Roll No. ..... Total Pages : 3

MCA/DX **5560**

COMPUTER GRAPHICS

Paper : MCA–501

Time : Three Hours] [Maximum Marks : 80

Note : Attempt *five* questions in all. Question No. 1 is compulsory. Attempt *four* more questions selecting *one* question from each unit.

(Compulsory Question)

1. Answer the following questions in brief :

(a) Distinguish between Raster scan and Random scan displays.

(b) What will be the size of frame buffer in bits if the resolution of the monitor is 1024 × 1024 and the number of shades representing each pixel is 256 ?

(c) Write the algorithm for drawing a circle using Bresenham's method.

(d) What is the importance of coordinate systems in graphics ?

(e) Illustrate the effect of zooming a window using a suitable example.

(f) Distinguish between Rubber band technique and Dragging.

(g) Write down the 3-D transformation matrices for rotation about the three axes.

(h) How is Linear interpolation used in tweening ?

8×3=24

UNIT–I

2. What is the function of a frame buffer and a display processor in an interactive graphics system ? How is a picture created and manipulated using interactive techniques ? 14

3. Describe the following in brief :
   (a) Resolution.
   (b) Look-up table.
   (c) Image scanner.
   (d) Plasma panel. 14

UNIT–II

4. Explain the steps that are required to scan-convert a line using Bresenham's algorithm. Is Bresenham's algorithm better than DDA line drawing algorithm ? Obtain the points on a line with end points (2, 6) and (10, 8) using Bresenham's algorithm. 14

5. (a) How is a circle drawn using polar coordinates ?
   (b) Show how an object can be filled using scan-line seed fill algorithm. 2×7=14

UNIT–III

6. A triangle has vertices located at A(4, 6), B(10, 7), C(7, 12). Indicate a transformation matrix to increase the size of the triangle two times with point A located at the same place. Thus, obtain the points of the scaled triangle. 14

7. (a) Illustrate the logic of Liang-Barsky line clipping algorithm using a suitable example.
   (b) Describe the 2-D viewing transformation that maps a circular window in world coordinates onto a normalized circular view-port using an appropriate example. 2×7=14

UNIT–IV

8. (a) Describe how a 3-D object is modelled before it is transformed into eye-coordinate system.
   (b) Define the equations for interpolating light intensities at various points on an object using Gouraud shading. 2×7=14

9. (a) Distinguish between Oblique, Parallel and Perspective projection.
   (b) How are depth values used to identify hidden surfaces in depth buffer algorithm ? 2×7=14
