

(3 Hours)

80 Marks

N.B: (1) Question No.1 is compulsory.

- (2) Attempt any three questions from remaining questions.
- (3) Assume suitable data if required and state them clearly.
- (4) Figure to the right indicates full marks.

Q.1 Explain the following: (any four)

(20)

- a) Types of geometric model.
- b) Antialiasing.
- c) B-spline Curve.
- d) List and explain the input and output devices commonly used for general graphics applications.
- e) General applications of FEM.

Q.2

- a) Use the Bresenham's algorithm to rasterize the line from (7, 8) to (11, 16). Also plot the pixel positions. (10)
- b) What is product data exchange? Enlist different data exchange formats available and explain any one in details. (10)

Q.3

- a) Find the concatenated homogenous matrix for the following operations, performed in the following sequence: (10)
 - i. Translate through 4 and 3 units along X and Y axis.
 - ii. Change of scale 4 unit in X direction and 3 Unit in Y direction.
 - iii. Rotating about Z axis passing through the point (4, 3) by 30° in anticlockwise direction.

What would be the effect of above operation on a circle having unit radius with its center originally located at (0,0)? Sketch and explain.

- b) Write short note on windowing and clipping. Explain Cohen Sutherland algorithm for line clipping. (10)

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Q.4

- a) Explain the polygon filling using boundary fill algorithm. (10)
- b) Obtain the transformation matrix for rotation about the line joining the points (0,0,0) and (2,2,2) with the angle of rotation 45° in counterclockwise sense. (10)

Q.5

- a) Explain the circle drawing algorithm with an example. (10)
- b) Explain Detail Viewing transformation from window to view port (10)

Q.6 Explain the following: (20)

- a) Scan conversion.
- b) Color Models.
- c) Explain the steps in software.
- d) Transformation in computer graphics.