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06CS65

Sixth Semester B.E. Degree Examination, Dec.2013/Jan.2014
Computer Graphics and Visualization

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions, selecting at least TWO questions from each part.***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

PART – A

1 a. Briefly explain the applications of computer graphics. **(08 Marks)**

b. Explain the process of image formation with pinhole camera as an example. Derive the expression for angle of view. **(12 Marks)**

2 a. Write an openGL recursive program for 3D sierpinsky gasket with relevant comments. **(12 Marks)**

b. Explain the seven major groups of functions of a good API. **(08 Marks)**

3 a. Enlist the features of good interactive program. **(06 Marks)**

b. How pop-up menus are created using GLUT? Illustrate with an example. **(10 Marks)**

c. What is double buffering? Explain the advantages of double buffering. **(04 Marks)**

4 a. What are vertex arrays? Show how vertex arrays can be used to represent a cube in openGL. **(10 Marks)**

b. A square in a two dimensional system is specified by its vertices (6, 6) (10, 6) (10, 10) and (6, 10). Implement the following by its first finding a composite transformation matrix for the sequence of transformation.

i) Rotate the square by 45° about its vertex (6, 6)

ii) Scale the original square by a factor of 2 about its centre. **(10 Marks)**

PART – B

5 a. Obtain the matrix representation for rotation of a point about an arbitrary axis in a 3D space. **(10 Marks)**

b. Show that the following three dimensional sequences are commute:

i) A rotation and a uniform scaling.

ii) Two rotations about the same axis. **(10 Marks)**

6 a. Briefly explain the perspective and parallel views in openGL. Give example. **(10 Marks)**

b. What is mesh? With example explain how meshes are generated. **(10 Marks)**

7 a. Describe the phong lightening model. What are its advantages? **(10 Marks)**

b. Briefly explain the different types of light sources supported by openGL. **(10 Marks)**

8 a. Use Leang Barsky line clipping algorithm to clip a line from starting point (30, 15) and ending point (65, 35) against the window having its lower left corner at (40, 10) and upper right corner at (75, 25). **(10 Marks)**

b. Use Bresenham's line algorithm to digitalize a line from point (0, 0) to point (6, 4) **(10 Marks)**

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