USN ☐☐☐☐☐☐☐☐☐☐

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 g/Frustrum( ) 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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