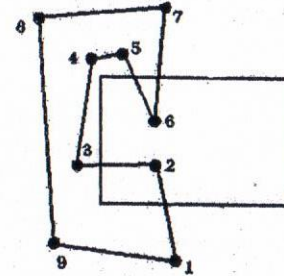


3. (a) Show that perpendicular lines remain perpendicular after transformation. (5)
- (b) Define the following terms :
- (i) Aspect ratio
- (ii) Persistence (2)
4. (a) Explain briefly an area subdivision algorithm for visible surface determination. (5)
- (b) List the two methods to specify motion between two keyframes. (2)
5. (a) Differentiate between parallel projection and perspective projection. List the various types, merits and demerits of each. (5)
- (b) What is halftoning? What is its drawback? (2)

SECTION B

6. (a) What is interlacing and what is its advantage? Calculate the time spent in scanning each row of the system having resolution 2560 by 2048 and refresh rate of 60 frames per second. Assume that horizontal and vertical retrace times are negligible. (4)

- (b) Explain two basic techniques for producing color displays with a CRT. (4)
- (c) What are homogeneous coordinates, and why are they used in computer graphics? (2)
7. (a) Explain the Liang barsky clipping algorithm. (5)
- (b) Write down the steps to clip the polygon given below using Sutherland Hodgeman algorithm. (5)



8. (a) Show the working of scan line fill algorithm for polygon A(5,4) B(2,10) C(11,14) D(8,8) and E(2,16). Also built global edge table and active edge table to find out the span of pixels to be drawn upto scan line 9. (6)
- (b) Show that the transformation matrix for a reflection about the line $y = x$ is equivalent to a reflection relative to the x axis followed by a counter clockwise rotation of 90° . (4)

9. (a) Obtain the 3d composite transformation matrix to successively rotate an object by -90 about the Y axis, reflect through XZ plane and uniformly double the size of the object. Use homogenous coordinates. (5)
- (b) Assume that an object is to be projected using Dimetric projections, derive the angles by which the object must be rotated so foreshortening along z-axis is $\frac{1}{2}$. Also compute the foreshortening along x and y axis. (5)
10. (a) Given a Bezier curve $Q(t)$ defined by points P_1, P_2, P_3, P_4 , Divide this curve segment into two parts in the ratio 1:2 and find control points for the left and the right Bezier curve. (5)
- (b) What is morphing? Show how can a triangle in keyframe 1 can be morphed into a quadrilateral in keyframe 2. (5)
11. (a) Differentiate between phong shading and gouraud shading. (5)
- (b) What is a polygon mesh? Illustrate any two polygon mesh representations with their advantages and disadvantages. (5)