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Future Vision

By K B Hemanth Raj

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10CS65

Sixth Semester B.E. Degree Examination, Dec.2017/Jan.2018

Computer Graphics and 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. Discuss the applications of computer graphics. (06 Marks)
 b. With an aid of a functional schematic, describe the graphics pipeline with major steps in the imaging process. (08 Marks)
 c. Explain the human visual system. (06 Marks)
2. a. What is an OpenGL interface? Write an OpenGL program for a 2D-Sierpinski gasket using midpoint of each triangle. (10 Marks)
 b. Explain any two control functions used in OpenGL. (04 Marks)
 c. Explain the additive, subtractive and indexed color formation in computer graphics. (06 Marks)
3. a. What are the various classes of logical input devices that are supported by OpenGL? Explain the functionality of each of these classes. (10 Marks)
 b. Enlist the various features that a good interactive program should possess. (04 Marks)
 c. Suppose that the OpenGL window is 500×50 pixels and the clipping window is a unit square with the origin at the lower left corner. Use simple XOR mode to draw erasable lines. (06 Marks)
4. a. Explain the complete procedure of converting a world object frame into camera frame using the model view matrix. (12 Marks)
 b. Explain translation rotation, scaling and shearing with respect to 2-dimensions. (08 Marks)

PART – B

5. a. What is concatenation transformation? Explain rotation about a fixed point. (08 Marks)
 b. Explain how quaternions are used in rotation in a three-dimensional space, also list some of its advantages. (12 Marks)
6. a. Explain the various types of views that are employed in computer graphics systems. (10 Marks)
 b. Explain $g/Frustum()$ with syntax. (06 Marks)
 c. Define the term Axonometric projection, also list its types. (04 Marks)
7. a. Explain phong-lighting model. (10 Marks)
 b. Write a program to display a set of values $\{f_i\}$ as a rectangular mesh. (07 Marks)
 c. List the possible light sources in OpenGL. (03 Marks)
8. a. Explain the cohen-sutherland line clipping algorithm in detail. (10 Marks)
 b. Discuss the Bresenham's rasterization algorithm. How is it advantageous when compared to other existing methods? Describe. (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.