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10CS65

Sixth Semester B.E. Degree Examination, July/August 2022
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.　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 all three input modes with relevant figures. **(09 Marks)**
　b.　Describe the importance of display lists. Explain the OpenGL functions used to define and execute a display list with a suitable example. **(07 Marks)**
　c.　Discuss the functionality of Display Callback (glutDisplayFunc( )) and Idle Callback (glutpostRedisplay( )). **(04 Marks)**

4　a.　List and explain different Frames in OpenGL. **(06 Marks)**
　b.　Explain how to define Vertex Arrays and color Arrays to store vertex and color values. **(07 Marks)**
　c.　Explain Affine transformations. **(07 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 3 types of light-material interactions with figures. **(06 Marks)**
　b.　Describe point sources and spotlight sources with figures. **(06 Marks)**
　c.　Describe Phong Lighting Model. **(08 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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