

(3 Hours)

[Total Marks : 100]

- N.B. :** (1) Question no. 1 is **compulsory**.  
 (2) Attempt any **four** questions out of the remaining **six** questions.  
 (3) Assume suitable **data** if **necessary**.  
 (4) **Figures** to the **right** indicate **full** marks.

1. (a) Explain character generation methods. 5  
 (b) Explain inside outside test used in filling algorithm. 5  
 (c) What is antialiasing, how can it be reduced. 5  
 (d) Explain z-buffer algorithm for removing hidden surfaces. 5
  2. (a) Explain flood fill algorithm using 8-connected approach. Give its advantages and disadvantages. 10  
 (b) Derive Bresenham's line drawing algorithm. Plot a line by using Bresenham's line generation algorithm from (1,1) to (5,3). 10
  3. (a) Translate the square ABCD whose co-ordinates are A(0,0), B(3,0), C(3,3) and D(0,3) by 2 units in both directions and then scale it by 1.5 units in x-direction and 0.5 units in y-direction. 10  
 (b) List and explain operations on segments. 10
  4. (a) Find the clipping co-ordinates to clip the line segment AB against the window using cohen-sutherland line clipping algorithm. 10  
 Line - A (120, 60), B (160, 92)  
 $X_{wmin} = 100$                        $Y_{wmin} = 80$   
 $X_{wmax} = 150$                       $Y_{wmax} = 100$   
 (b) Explain Warnock's algorithm. 10
  5. (a) State important properties of Bezier curve. Compare Bezier curves and B-spline curve. 10  
 (b) Explain parallel and perspective projection? Derive the matrix for perspective projection. 10
  6. (a) Explain 3D object representation methods. 10  
 (b) Define the window, view port and derive window to viewport transformation. 10
  7. Write short note on :- (any **four**) 20
    - (a) Colour models
    - (b) Raster techniques
    - (c) Display file interpreter
    - (d) Fractals
    - (e) 3D clipping.
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