**Assignment 4**

1. What do you mean by a window to viewport transformation? Explain the required steps along with the transformation matrix.
2. What do you mean by a Homogeneous Coordinate Transformation? Explain about 3D rotation in transformation.
3. How can you perform a scaling about a fixed point? Derive the transformation matrix.
4. Given a window bordered by (20, 40) at the lower left and (80, 80) at the upper right. Similarly, a viewport bordered by (30, 40) at the lower left and (60, 60) at the upper right. If a window at position (30, 80) is mapped into the viewport. What will be the position of viewport to maintain same relative placement as in window?
5. Define scaling transformation. Prove that two successive scaling are multiplicative.
6. Reflect a prism A(0,0,0), B(1,1,0), C(1,2,2) and (0,2,0) about yz-plane which has been rotated previously with +90 degree about y-axis.
7. Why filling algorithm is required in computer graphics? Explain about flood fill and boundary fill (polygon fill) algorithm.
8. Explain Sutherland Hodgeman Polygon Clipping algorithm and trace it to clip a polygon with end points P(10,30),Q(25,35),R(35,50), U(40,15)against a window whose lower left corner is at (15,25) and upper right corner is at (50,40).
9. Explain about Cohen Sutherland line clipping Algorithm. A clipping window is specified

as A(0,0),B(40,0),C(0,40),D(0,40).We want to clip two lines P(-20,70) to Q(20,30) and R(50,10) to S(70,70) against this window.

1. How can you clip a line using Liang Barsky line clipping algorithm.Use the same algorithm clip a line with end points (10,10) and (60,30) in a window with lower left corner (15,15) and upper right corner (25,25).