

Roll No.....

Total Pages: 3
10014

MCA/M-17
COMPUTER GRAPHICS
Paper: MCA-14-44

Time: Three Hours

Maximum Marks: 80

Note: Attempt five questions including No. 1 which is compulsory. All questions carry equal marks.

Compulsory Question

1. Answer the following questions in brief :
 - (a) How many bits will be used to represent a pixel in the frame buffer if 512 colors are to be represented for the pixel?
 - (b) Describe the light polarization phenomena as used in LCD display.
 - (c) What will be the x-increment for a line between (4, 7) and (8, 15) when simple DDA line drawing algorithm is used.
 - (d) What is the parametric representation of cubic curves?
 - (e) Define window and viewport.
 - (f) Derive the rotation transformation for rotating a point w.r.t. the origin.
 - (g) How will a point be interpolated for light intensities using Goraud shading?
 - (h) Write down the general form of equations for obtaining the tweened coordinates between two key frames in animation.

Unit-I

2. How are pictures created and manipulated? Describe all the coordinate systems used in graphics for creation and manipulation of pictures. Also mention the type of functionality for which that coordinates system is used.
3. (a) Describe the anatomy and working of any two input devices along with the kind of applications for which they may be used.

(b) What is the advantage of using lookup tables and display processor in graphics?

Unit-II

4. (a) How can a circle be drawn using a coordinate system other than Cartesian coordinates?
(b) Derive the Bresenham's algorithm for drawing lines.

5. How are objects filled using stack based seed fill and scan line seed fill algorithms.

Unit-III

6. Show that effect of scaling a triangle with vertices A(2,3), B(8,4), C(5,7) to twice its size and keeping the center of the triangle fixed. What will be the mirror reflection of the vertex C w.r.t. the line $y=4$.
7. Describe, how a point on a line is described using parametric, equations. Use these equations to describe how a line will be clipped as per Liang-Barsky line clipping algorithm. Use this algorithm to clip a line with end points A(5,6) and B(9,10) against a viewport with $x_{\min} = 2$, $x_{\max} = 10$, $y_{\min} = 3$ and $y_{\max} = 9$.

Unit-IV

8. What is the difference between oblique parallel projection and perspective projection? How is an object modeled before projection?
9. How are depth comparisons made for identifying hidden surfaces in Depth buffer, Ray casting and Depth sort algorithms?