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. Describe the Bresenham line drawing algorithm. Using this algorithm, find the pixels between the points (3,2) and (12,5). Write the advantages and disadvantages of the algorithm. 8+8+4

2. *(a)* Formulate the rotational matrix $R(\theta)$ [θ is the rotational angle in anti-clockwise direction]. Hence find the coordinate of the point (5, 0) after rotation, where $\theta = -30°$.

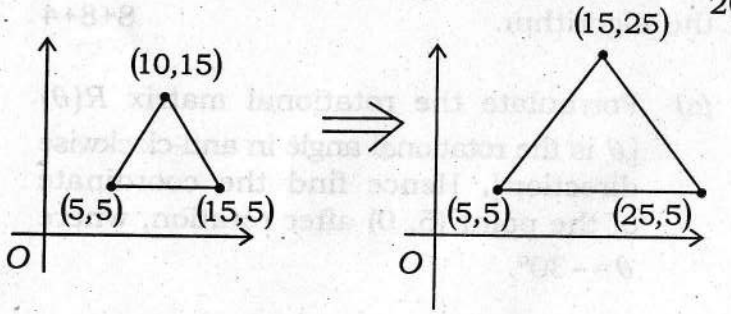
Contd.

(b) Define the translation and its use in computer graphics. 15+5

3. (a) Describe the midpoint circle drawing algorithm. Using this algorithm, find the pixels of a circle whose centre at origin and diameter is 20.

(b) What is scaling ? What is the condition of uniform scaling ? If you apply a uniform scaling on a point (6,6) [with scaling factor 1·5], what will be the new point ? 12+8

4. From the following diagram, it shows that the triangle changes after transformation. Describe the transformation and derive the transformation matrix from the diagram. 20



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

(b) Describe a boundary filling technique and its advantages and disadvantages. 10+10

6. What is tangent continuity ? Describe Hermite cubic curve and obtain its blending function and give the graphical representation. 5+15

7. Write short notes on : 5×4

(a) Inside-outside test

(b) Perspective projection

(c) RGB colour model

(d) Cohen-Sutherland clipping algorithm.
