NEW

2016

BCA

6th Semester Examination

COMPUTER GRAPHICS & MULTIMEDIA

PAPER—3203

Full Marks : 100

Time : 3 Hours

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

Answer Q. No. 1 and any *four* from the rest.

1. Answer any *five* questions :   5×2

   (a) What do you mean by emissive and non-emissive displays ?

   (b) What is persistence ?

(c) What is run length encoding ?

(d) What do you mean by Shearing ?

(e) Define resolution of screen.

(f) What is Dot pitch ?

(g) What is clipping ?

2. (a) With a precise narrative description, write down the algorithm for generating a circle using Bresenham's algorithm. 8

(b) Also find out (using Bresenham's algorithm) the pixel location approximating the first octant of a circle having centre at (4, 5) and radius 4. 7

3. (a) Write down the Cohen-Sutherland line clipping algorithm. Why mid point subdivision algorithm is preferred over Cohen-Sutherland algorithm for line clipping ? 6+2

(b) Derive World Co-ordinate system and viewing Co-ordinate system. Derive the transformation matrix for window to viewport transformation. 2+5

(Continued)

4. (a) What are the differences between window and viewport ? Write down a matrix to shear in x and y direction in two dimensions. 3+5

(b) Scale the square ABCD, A(0, 0), B(4, 0), C(4, 4), D(0, 4) two units in x-direction, and two units in y-direction with respect to origin. 4

(c) What is the difference between interactive and non-interactive Computer graphics ? 3

5. (a) What is reflection ? Write down a matrix to reflect a point (x, y) about the straight line y = x. 2+3

(b) Define homogeneous co-ordinates. 4

(c) A triangle is defined by $\begin{pmatrix} 6 & 4 & 9 \\ 8 & 1 & 3 \end{pmatrix}$. Find the transform

co-ordinates after the following transformation :

(i) 90° rotation about origin ;

(ii) Reflection about x-axis. 3+3

(Turn Over)

6. (a) Discuss how computer aided music can be synthesized using MIDI. 5

   (b) What do you mean by I-frame, B-frame and P-frame in the context of video compression ? Write down the basic steps of MPEG video compression. 3+7

7. Write short notes on (any *five*) : 5×3

   (i) Sampling and Quantization ;

   (ii) Image and Sound formats ;

   (iii) Human perception model ;

   (iv) Projections ;

   (v) Half toning ;

   (vi) Digitizer.

[*Internal Assessment : 30*]

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