

Roll No. ....

Total Pages : 03

MCA/M-24

**24528**

COMPUTER GRAPHICS AND ANIMATION

MCA-20-42

Time : Three Hours]

[Maximum Marks : 75

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

1. Attempt any *five* of the following :
  - (a) Define Clipping and Clip window.
  - (b) How is a parametric curve defined and represented mathematically ?
  - (c) Differentiate between Raster and Vector Graphics.
  - (d) Write a note on Zooming.
  - (e) Write various area filling techniques
  - (f) List any *four* areas of applications of computer graphics.

### Unit I

2. What are the distinguishing characteristics between Raster scan and Random scan display devices in computer graphics ? Explore the feasibility of using frame buffers to control picture color and intensity, supporting your response with appropriate arguments.

3. What is the concept of Color CRTs ? How does the focusing of colors occur within colored CRTs ? Furthermore, why is refreshing necessary in CRT technology ? Provide a comprehensive explanation.

### **Unit II**

4. Write Bresenham's line generation algorithm. Compare the Bresenham line generation algorithm with the DDA algorithm. How Bresenham line generation algorithm overcomes the limitations of DDA algorithm ? Use Bresenham line generation algorithm to draw a line segment from (15, 5) to (20, 9).
5. Explain the following with suitable example :
- (a) Flood Fill Algorithm
  - (b) Boundary fill Algorithm.

### **Unit III**

6. How are two-dimensional transformations represented using matrices ? Discuss the matrix representations for translation, rotation, scaling, shearing, and reflections. Explain how these matrices are applied to transform the coordinates of objects in computer graphics.

7. Explain the following :
- (a) Sutherland-Hodgeman Polygon Clipping Algorithm
  - (b) Weiler-Atherton Polygon Clipping.

### **Unit IV**

8. What is the Z-buffer algorithm used for solving the hidden surfaces problem in computer graphics ? When two polygons possess identical z values and the Z-buffer algorithm is implemented, what outcome can be observed ?
9. How does the BSP-Tree Method contribute to visual surface determination through area subdivision ? Discuss subdivision algorithm in detail and how its exploit are coherence.