

**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 pipeline. (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)

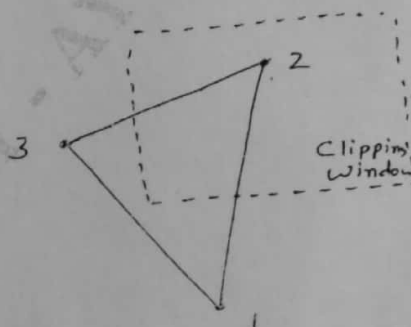
Module-3

- 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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