# 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

**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

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* ]**