USN | | | | | | | | | | | 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 posses. **(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 glFrustrum( ) 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 {fi} 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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