

(3 Hours)

Total Marks 80

- N.B. (1) Question 1 is compulsory
 (2) Attempt any four questions from question 2 to 7
 (3) Use of Scientific calculator is not allowed.
 (4) Use of simple calculator is allowed.
 (5) Figures to right indicate full marks.

- Q.1(a) Explain DDA Line Drawing Algorithm and Rasterize the line whose end points are A (1, 6) and B (9,12) using DDA line drawing algorithm. (10)
 (b) Explain in brief the process of Bit Plane Slicing. (5)
 (c) Explain Z Buffer algorithm for Hidden Surface Removal. (5)
- Q.2. (a) Find the transformation matrix that transform the given square ABCD to half its size with center still remaining at the same position .The coordinates of the square are A(-10,10), B(30,10) , C(30,30),D(10,30) and center at (20,20), Also find the resultant coordinates of the square. (8)
 (b) Explain with example Cohen Sutherland technique for line clipping. muadda.com (7)
- Q.3. (a)Find the clipping coordinates for line P_1P_2 where $P_1=(-1,7)$ and $P_2=(11,1)$ against window with $(X_{wmin},Y_{wmin})=(1,2)$ and $X_{wmax},Y_{wmax}=(9,8)$ using Liang Barsky algorithm. (8)
 (b) Discuss any two spatial domain filter approaches for Image enhancement. (7)
- Q.4. (a) Derive a single 4×4 matrix for the following transformation
 I. Rotate by 180 around y axis
 II. Translate by 3 units in x axis and 4 units in z axis
 III. Scale by 4 units in y axis (8)
 (b) Compare Boundary fill and Flood fill algorithm. Write a procedure to fill region bounded by different color used 4 connected approach. (7)
- Q.5 (a) Equalized the given Histogram. (8)

Gray Level	0	1	2	3	4	5	6	7
Number of Pixel	790	1023	850	656	329	245	122	81

 (b) Explain Half toning and Dithering techniques. (7)
- Q.6 (a) Construct the Bezier curve of order 3 with 4 polygon vertices A(1,1) B(2,3) C(4,3) , D(3,1) (8)
 (b) Explain with algorithm Bresenham's circle drawing algorithm. (7)
- Q.7 Write a short note on (any Three) (15)
 (a) Difference between Random Scan and Raster Scan
 (b) Inside Outside test & Winding number method
 (c) Image Digitizer
 (d) 2D rotation about arbitrary point