12223

3 Hours / 70 Marks   Seat No. ☐☐☐☐☐☐☐☐

Instructions :   (1)   All Questions are *compulsory.*

(2)   Illustrate your answers with neat sketches wherever necessary.

(3)   Figures to the right indicate full marks.

(4)   Assume suitable data, if necessary.

Marks

1.   Attempt any FIVE of the following :   **10**

(a)   Define Resolution and Pixel.

(b)   Explain basic graphic pipeline.

(c)   State different line drawing algorithms.

(d)   State any two polygon filling algorithm.

(e)   Define :

(i)   Scaling

(ii)   Reflection

(f)   Enlist different methods of line clipping.

(g)   Explain fractal lines.

2.   Attempt any THREE of the following :   **12**

(a)   Describe any two display devices.

(b)   Explain and write steps for DDA line drawing algorithm.

(c)   Consider the square A(2, 0), B(0, 0), C(0, 2), D(2, 2). Rotate the square ABCD by 45° anticlockwise about point D(2, 2).

(d)   State the steps in Cyrus Back line clipping algorithm.

3. **Attempt any THREE of the following :** 12
   (a) Write down procedure to fill polygon using flood fill.
   (b) Apply the shearing transformation to rectangle with A(0, 0), B(2, 0), C(2, 2), D(0, 2) as
      (i) Shear parameter value of 1.5 relative to line $y_{ref} = -1$.
      (ii) Shear parameter value of 1.5 relative to line $x_{ref} = -1$.
   (c) Write procedure for midpoint subdivision algorithm.
   (d) Explain curve generation using interpolation technique.

4. **Attempt any FOUR of the following :** 12
   (a) Explain virtual reality.
   (b) Write down the steps in Bresenham's circle drawing algorithm.
   (c) Explain :
      (i) Translation
      (ii) Rotation
   (d) Explain Sutherland – Hodgeman polygon clipping algorithm.
   (e) Explain coch curve with neat diagram.

5. **Attempt any TWO of the following :** 12
   (a) Explain following character generation methods :
      (i) stroke
      (ii) starburst
      (iii) bitmap
   (b) Define projection. Explain
      (i) Perspective projection
      (ii) Parallel projection
   (c) Explain window to-view part transformation.

6. **Attempt any TWO of the following :** 12
   (a) Write a procedure to fill polygon using seed fill algorithm.
   (b) Rotate a triangle defined by A(0, 0), B(8, 0) and C(4, 4) by 45° about origin in anticlockwise direction.
   (c) Write a program in C to generate Hilbert's curve.

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