INFORMATION TECHNOLOGY
ASSIGNMENT COMPUTER GRAPHICS
5TH SEM DIV-A,B

1. Explain scaling in 2D Transformations
2. Explain Scanline polygon fill algorithm in detail.
3. What is 2D shear transformation? Covert the unit square to shifted parallelogram using x-direction shear transformation operation where parameter shx = ½ and Yref= -1 and unit square dimensions are (0, 0), (1, 0), (0, 1) and (1, 1).
4. Explain non zero winding rule.
5. Explain reflection with respect to any plane in 3D transformations.
6. Write Nicholl-Lee-Nicholl line clipping algorithm. How NLN line clipping algorithm reduce the computation of unnecessary intersection point.
7. c lip the line PQ having coordinates A(4,1) and B(6,4) against the clip window having vertices A(3,2) , B(7,2) , C(7,6) and D(3,6) using Cohen Sutherland line clipping algorithm. Mention the limitations of algorithm. How it can be overcome?
8. Briefly Explain RGB color model.
9. What is depth buffer method? Write and explain the steps of a depth buffer algorithm.
10. Briefly explain Z-buffer visible surface determination algorithm.
11. Explain following color model:
12. XYZ color model.
13. CMY Color model.
14. Derive 2 X 2 transformation matrix for each of the following.
    (a) Rotation about origin. (b) Fixed point scaling.
15. Clip the line using Liang Barsky algorithm against window with (xw$_{min}$, yw$_{min}$)= (0,0) and (xw$_{max}$, yw$_{max}$)=(100,50). Line end points are A(10, 10) and B(110, 40).
16. A triangle is defined by P(2, 2), Q(4, 2) and R(5, 5). Find the transformed coordinates after 90 degree clockwise rotation followed by reflection about line y = -x.
17. Explain Cohen Sutherland line clipping algorithm with example.
18. Explain parallel and perspective projections.
19. What is window and view-port? Retrieve equation for the scaling factor to map the window to view-port in 2D viewing system.
20. Derive 3D Rotation matrix.
21. Explain CIE diagram with its usefulness.
22. Define: Dominant frequency, Saturation, Luminance
23. Explain various light sources.
24. Perform X-shear & Y-shear on a triangle having A(2,1), B(4,3),C (2,3).Consider the constant value b = c = 2
25. Classify the visible surface detection algorithms. Explain Z buffer algorithm for hidden surface removal.

26. A polygon has 4 vertices located at A(20,10) B(60,10) C(60,30) D(20,30).Calculate the vertices after applying a transformation matrix to double the size of polygon with point A located on the same place.
27. What is scaling transformation? Prove that two scaling transformation commute that is S$_1$S$_2$ = S$_2$S$_1$.