Course Title : Computer Graphics

Course No. : BIT 304

Semester : 5th

Unit-1

1. What is a computer graphics? Explain in detail about the application of computer graphics.
2. What is a random scan display system? Draw its block diagram and explain it in detail.
3. Explain the random scan display system with its advantages and disadvantages.
4. What is raster scan display system? Explain with its architecture.
5. Differentiate between Raster and Vector graphics method.

Unit-2

6. What is a digital differential analyzer (DDA)? How can you draw the line using this algorithm?
7. Derive the equation to draw a line using DDA algorithm when slope is greater than 1.
8. Illustrate the DDA algorithm to the line with end points (2,2) and (9,2)
9. Derive the expression for Bresenham line Drawing Application.
10. Use Bresenham's algorithm to draw a line having end points (25, 20) and (15, 10).
11. Trace the Bresenham's Line drawing algorithm for the end points (1,1) and (8,5).
12. How would you digitize a line with end points A(6,12) and B(10,5) using Bresenham's line drawing algorithm?
13. How can you draw circle? Explain with algorithm.
14. Derive the Mid-point algorithm.
15. How do you draw circle using mid-point circle algorithm? Explain with algorithm.
16. Digitize the octant of the circle with radius r = 7 and center (20,30).
17. Plot the 1st octant of a circle centered at origin having the radius 10 units.
18. Explain the working details of Mid-point circle algorithm. Trace the point along the line path having two end points (6,9) and (2,3) using Bresenham's line drawing algorithm.
19. Plot the ellipse centered at (0,0) with radius r_x = 8 and r_y = 6, using mid-point ellipse drawing algorithm.
20. Explain the scan line algorithms with example.
21. Define the following terms :
    a) Boundary Representation
22. Differentiate flood fill and boundary fill method?

Unit-3

23. Explain the 2D transformations.
24. Explain the following term with practical applications.
    a) 2D Shear
    b) 2D Rotation
    c) Translation

d) Scaling

25. What do you mean by homogeneous coordinates? Rotate a triangle A(5,6), B(6,2) and C(4,1) by 45 degree about an arbitrary pivot point (3,3).

26. After rotating a triangle with vertex A(0,0), B(1,7) and C(9,2) in 60 degree anti-clockwise about point (10,10), what will be the new vertex values.

27. How would you reflect an object about a line y=4x? Explain the steps with the matrices.

28. Reflect a line segment having end points (9,3) and (12,10) about a line Y = 7. Draw initial and final result graph as well.

29. Translate a triangle ABC with co-ordinates A(0,0), B(5,0) and C(5,5) by 2 –units in x-direction and 3 units in y-direction.

30. Find the new co-ordinate of the triangle ABC, with co-ordinates A(0,0), B(1,1)and C(5,2) afterit has been magnified to twice of its size.

31. Find the composite transformation matrix for reflection about a line y = mx+c

Unit-5

32. Explain the 3D transformations.

33. Explain the following term with practical applications.
    a) 3D Rotation
    b) Scaling
    c) Reflection
    d) Shear

34. Derive the relation for three-dimensional translation and rotation.

35. Differentiate between parallel and perspective projection.

36. Differentiate between orthographic, parallel and perspective projection.