

MCA-3rd
Computer Graphics and Multimedia

Full Marks : 70

Time : 3 hours

Answer any six questions including Q. No. 1
which is compulsory

The figures in the right-hand margin indicate marks

1. Answer the following questions : 2 × 10

- (a) What do you mean by emissive and non-emissive displays ?
- (b) What are the importances of homogeneous co-ordinate system in computer graphics ?
- (c) Find refresh rate of 512×512 frame buffer, if the access time for each pixel is 200 nanoseconds (ns).
- (d) What is morphing ? Where it can be applied ?

(e) Explain the properties of B spline. How it is differ from Bezier ?

(f) What is meant by virtual reality ?

(g) Define dithering.

(h) Compare perspective with parallel projection.

(i) What are various text clipping technique ?

(j) Give a transformation matrix to produce an X-direction shear relative to X-axis.

2. (a) Compare the computation done in Digital Differential Analyser (DDA) algorithm with Bresenham's line drawing algorithm. 5

(b) Write a boundary fill procedure to fill an 8-connected region. 5

3. (a) Given control points (10, 100), (50, 100), (70, 120) and (100, 150). Calculate coordinates of any four points lying on the corresponding Bezier curve. 5

- (b) Derive the transformation matrix for window to viewport mapping transformation. 5
4. Write short notes on :
- (i) MIDI Vs. Digital Audio 5
- (ii) Hypermedia Vs. Hypertext. 5
5. (a) Obtain the perspective projection of a line segment $AB = \{(3, 2, 4), (3, 2, 8)\}$ which is parallel to z -axis onto the $z = 0$ plane with the COP at $(0, 0, -2)$. Also find the vanishing point. <http://www.odishastudy.com> 5
- (b) Prove that 2D rotation and scaling commute. If $S_x = S_y$ or if $\theta = n\pi$ for integer n . 5
6. (a) Discuss the production rule of a grammar-based modeling procedure that influences the final shape of the models. 5
- (b) Explain Cohen-Sutherland line clipping algorithm. 5

7. (a) What is clipping in the context of open GL and where does it fit in the steps of the open GL pipeline architecture? 5
- (b) Why is a fourth component w added to the usual three dimensional coordinate in computer graphics systems like open GL? Give two common uses of the extra entries in the corresponding 4×4 matrices. 5
8. (a) Name the major component of a graphical interface and what are its features? 5
- (b) What are the difference between VGA and SVGA resolution? 5