MCA-II / M.Sc. C.S (SW)-II

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

DMCA/M-15 **10325**

COMPUTER GRAPHICS

Paper–CS-DE-21

Time Allowed : 3 Hours] [Maximum Marks : 80

Note : Attempt **five** questions in all, selecting at least **one** question from each Unit. Question No. **1** is compulsory. All questions carry equal marks.

Compulsory Question

1. Answer the following questions in brief : 8×2=16

   (a) What is a Pixel?

   (b) Explain any one application area of Computer graphics.

   (c) Write the equation for calculating the frame-buffer bit address for pixel position (x, y) when 1 bit is used to represent 1 pixel.

   (d) What is a Bar chart?

   (e) Distinguish between a Window and a Viewport.

   (f) Represent the rotation transformation, w.r.t. the origin, using a matrix.

   (g) What do you mean by Graphical user interface?

   (h) What is Parallel projection?

UNIT–I

2. (a) How are pictures created in a Raster Scan System? 8

   (b) Describe any two coordinate systems used in graphics. 8

3. (a) Which hard copy devices may be used to obtain the output of graphics applications? 8

   (b) Describe any two Input devices you commonly use for graphics applications. 8

UNIT–II

4. Indicate which raster locations would be chosen by Bresenham's algorithm when scan converting a line from pixel coordinate (1, 1) to pixel coordinate (8, 5). 16

5. Describe the various methods to draw a circle. Which of these methods use Cartesian coordinates for drawing the circle? 16

UNIT–III

6. Derive the effect of the following transformations on a square with diagonal vertices at (2, 2) and (6, 6) :

   (a) Translation with $T_x = 3$ and $T_y = 4$.

   (b) Scaling with scaling factor 2 w.r.t. the origin.

   (c) Shearing with x-shearing factor as 2. 16

7. How is a line represented using parametric equations? Describe the Liang-Barsky algorithm for clipping lines using the parametric representation. 16

UNIT–IV

8. (a) Summarize any three techniques that are incorporated into graphics packages to aid the interactive construction of pictures. 8

   (b) What is Tweening? How is it done? 8

9. How are 3-D objects modeled? Illustrate using a suitable example. 16