

QUESTION BANK

1. Explain about different line drawing algorithms.
2. a) What is reflection and shear transformation? Discuss with examples.
b) Discuss about Sutherland Hodgeman polygon clipping algorithm with example.
3. a) Explain about cohen-sutherland line clipping algorithm
b) Discuss about homogenous coordinates.
4. Discuss about mid-point ellipse algorithm.
5. Derive the decision parameter used in Bresenham's line drawing algorithm
6. a) Write the general form of the matrix for rotation about a point $P(h, k)$.
b) Show that 2-D scales and rotations do not commute in general.
7. Explain the Cohen-Sutherland algorithm for finding the category of a line segment. Show clearly how each category is handled by the algorithm.
8. a) Explain the perspective projection for projecting 3D objects on a 2D view surface.
b) Describe 3D clipping
9. Using midpoint ellipse algorithm, generate points on the ellipse with center as origin, major axis 8 units and minor axis 6 units.
10. Assume the five vertices (Numerical values) of a pentagon of your choice. Develop the vertex list and the edge list for the pentagon. For any scan line intersecting some edges prepare the active edge list.
11. Determine a sequence of basic transformations that are equivalent to the y-direction shearing matrix.
12. a) Adapt the Liang-Barsky line-clipping algorithm to polygon clipping.
b) Write a note on viewing functions.
13. a) Write a routine to reflect an object about an arbitrarily selected plane
b) Write short notes on 3D clipping.
14. Explain 2- dimensional scaling and shear transformations with examples.
15. a) Given a clipping window $P(0,0), Q(340,0), R(340,340)$ and $S(0,340)$, find the visible portion of the lines $AB[(-170,595), (170,255)]$ and $CD[(425,85), (595,595)]$ against the given window, using Cohen – Sutherland algorithm
b) Write a brief note about the following:
i) View plane ii) View reference iii) View plane normal
16. a) Explain the various approaches followed in different line-clipping algorithms. [7]
b) What is the principle of Cyrus-Beck algorithm for clipping a polygon?
17. a) Differentiate between parallel and perspective projections. [7]
b) Explain in brief about 3D viewing pipeline.
18. Draw the flow chart for Bresenham's ellipse generation algorithm.
19. a) Write the general form of a scaling matrix with respect to a fixed point

- $P(h,k)$ where the scaling factors in x and y directions are a and b respectively.
- b) Show how shear transformations may be expressed in terms of rotation and scaling.
20. a) Explain the working of the Sutherland-Hodgeman algorithm for polygon clipping with the help of suitable example.
b) Compare Liang Barsky algorithm with Cohen Sutherland algorithm.
21. a) Derive the perspective projection transformation matrix.
b) Explain in brief about the working process of 3D clipping.
22. a) Show that a rotation about the origin can be done by performing three shearing Transformations
b) What is the need of homogeneous coordinates? Give the homogeneous coordinates for translation, rotation and scaling.
23. a) Explain about the midpoint sub division line clipping algorithm.
b) Derive the window to view port transformations equations by first scaling the window to the size of the view port and then translating the scaled window to the view port position.
24. a) Derive the transformation matrix for rotation about an x-axis in 3D.
b) Compare the orthographic and oblique types of parallel projections and also Explain the various clipping parameters in 3D clipping.
25. a) Find the normalization transformation N which uses the rectangle A(1,1) B(5,3)C(4,5) and D(0,3) as a window and the normalized device screen as the view port .
b) Show that a rotation about the origin can be done by performing three shearing Transformations.
26. Digitize a line from (1, 2) to (12, 18) on a raster screen using Bresenham straight line algorithm and compare it with line generated using DDA algorithm.
27. Derive the relation between the coordinates, point $P = (x, y)$ in one Cartesian system to the coordinate values (x', y') in another Cartesian system that is rotated by an angle.
28. a) Why is it preferred to take unit x increment or unit y increment corresponding to slope $m < 1$ or slope $m > 1$ in Bresenham line drawing algorithm.
b) Using midpoint circle algorithm, generate points on the circle with center (5, 5) and radius 5 units.
29. Derive the window-to-viewport transformation equations by first scaling the window to the size of the viewport and then translating the scaled window to the viewport position
- unit-III
- 30 a) Explain about color models?(RGB,CMY,YIQ,HSV,HSL)
b) Explain about Animations
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c) Explain “Functions in OpenGL” with example programs (line, triangle, square etc)

unit-IV

31 Explain about Shading Models (flat, gouraud & phong models)

32 Explain the following

a) adding textures to faces

b) rendering textures

33 Explain about “adding shadows to objects”

34 Explain “Building a Camera program”

unit-V

35 Explain about fractals (Koch curves & snowflake curves)

36 Explain about Peano curves

37 Explain about IFS (iterative function system) with example

38 Explain the following

a) Mandelbrot sets

b) Julia sets

unit-VI

39 Define Ray Tracing? Explain about intersecting rays with other output Primitives

40 Explain Adding surface Textures

41 Explain the following

a) reflections and transparency

b) Boolean functions (union, intersection and difference)