

**T.E. (Computer Engineering)**  
**AUGMENTED AND VIRTUAL REALITY**  
**(2019 Pattern) (Semester-II) (Elective - II) (310254 B)**

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Solve Q.1 or Q.2, Q.3 Q.4, or Q.5 or Q.6, Q.7 or Q.8.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.

- Q1) a) What is rendering system? Describe different methods of aural rendering. [6]
- b) Explain geometric based rendering system in detail? [6]
- c) Differentiate between aural and haptic representation in Virtual reality. [6]

OR

- Q2) a) Describe haptic rendering methods in detail. [6]
- b) List out different methods for simplifying the amount of information needed to pass between simulation and haptic rendering. Explain any three in detail. [6]
- c) How to render complex haptic scenes with force displays? [6]

- Q3) a) What are the four categories of substance in the virtual world? Explain. [6]
- b) What is Wayfinding? Enlist real and virtual-world aids to improve wayfinding in navigation. [6]
- c) State side effects of using VR System. [6]

OR

- Q4) a) State and explain different forms of manipulating a virtual world. [6]
- b) What is Direction Selection? Enlist seven ways of selecting direction. [6]
- c) What is collaborative interaction? Explain. [6]

P.T.O.

- Q5) a) What is augmented reality? Enlist different ingredients of an augmented reality experience. [6]
- b) Describe Registration and Latency related to AR systems. [6]
- c) How does augmented reality work? Explain in detail [5]

OR

- Q6) a) What is Depth Cues? Explain Monoscopic and Stereoscopic image depth in detail. [6]
- b) What are different categories of sensors that are used in AR systems? [6]
- c) Explain history of Augmented Reality. [5]

- Q7) a) Write short note on: [6]
- i) Realistic and Abstract representation
- ii) Physical & Conceptual representation
- b) Describe different software used to create content for the augmented reality application. [6]
- c) Explain software tools used for content creation in AR? [5]

OR

- Q8) a) Explain the following terms related to interaction in virtual world: [6]
- i) Manipulation
- ii) Communication
- iii) Navigation
- b) What are marker based and marker-less tracking system in augmented reality? [6]
- c) State advantages and disadvantages of mobile augmented reality. [5]

