(3 Hours) [80 Marks]

NB: - 1) **Solve any four questions.**

2) **Figures to the right indicate full marks.**

3) **Assume suitable data wherever necessary.**

Q.1   a) Explain in detail ray tracing.   **10**

b) The coordinates of four data points P_0, P_1, P_2, P_3 are: (2,2,0), (2,3,0), (3,3,0), **10** (3,2,0) respectively. Find the equation of the Bezier curve and determine the coordinates of points on curve for ten different values of u.

Q.2   a) Explain the Z buffer algorithm in detail.   **10**

b) Explain in details the parallel and Perspective projections.   **10**

Q.3   a) The Pyramid defined by the coordinates A (0,0,0), B (1,0,0), C (0,1,0) and **10** D (0,0,1) is rotated 45^0 about the line L that has the direction V = J + K and passing through point C (0,1,0). Find the coordinates of the rotated figure. Show it on Graph paper.

b) Generate a line y = 2x + 10 using Bresenham's line generation algorithm.   **10**

Q.4   a) Find the reflection of a triangle whose vertices are A (1, 1), B (5, 1),   **10** C (1, 5) about the line Y = 2x + 10.

b) Explain in detail the Cohen & Sutherland line clipping algorithm.   **10**

Q.5   a) Explain in detail edge fill algorithm.   **10**

b) Write Short note on Product Data Exchange format.   **10**

Q.6   **Write short note on: -**   **20**

a) Geometric Modelling   **5**

b) Anti Aliasing   **5**

c) Significance of Homogeneous coordinate   **5**

d) Features and applications of analysis software   **5**

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