | CO5 | L2 |
| 8 | Virtual reality applications: a systematic review of learning, training, and development outcomes? Can Virtual Reality be a Substitute for Real Life Experiences Justify. | CO5 | L2 |