Roll No. ..... Total Pages : 03

MCA/M-19 10514

COMPUTER GRAPHICS

MCA-14-44

Time : Three Hours] [Maximum Marks : 80

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

(Compulsory Question)

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

(i) Describe any *two* applications of graphics which you commonly use.

(ii) What is the need of interlacing in a CRT monitor ?

(iii) Name any *two* widely used graphics softwares.

(iv) What will be the x-increment for a line to be draw from (5, 7) to (14, 10) using Bresenham's method ?

(v) How is a point on an ellipse represented using polar coordinates ?

(vi) Which transformation is used in dragging ?

(vii) What is the role of parameter u in Liang-Barsky line clipping algorithm ?

(viii) What is x-minmax test as used in hidden surface elimination methods ?

(ix) What data structures are used to model a 3-D object using Boundary-representation ?

Unit I

2. What is the importance of using coordinate systems in creating pictures in graphics ? How are pictures created and manipulated ?

3. Highlight the importance of the following in graphics :
   (a) Look up table
   (b) Image scanner
   (c) Shadow mask CRT.

Unit II

4. Describe the symmetrical DDA algorithms for drawing lines and circles and derive the similarity in procedure of both. Also identify the limitation of symmetrical DDA circle drawing algorithm.

5. (a) Describe the procedure and mathematical functions used to draw Bezier curves.
   (b) What procedure is followed for filling a polygon using Boundary fill algorithm ?

Unit III

6. Describe the following transformations along with their homogeneous representations :
   (a) Scaling with respect to a fixed point
   (b) 2-D viewing transformation.

7. Bring out a distinction between Sutherland-Hodgman polygon clipping and Weiler-Atherton polygon clipping algorithms by describing the clipping procedure followed in each.

Unit IV

8. (a) How is 3-D modelling done using Fractal geometry ?
   (b) How is a point in screen coordinate system obtained using perspective projection ?

9. How is light intensity modeled for a point using Phong illumination Model ? Describe, how interpolation is used in Gouraud Shading and Phong Shading.