

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING VII SEMESTER B.TECH.

MAKE UP END SEMESTER EXAMINATION (JAN 2024)

SUBJECT: AUGMENTED AND VIRTUAL REALITY (PE-III) - CSE 4051

Duration: 3 Hours Date: 05/01/2024 MAX.MARKS: 50

Note:

1. Missing data may be assumed suitably.2.30 PM

| Q.No | Questions | Marks | CO /CLO | AHEP LO | Blooms Taxonomy level |
|-------------|---|-------|------------|------------|-----------------------------|
| 1 a) | Detail the technology behind the data and power glove with a neat sketch. | 3 | 1 | 1,3 | 2 |
| 1b) | Differentiate between virtual and augmented reality in terms of scope and illustration. | 3 | 1 | 1,3 | 2 |
| 1c) | Which businesses are using or developing AR technology? Could you summarize a few recent developments in augmented and virtual reality? | 4 | 1 | 1,3 | 3 |
| 2a) | Why does augmented reality typically improve our visual sense of the real world? | 3 | 2 | 3 | 4 |
| 2b) | When there isn't a tangible object with all the necessary characteristics to convey the sense of touch, providing a realistic sensory impression might be challenging. Justify? | 3 | 2 | 3 | 4 |
| 2c) | Write down the various implications for stereo viewing devices. Mention how auto-stereoscopic displays function. | 4 | 2 | 3 | 2 |
| 3 a) | Examine the three crucial terms related to object alignment and measurement. | 3 | 3 | 2 | 4 |
| 3 b) | Categorize the marker tracker pipeline's five stages. | 3 | 3 | 2 | 4 |
| 3c) | Analyze the homography-based POSE estimation method. How is pose refinement's reprojection error minimized? | 4 | 3 | 2 | 4 |



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| 4a) | Examine the methods used to synchronize the haptic and visual pipelines for both virtual and augmented reality modalities. | 3 | 4 | 2,3 | 4 |
|-------------|---|---|---|-------|---|
| 4 b) | Recognize the issues with displays that aren't synchronized between augmented and virtual reality modes? | 3 | 4 | 2,3 | 4 |
| 4c) | What is the hierarchy of the three phases in the graphics rendering pipeline? Analyze every phase in depth. | 4 | 4 | 2,3 | 4 |
| 5a) | Find and discuss a model that provides a detailed mathematical description of shapes. | 3 | 5 | 1,3,5 | 4 |
| 5b) | Outline the prominent features of Polhemus 3D scanners. How do you compare Deltasphere and Polhemus scanners? | 3 | 5 | 1,3,5 | 2 |
| 5c) | Compare and contrast the processes involved regarding the geometric modeling techniques used in Surface vs. Solid modeling. List the benefits and drawbacks of each modeling technique. | 4 | 5 | 1,3,5 | 3 |

Abbreviations:

M-Marks

CO/CLO- Course Outcome (NBA)/Course Learning Outcome (IET).

CLO - Course Learning Outcome as per AHEP 4

BT - Blooms Taxonomy Level