53 (CS 604) CPGR

2018

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. Describe the Bresenham line drawing algorithm. Using this algorithm find the pixels between the points (1, 1) and (10, 6). Compare this algorithm with respect to the DDA algorithm. 8+8+4=20

2. *(a)* What do you mean by rotation? Find the rotational matrix $R(\theta)$, [θ is the angle of rotation in anti-clockwise direction]. Hence, find the co-ordinate of the point (5, 0) after rotation, when $\theta = 45°$.

(b) Describe reflection. Find the reflection matrix with respect to the line $y = x+1$.
10+10=20

3. (a) Explain the mid-point circle drawing algorithm. Using this algorithm, find the pixels of a circle whose centre at origin and radius is 12.

(b) What is scaling and uniform scaling? Given an arbitrary rectangle, find the scaling factor which changes the area of the rectangle double the earlier.
12+8=20

4. (a) Describe an inside-outside test of a point with respect to a polygon. What is winding number?

(b) What do you mean by boundary filling? Describe a boundary filling algorithm and state its advantages and disadvantages. 8+12=20

5. (a) Describe the Cohen-Sutherland line clipping algorithm. Describe its advantages and disadvantages. Why do we not use algebraic methods for line clipping?

(b) Describe and formulate the viewing transformation in two-dimension.
12+8=20

6. What is Interpolation curve? Describe Hermit cubic curve and obtain its blending function and give the graphical representation. 20

7. Write short notes on : ***(any four)***
5×4=20

(a) Projection

(b) Computer Animation

(c) Convex Polygon

(d) Different types of continuity

(e) Parametric representation of an equation.
