B. Tech

BCSE 3401

Seventh Semester Examination – 2007

COMPUTER GRAPHICS AND MULTIMEDIA

Full Marks – 70

Time – 3 Hours

*Answer Question No. **1** which is compulsory and any **five** from the rest.*

The figures in the right-hand margin indicate marks.

1. Answer the following questions : 2×10

   (a) What is the storage requirement for a 1024 × 1280 × 24 resolution picture for a 30 second animated film sequence at video rates of 30 frames per seconds ?

   (b) Explain briefly the impact of persistence of phosphor on graphics animation.

(c) List down the characteristics of line drawing algorithm.

(d) Give two differences between Flood-fill and Boundary-fill algorithms.

(e) Convert these homogeneous pints to Cartisian : (0,1,2,3), (1,2,3,4), (2,3,4,5).

(f) What are the advantages and disadvantages of command line and graphical user interface ?

(g) What is a projector in the context of viewing ?

(h) Give at least one example for each of the following : line drawing and raster display devices.

(i) What is the backward mapping problem in texture mapping ?

(j) What is a Lambertian surface ?

2. (a) What do you understand by interactive computer graphics (ICG) ? Explain some of the graphical devices that support ICG. 4

(b) Explain the difference between image processing and computer graphics. 3

(c) Discuss the advantages and disadvantages of using command line and graphical user interface. Give example of operating systems that support above user interfaces. 3

3. (a) What steps are required to plot a line whose slope is between 45° and 90° using Bresenham's method? 5

(b) How do you setup the decision parameter for drawing a circle ? Derive. 5

4. (a) What are the 3 basic elements of viewing ? What is a projector, in the context of viewing ? Explain. 5

(b) How is the Z buffer used to make closer objects display in front of farther ones ? 5

5. (a) What is clipping ? Write the Cohen-Sutherland line clipping algorithm. 5

(b) Let R be the rectangular window whose lower left-hand corner is at L(−3,1) and upper right-hand corner is at R(2,6). Find

the end-point codes for the following line segments using cohen-sutherland line clipping algorithm. 5

6. (a) Distinguish between parallel and perspective projections. 2

(b) How does the scan-line method determine which surfaces are hidden ? How does edge coherence and area coherence help to reduce computational effort ? 4

(c) Write depth buffer algorithm for hidden surface removal. 4

7. (a) Write some of the important properties of Bezier curve. 3

(b) Draw the Bezier curve using a set of control points (0,1), (2,5), (5,5) and (8,0). 4

(c) Test the local and global control property over this curve. 3

8. Explain the followings : 2.5×2

(a) Transformations

(b) Rasterization

(c) Scan-Conversion

(d) Image space algorithms.
