00307

Printed Pages – 3 CS – 507

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 1008 Roll No. | | | | | | | | | | |

B.Tech.

FIFTH SEMESTER EXAMINATION, 2005-2006

COMPUTER GRAPHICS

Time : 2 Hours *Total Marks : 50*

Note : *(i) Attempt **all four** questions.*

(ii) Make suitable assumption for missing data, if any and state assumption mode.

(iii) Be precise in your answer.

1. Attempt ***any four*** of the following : **(3x4=12)**

(a) The VGA Card of IBMPC provides resolution of 640×480 pixels in color mode. Determine the buffer memory requirements for this card with 256 color.

(b) Define scan conversion using interlacing technique. Calculate time available to access and display each pixel for a video system with 525 scan line and each scan line contain 525 pixels.

(c) Derive Bresenham's line drawing algorithm and extend it for all quadrants.

(d) Differentiate between Raster and Vector Graphics.

(e) Write a procedure for filling the interior of any specified set of "polygon" vertices using the non zero winding number rule to identify interior region.

(f) Explain seed fill algorithm.

2. Attempt *any four* of the following : **(3x4=12)**

(a) Show that transformation matrix for a reflection about $y = -x$ is equivalent to a reflection relative to the y axis followed by a counter clockwise rotation by 90°.

(b) A mirror is placed vertically such that it passes through the points (10, 0) and (0,10). Find the reflected view of a triangle ABC with coordinates A (5, 50), B (20, 40), C (10, 70).

(c) Find the transformation matrix that transform the given square ABCD to half its size with centre still remaining at the same position. The coordinates of the square are A (1, 1), B (3, 1), C (3, 3), D (1, 3) and centre at (2, 2).

(d) Use the Cohen Sutherland algorithm to clip line P_1 (70, 20) and P_2 (100, 10) against a window lower left hand corner (50, 10) and upper right hand corner (80, 40).

(e) Find the normalization transformation window to viewport with window, lower left hand corner is at (1, 1) and upper right corner at (3, 5) onto viewport having lower left corner at (0, 0) and upper right hand corner at (0.5, 0.5).

(f) Develop a text clipping algorithm that clip individual characters assuming that the characters are defined in a pixel grid of a specified size.

Attempt *any two* of the following : **(7x2=14)**

(a) What is display file ? Explain display file structure and discuss the various types of data structure used for display files.

(b) A tetrahedron is defined by O (0, 0, 0), A (2, 0, 0), B (0, 2, 0) and C (0, 0, 2). Find the final coordinates of it when it is rotated by an angle of 30° with respect to a axis N = I + J + K passing through origin O.

(c) What do you understand by perspective projection. What is the difference between centre of projection and vanishing point explain it.

Attempt *any two* of the following : **(6x2=12)**

(a) Explain scan line algorithm for hidden surface removal.

(b) Discuss the properties of Bezier and Bspline curves.

(c) Determine five points on a Bezier curve for the ϕ vertices B_0 (1, 1), B_1 (2, 3), B_2 (4, 3) and B_3 (3, 1).

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