M.Sc. CS (SW)-II / MCA-II

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

MMCS/M-19 10578

COMPUTER GRAPHICS

CS-DE-21

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 the following questions in brief :

(i) If you have monitor with a resolution of 640 × 480 pixels then what will be the aspect ratio ?

(ii) How is polarization of light used in liquid crystal displays to display a picture ?

(iii) What do you mean by the term 'output primitives' ? Name the Commonly used 2-D geometric primitives.

(iv) How will you draw a bar chart using line drawing ?

(v) Derive the composite matrix for translation followed by scalling.

(vi) Distinguish between a window and a viewport.

(vii) What do you mean by Graphical User Interface (GUI) ?

(viii) What is BSP tree and what is its purpose of graphics ?

Unit I

2. (a) What is Computer Graphics ? How is the end product of a graphics application obtained ?

   (b) Explain the working of a CRT display. Why is a refresh process required in CRT ?

3. (a) Describe the various coordinate systems used in graphics along with the purpose for which they are used.

   (b) Describe any *two* pointing devices along with their features, working, advantages and disadvantages.

Unit II

4. Derive the Bresenham's line drawing and write a pseudo-code for the same. Rasterize a line between the endpoints (4, 6) and (12, 10) using Bresenham's algorithm.

5. (a) How are Bezier curves drawn ? Why are they called parametric curves ?

   (b) How is a circle drawn using polar coordinates ?

Unit III

6. (a) Derive the general form of the matrix for rotation about an arbitrary point.

   (b) Scale a rectangle with vertices A(4, 4), B(10, 4), C(4, 8) and C(10, 8) to twice its size keeping its centre fixed.

7. Compare mid-point subdivision line clipping algorithm with Cohen Sutherland line clipping.

Unit IV

8. What are the advantages of scan line fill algorithm over basic seed fill algorithm ? Describe the working of scan line filling algorithm using suitable examples.

9. (a) What are the various representation schemes for solid objects based on Euclidean Geometry ? Give a brief overview of any *two*.

   (b) Bring out the distinction between Phong shading and Gouraud shading.