Fourth Semester Examination – 2008

COMPUTER GRAPHICS

Full Marks – 70

Time : 3 Hours

Answer Question No. 1 which is compulsory

and any five from the rest.

Figures in the right hand margin

indicate marks.

1. Answer the following questions :   2×10

   (a) What is the difference between rasterization and scan conversion ?

   (b) Write the use of error term in Bresenhams line drawing algorithm.

   (c) What are the disadvantages of seed fill algorithms ?

   (d) Differentiate between parallel and perspective projections.

   (e) Write down the role of scan conversion in seed fill algorithms.

   (f) Justify the use of special purpose of graphics processors.

   (g) Differentiate between windows and viewports.

   (h) What do you understand by the resolution of the CRT ?

   (i) How does the refreshing rate affects the interlace and non-interlace displays ?

   (j) List down the advantages of user interface over command-line interface.

2. (a) Explain the storage tube graphics display mechanism with its advantages and disadvantages.   4

   (b) What is the frame buffer ? How can the intensity levels of pixels be increased using look-up table ? Illustrate your answer taking an n-bit plane with a w-bit wide look-up table.   3+3

3. (a) Discuss the Bresenham's integer line generation algorithm. 5

(b) Explain how it works on the points (5,5) to (10,7) ? 5

4. (a) What is clipping ? Explain Cohen-Sutherland clipping algorithm with an example. 5

(b) Given a window A(20,20), B(60,40), C(60,40), D(20,40). Use Cohen Sutherland algorithm to find the visible portion of the line P(40,80) - Q(120,30) inside the window ? 5

5. (a) What are the ground rules for graphics software design ? What are the common graphic primitives, windowing functions and utility functions in a graphics package ? 5

(b) Develop the formulae to compute the address of raster in frame buffer displays. 5

6. (a) Perform a 45° rotation of a triangle A(0,0), B(1,1), C(5,2) 2

(i) about the origin

(ii) about P(–1,–1)

(b) Magnify the triangle with vertices A(0,0), B(1,1), C(5,2) to twice its size while keeping C(5,2) fixed. 4+4

7. (a) What are Gourad and Phong Shading ? 5

(b) Explain Warnocks algorithm for hidden surface removal. 5

8. (a) Write some important properties for designing curves ? 3

(b) What is Bezier curve ? State some important properties of Bezier Curve. 3

(c) Write the Bezier equation and draw the Bezier curve using a set of control points (1,5), (2,2), (5,2), (7,5) and (9,2). Test the order of continuity by the above curve. 4

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