USN | | | | | | | | | | 18CS62

Sixth Semester B.E. Degree Examination, June/July 2025
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. Define Computer Graphics. Briefly explain the application of computer graphics. **(10 Marks)**
   b. Explain Refresh Cathode Ray Tube with a neat diagram. **(10 Marks)**

OR

2. a. Explain Bresenham Line Drawing algorithm, using Bresenham's Line Drawing algorithm digitize the line with end points (20, 10) to (30, 18). **(10 Marks)**
   b. With a neat diagram, explain the architecture of raster display system with integrated display processor. **(10 Marks)**

Module-2

3. a. Explain with example any two algorithms used to identify interior and exterior area of a polygon. **(05 Marks)**
   b. Explain two dimensional viewing transformation pipe line. **(05 Marks)**
   c. Illustrate the need of homogeneous co-ordinate system and demonstrate translation, rotation, scaling 2 D homogeneous co-ordinate system with matrix representation. **(10 Marks)**

OR

4. a. Explain OpenGL 2D- viewing function. **(05 Marks)**
   b. Explain different OpenGL routines used for manipulating display window. **(05 Marks)**
   c. Explain scan line polygon file algorithm. **(10 Marks)**

Module-3

5. a. What is Clipping? Explain Cohen-Southerland line clipping algorithm, with suitable example. **(10 Marks)**
   b. Explain different light sources. **(10 Marks)**

OR

6. a. Explain Basic Illumination Model and Phong's Lighting Model. **(10 Marks)**
   b. Explain Southerland-Hodgman polygon clipping algorithm. Find the final clipping polygon for the following Fig.Q.6(b).
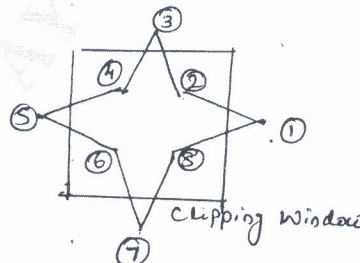

Fig.Q.6(b)

(10 Marks)

Module-4

7 a. With a neat diagram, explain 3D viewing pipeline and transformation form world to viewing co-ordinates. **(10 Marks)**

   b. Explain with example, depth buffer algorithm used for visible surface detection. Discuss the advantages and disadvantages. **(10 Marks)**

OR

8 a. With a neat diagram, explain perspective projection with reference point and vanishing point. **(05 Marks)**

   b. Explain symmetric perspective-projection frustum. **(05 Marks)**

   c. Explain orthogonal projection in details. **(10 Marks)**

Module-5

9 a. List the properties of Bezier curve and also explain Bezier Technique of generating curves. **(10 Marks)**

   b. Elaborate the following with the suitable OpenGL function using code snippet:
   i)   GLUT mouse function
   ii) GLUT keyboard function. **(10 Marks)**

OR

10 a. What are the different logical input devices and explain with an example? **(10 Marks)**

   b. Discuss the various input modes with diagrams. **(10 Marks)**

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