SE(COMP.) | SEM-III | R-20 'C' scheme | C.G. | 12|06|25.

(3 Hours) Total Marks 80

N.B: 1) Question **number 1** is compulsory.
2) Attempt **any three** out of the remaining.
3) Assume suitable data if **necessary** and justify the assumptions.
4) Figures to the **right** indicate full marks.

1 a) Define and explain the following terms with example [05]
i. Scan Conversion
ii. Rasterization

b) Prove that two successive rotations are additive i.e $R(\theta_1).R(\theta_2) = R(\theta_1+\theta_2)$ [05]

c) Write a flood fill procedure to fill a polygon using the 8-connected approach. [05]

d) Write short notes on [05]
i. Motion Capture in Animation
ii. Animation Deformation

2 a) Write a Bresenham's Line Drawing Algorithm. Apply this algorithm to find pixel coordinates along the line path. The endpoint coordinates of the line segment are (9, 18) and (14, 22) [10]

b) Define window and viewport. Derive the composite transformation matrix for a window-to-viewport transformation. [10]

3 a) Derive a 2D composite transformation matrix to reflect an object about a line, y = mx [10]

b) Explain what is meant by the Bspline curve. Also, explain the properties of the Bezier and Bspline curve. [10]

4 a) Write and explain the hidden surface removal algorithm with an example [10]

b) What are the drawbacks of the Sutherland Hodgeman polygon clipping algorithm? How Weiler Atherton polygon clipping algorithm overcome these drawbacks? [10]

5 a) Discuss and derive all equations of midpoint Circle drawing algorithm and write an algorithm [10]

b) Clip the line segment using the Cohen Sutehrland line clipping algorithm. The Coordinates of window boundaries are (Xwmin, Ywmin) = (4, 4) and (Xwmax, Ywmax) = (10, 9), and the coordinates of two endpoints of a line segment are (2, 5) and (8, 11) [10]

6 a) What is animation? What is traditional animation technique? Explain any 5 principles of animation. [05]

b) Explain parallel and perspective projections. Derive the matrix for the perspective projection. [05]

c) Write short note on Raster scan display [05]

d) What is an antialiasing? Explain any 3 antialiasing techniques [05]

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