

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
- 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 ?
 - Explain briefly the impact of persistence of phosphor on graphics animation.

P.T.O.

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

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

(e) Convert these homogeneous points to Cartesian : (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 : 2.5x2

(a) Transformations

(b) Rasterization

(c) Scan-Conversion

(d) Image space algorithms.

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