(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 1046   Roll No. ☐☐☐☐☐☐☐☐☐

B. Tech.

(SEM. VIII) EXAMINATION, 2006-07

VIRTUAL REALITY

Time : 3 Hours]   *[Total Marks : 100*

Note :   *(1)   Attempt all questions.*

(2)   All questions carry equal marks.

1   Answer any **four** parts of the following :   5×4=20

(a)   What do you understand by virtual reality? What are differences between virtual reality applications and multimedia applications?

(b)   What are the factors which affect the quality and usability of a virtual reality applications. Explain briefly.

(c)   What is meant by the term "visual realism" ? Describe a real world application of VR technology which demands high visual realism.

(d)   Explain the following terms in context of virtual environment :

(i)   Degrees of freedom

(ii)   Augmented reality

(iii)   Latency

(iv)   Telepresence.

(e)	What is a scene graph? Describe how scene graphs are used for rendering complex visual scenes.

(f)	Explain the following transformations with the help of suitable example: Rotation and Scaling.

2	Attempt any **two** parts of the following :	**10×2=20**

(a)	Discuss the techniques used for selection and manipulation of objects in virtual environments.

(b)	Describe the purpose of following nodes in VRML.
	Anchor node,	Collision node,
	Group node,	Shape node.

(c)	(i)	What do you understand by instancing of a node? Explain the use of DEF and USE keywords supported by VRML.

	(ii)	What is meant by prototypes? What are the possible uses of prototypes? How is a prototype defined? Use suitable example for illustration.

3	Answer any **two** parts of the following :	**10×2=20**

(a)	(i)	Define Event. Describe how a loop created during an event cascade is broken.

	(ii)	Explain the purpose of ROUTE statement with an example.

(b)	Explain how the fields and events of a script node can be accessed by other nodes.

(c)	What do you understand by asynchronous scripts? How are they executed? Explain with suitable example.

4   Attempt any **two** parts of the following :   **10×2=20**

     (a)   (i)   Describe the following interpolators : Position interpolator, Colour interpolator.

         (ii)   What is the difference between interpolator and script?

     (b)   Discuss the lighting model of VRML. Describe the light source nodes supported by VRML with due emphasis on differences among them.

     (c)   What are some sources of latency in virtual environments? What effects does this latency have on the user of the system?

5   Attempt any **two** parts of the following :   **10×2=20**

     (a)   Discuss the reasons why 3D sounds has been underutilized in virtual reality applications. Further explain how HRTFs can be useful in generating realistic 3D sound effects in virtual environments.

     (b)   (i)   What is an avatar? Explain.

         (ii)   What is the purpose of LOD node? Describe its use with the help of example.

     (c)   Write notes on the following :

         (i)   Texture mapping in VRML

         (ii)   Limitations of virtual reality application.

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