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10CS65

**Sixth Semester B.E. Degree Examination, June/July 2018**  
**Computer Graphics & Visualization**

Time: 3 hrs.

Max. Marks:100

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

**PART - A**

- 1 a. Explain the concept of pinhole camera of an imaging system. Also derive the expression for angle of view. (10 Marks)  
b. Discuss the graphics pipeline architecture with the help of a functional schematic diagram. (10 Marks)
- 2 a. Explain the OpenGL primitives and attributes with examples. (06 Marks)  
b. Explain the Aspect ratio and viewports with respect to OpenGL. (04 Marks)  
c. Explain a 2D Sierpinski gasket program in detail with comments. (10 Marks)
- 3 a. Explain the different classes of logical input devices. (06 Marks)  
b. Explain Request mode and Event mode model. (08 Marks)  
c. Explain logic operations in input interactions. (06 Marks)
- 4 a. Explain the procedure involved in transforming the world frame to camera/eye frame using the model view matrix. (10 Marks)  
b. Explain a modeling a colored cube in detail with the OpenGL functions used to create a colored cube. (10 Marks)

**PART - B**

- 5 a. Explain translation, rotation and scaling and also derive a translation, rotation and scaling matrix using homogeneous co-ordinate system. (10 Marks)  
b. Explain Quaternions and derive the matrix. (10 Marks)
- 6 a. Discuss the following OpenGL functions : (i) gluLookAt (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. Explain the Phong lighting model. (10 Marks)  
b. Explain the polygon shading in detail. (10 Marks)
- 8 a. Explain Cohen-Sutherland line clipping algorithm in detail. (10 Marks)  
b. Explain Hidden-surface Removal using Object Space and Image Space approaches. (10 Marks)

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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.