53 (CS 604) CPGR

2019

COMPUTER GRAPHICS

Paper : CS 604

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions.*

1. *(a)* What do you mean by image space ?

   (b) Write the rotational matrix with rotation $-30°$.

   (c) If the uniform scaling is applied on equilateral triangle, the resultant triangle become...... (equilateral, isosceles, circle, cannot predict).

   (d) Find reflection point of (5,0) with respect to line $y = x$.

Contd.

(e) Define rigid body transformation.

(f) Justify : high resolution improve image quality.

(g) What is polygon filling ?

(h) What is C° continuity ?

(i) What is pixel ?

(j) Prove that reflection of reflection is original.   10×2

2. (a) Write the DDA line drawing algorithm. What are the disadvantages of this algorithm ?

   (b) Apply Bresenham line drawing algorithm, Find the pixels of a line of end points $(1,1)$ and $(8,5)$.   10+10

3. (a) What do you mean by scaling ? Find the scale matrix with respect to the point $(1,1)$, where $s_x = 1$ and $s_y = 2$.

   (b) Consider a triangle with vertices $A(1,1)$, $B(3,1)$ and $C(2,2)$. Do scaling with $s_x = 2$, $s_y = 2$ with respect to the vertex A and find the resultant vertices.

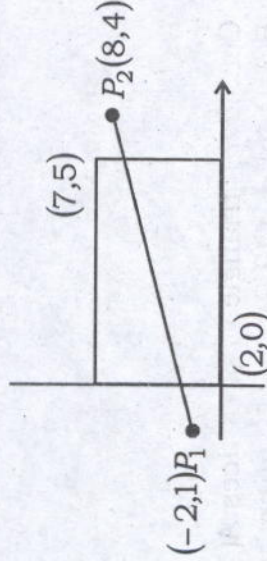(c) Write the homogeneous coordinate and its advantages.   8+7+5

4. What is reflection ? Find the reflection matrix with respect to the line $y = mx+c$. Hence find the reflection of the point $(7,3)$ with respect to the line $y = x+1$.   4+12+4

5. (a) Define window and viewport. Establish the relation between them.

   (b) Describe technique of inside outside test of a point with respect to a polygon by the odd even test.   12+8

6. (a) Explain the Cohen-Sutherland clipping algorithm.

   (b) Using Cyrus-Beck algorithm clip the line P_1P_2 in the following diagram :

   (c) Explain the Cubic Bezier curve.   5+7+8

7. Write the notes on : 4×5

    (a) Boundary Filling Algorithm

    (b) Z-buffer Algorithm.

    (c) Projection

    (d) Computer animation.