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Sixth Semester B.E. Degree Examination, June 2012
Computer Graphics and Visualization

Time: 3 hrs.

Max. Marks:100

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

PART – A

- 1 a. Briefly explain any two applications of computer graphics. (04 Marks)
b. Explain the concept of pinhole camera of an imaging system. Also derive the expression for angle of view. (06 Marks)
c. Discuss the graphics pipeline architecture, with the help of a functional schematic diagram. (10 Marks)
- 2 a. With the help of a diagram, describe the open GL interface. (04 Marks)
b. Write explanatory notes on: i) RGB color model; ii) Indexed color model. (06 Marks)
c. Write an open GL recursive program for 2D-sierpinski gasket with relevant comments. (10 Marks)
- 3 a. What are the two major characteristics that describe the logical behavior of an input device? Explain the different clauses of logical input devices. (08 Marks)
b. List the various features that a good interactive program should include. (04 Marks)
c. Write an open GL program, to demonstrate the hierarchical means, to draw a rectangle and to increase or decrease the size of the rectangle. (08 Marks)
- 4 a. Explain the procedure involved in transforming the world frame to camera/eye frame using the model view matrix. (10 Marks)
b. Write an open GL program to demonstrate the use of homogeneous coordinate transformations and simple data structure for representing a rotating cube with color interpolation. (10 Marks)

PART – B

- 5 a. Define and represent the following 2-D transformations in homogeneous coordinate system: i) Translation; ii) Rotation; iii) Scaling; iii) Reflection. (12 Marks)
b. What is concatenation transformation? Explain rotation about a fixed point. (08 Marks)
- 6 a. Discuss the following open GL functions: i) gluLook At; ii) gluPerspective. (06 Marks)
b. Write a note on hidden surface removal. (04 Marks)
c. Derive the projection matrices for perspective viewing. (10 Marks)
- 7 a. Describe any two types of light sources that are sufficient for rendering most simple scenes. (04 Marks)
b. Discuss the ping-lighting model. (08 Marks)
c. What are the different methods available for shading a polygon? Discuss any two. (08 Marks)
- 8 a. Explain in brief, Cohen-Sutherland line clipping algorithm with possible cases. (08 Marks)
b. What do you mean by antialiasing? Explain. (04 Marks)
c. Discuss the Bresenham's rasterization algorithm. (08 Marks)