USN ☐☐☐☐☐☐☐☐ **18CS62**

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, choosing ONE full question from each module.*

Module-1

1 a. Explain Refresh Cathode ray tube with neat diagram.   (10 Marks)
   b. What is Computer Graphics? Explain the application of Computer Graphics.   (10 Marks)

OR

2 a. With a neat diagram, explain the architecture of a raster display system with integrated display processor.   (10 Marks)
   b. Explain Bresenham's Line drawing algorithm, with an example.   (10 Marks)

Module-2

3 a. What is the need of Homogeneous Coordinate System? Explain Translation , Rotation and Scaling in 2D Homogeneous Coordinate System, with matrix representation.   (10 Marks)
   b. Explain with example any two algorithms used to identify interior and exterior area of a polygon.   (05 Marks)
   c. Explain two dimensional viewing transformation pipe line.   (05 Marks)

OR

4 a. Explain Scan Line polygon fill algorithm.   (10 Marks)
   b. Explain different OpenGL routines used for manipulating display window.   (05 Marks)
   c. Explain OpenGL 2D – viewing function.   (05 Marks)

Module-3

5 a. What is Clipping? Explain Cohen – Sutherland Line Clipping algorithm, with suitable example.   (10 Marks)
   b. Explain Basic Illumination Model and explain Phong's Lighting model.   (10 Marks)

OR

6 a. Explain Sutherland – Hodgman Polygon Clipping algorithm .Find the final clipping polygon for the following Fig. Q6(a).   (10 Marks)
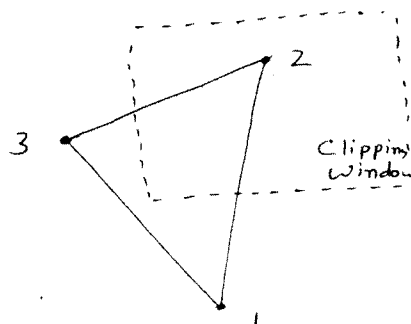

Fig. Q6(a)

   b. Write an OpenGL program to rotate a cube in all directions.   (10 Marks)

Module-4

7   a. Explain with example, Depth buffer algorithm used for visible surface detection. Discuss the advantages and disadvantages. **(10 Marks)**
    b. Explain 3D viewing pipeline with neat diagram and transformation from World to viewing coordinates. **(10 Marks)**

OR

8   a. Explain Orthogonal Projection in details. **(10 Marks)**
    b. Explain Perspective Projection with reference point and vanishing point with neat diagram. **(05 Marks)**
    c. Explain Symmetric Perspective – Projection Frustum. **(05 Marks)**

Module-5

9   a. What are the different Logical input devices and explain with an example. **(10 Marks)**
    b. Discuss the various input modes with diagram. **(05 Marks)**
    c. Explain the creation of display list with an example. **(05 Marks)**

OR

10 a. List the properties of Bezier curve and also explain Beizer techniques of generating curves. **(10 Marks)**
    b. Describe the various features that a good interactive program should incorporate. **(05 Marks)**
    c. Explain how menus in OpenGL are created. **(05 Marks)**

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