Answer THREE questions.

Question 1.

a) Describe the concepts of immersion and presence and explain how these two concepts are related.

[11 Marks]

b) Describe the different methods for measuring presence and the shortcomings each exhibits.

[11 Marks]

c) Discuss the relationship between co-presence and presence. What are the implications for a person exhibiting co-presence in social situations, and when might this be desirable or undesirable?

[11 Marks]

[Total 33 Marks]

Question 2.

a) Describe the elements of Ellis's *content*, *geometry*, *dynamics* model of virtual environments.

[16 Marks]

b) A distributed virtual environment system creates a space within which users can collaborate. Discuss the main approaches to the creation of such a space by referring to example DVE systems.

[17 Marks]

[Total 33 Marks]

Question 3.

a) Describe the different types of depth cue that are available on a standard desktop system. What additional cues are available in a head-tracked stereo system?

[10 Marks]

b) Describe the problem of cross-talk in stereo systems. Give examples of systems where it is likely to occur and where it does not occur.

[9 Marks]

c) What problems does Robinett identify with most head-mounted displays?

[14 Marks]

[Total 33 Marks]

Question 4.

a) What is body-relative interaction in immersive virtual environments? Give examples of body-relative interaction techniques.

[11 Marks]

b) Discuss the problem of latency in tracking. Refer to sources of latency, experimental results on the effects of latency on task performance and techniques that are used to address the problem.

[11 Marks]

c) Describe Stoakley's World-in-Miniature technique and its strengths and weaknesses for object manipulation and locomotion control.

[11 Marks]

[Total 33 Marks]

Question 5.

a) Describe the three different types of techniques that can be used for accelerating the rendering of large environments.

[11 Marks]

b) Describe briefly how level of detail control can be used for maintaining a constant frame rate.

[11 Marks]

c) Explain the difference between discrete and continuous level-of detail methods. Briefly describe a method for continuous level-of-detail.

[11 Marks]

[Total 33 Marks]

Question 6.

a) Explain how QuickTime VR can be used for real-time rendering of complex environments.

[13 Marks]

b) Outline the method hierarchical image caching, including its pre-processing and run-time stages.

[13 Marks]

c) How do the above two techniques compare? In what cases would one be preferable to the other?

[7 Marks]

[Total 33 Marks]

END OF PAPER