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## 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

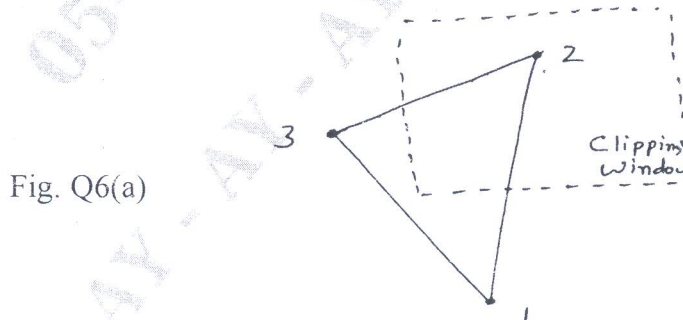
- 4 a. Explain Scan Line polygon fill algorithm. (10 Marks)
- b. Explain different OpenGL routines used for manipulating display window. (05 Marks)
- c. Explain OpenGL 2D - viewing function. (05 Marks)

### 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)



- 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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