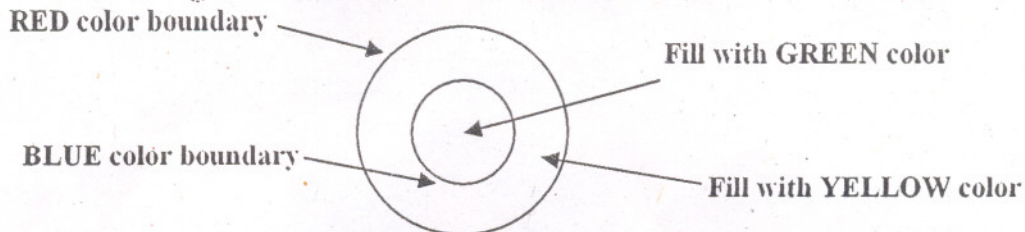


- N.B. : (1) Question No.1 is compulsory.  
 (2) Attempt any four questions from remaining six questions.

Q1.

- a. What is antialiasing and aliasing? Explain. (04)  
 b. Write a program to draw two concentric circles one with RED and other with BLUE color boundaries use a filling algorithm to fill the region between the circles with YELLOW color and use a different algorithm to fill the inner circle with GREEN color. (09)



- c. Write and explain the Depth buffer algorithm for detecting visible surfaces (07)

Q2.

- a. Find the clipping coordinates to clip the line segment AB against the window using Cohen Sutherland line clipping algorithm. (10)  
 A(120, 60), B(160, 92)  
 $X_{wmin} = 100$  ;  $Y_{wmin} = 80$  ;  
 $X_{wmax} = 150$  ;  $Y_{wmax} = 100$  ;  
 b. Explain the working of a raster scan display and random scan display and compare them. (10)

Q3.

- a. Derive the Bresenham's Line Drawing algorithm for line with slope  $< 1$  use it to digitize the line with end points  $A \equiv (40, 10)$  and  $B \equiv (50, 16)$ . Give the plot of pixels generated along the line path. (12)  
 b. Write a short note on Phong shading. What is its advantage over constant intensity shading? (08)

Q4.

- a. Derive the transformations for producing a parallel projection. When is a projection called (i) Cavalier (ii) Cabinet (iii) axonometric (iv) isometric? (12)  
 b. Explain the scan line method for removing hidden surfaces with the help of an example. Is it image space or object space method? (08)

Q5.

- a. Write a sequence of 2D transformations for the following (15)  
 (i) To reflect an object about the line  $y = mx + c$   
 (ii) To Rotate an object about a pivot point  
 (iii) To scale an object with respect to a fixed point  
 Also write the matrices at each step and final matrix.  
 b. Write a note on the input device keyboard. (05)

Q6.

- a. Write a note on the common Reflections and shearing transformations in 2 Dimensional and 3 Dimensional system. Which reflection converts coordinate specification from left handed system to a Right handed system? Write its matrix. (12)  
 b. Write the properties of Bezier curves and surfaces and B-spline curves. (08)

Q7. Write short notes on

- a. Perspective projections (05)  
 b. Homogeneous coordinate system (05)  
 c. 3D clipping (05)  
 d. Halftoning (05)