MCA/M-21   **24546**
COMPUTER GRAPHICS
Paper–MCA-14-44

Time Allowed : 3 Hours]   [Maximum Marks : 80

Note : Attempt **five** questions in all, selecting **one** question from each Unit. Question No. **1** is compulsory. All questions carry equal marks.

Compulsory Question

1. Answer any **four** of the following questions in brief :

   (a) Describe any two coordinate representations used in Graphics.

   (b) What will be the x and y increments for a line with Endpoints (4, 6) and (8, 14), to be drawn using symmetrical DDA algorithm ?

   (c) What will be the position of a point (6, 8), if it is x-sheared by a factor of 4? Use the matrix representation for the computation.

   (d) What is Oblique parallel projection ? How will the screen coordinates of a point be obtained using this projection when the point is defined in Eye coordinate system ?

   (e) What is the significance of Fractal geometry in 3-D graphics ?

UNIT–I

2. Give an introduction to Computer graphics and its applications along with a specification of the role of Inputs devices in Graphics applications.

3. Distinguish between 'Resolution' and 'Aspect ratio' and describe, how they are related to a Display device. Also give a brief overview of any one commonly used display device with a description of how it supports Colored images.

UNIT–II

4. Compute the points to rasterize the following using Bresenham's algorithm :

   (a) Line with endpoints (7, 9) and (14, 12).

   (b) Circle with centre (0, 0) and Radius 4.

5. Describe the procedure/algorithm required for the following :

   (a)   Drawing of Bezier curves.

   (b)   Polygon filling based on Scan-line fill method.

UNIT–III

6. Bring out the similarity between the following using suitable examples/ illustrations :

   (a)   Dragging and Translation.

   (b)   Zooming and Scaling.

7. Describe one algorithm of clipping lines that is based on Parametric representation of line equation. Illustrate using a suitable example, how the intersection point of a line will be computed using this algorithm, if it is intersecting the top edge of the Viewpoint.

UNIT–IV

8. Describe any one method of modeling 3-D objects. Also describe, how object visibility is determined using Binary Space Partitioning (BSP) tree method.

9. What is the advantage of using Interpolation in Tweening and Shading ? Give a description of how interpolation is used in both.