

Exam.Code:0917

Sub. Code: 6787

1128

B.E. (Computer Science and Engineering)

Fifth Semester

CS-502: Computer Graphics

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit.

x-x-x

I. Write short answers of the following:-

- a) Differentiate between raster-scan systems and random-scan systems.
- b) What is difference between cabinet and cavalier projections?
- c) What is meant by perspective foreshortening?
- d) In context of interactive curve design, what do you mean by property of local control?
- e) Differentiate between flat shading and smooth shading. (5x2)

UNIT - I

II. a) Describe Bresenham line drawing algorithm. Making use of Bresenham line drawing algorithm, find out the coordinates of the point that lie on line from (8,7) to (14,12)?

b) Using mid-point circle generation algorithm, compute the coordinates of points that lie on the boundary of the circle with radius 6 and centre as (8,8). (5,5)

III. a) What are homogenous coordinates? What is their use?

b) What are the conditions under which 2-D scaling and rotation form a commutative pair of operations?

c) Reflect the diamond-shaped polygon whose vertices are A(-1,0), B(0,-2), C(1,0), and D(0,2) about the line $y=2x+1$. (2,4,4)

IV. a) With the help of examples, describe in detail Liang-Barsky line clipping algorithm.

b) Find the normalization transformation that maps a window whose lower left corner is at (1,1) and upper right corner is at (3,5) onto a viewport that is the entire normalized device screen. (5,5)

P.T.O.

(2)

UNIT - II

- V. a) Using $C(a, b, c)$ as the centre of projection, derive the matrix for perspective transformation onto the plane passing through the point $R_0(x_0, y_0, z_0)$ and having the normal vector $N = n_1I + n_2J + n_3K$.
- b) The pyramid defined by the coordinates $A(0,0,0)$, $B(1,0,0)$, $C(0,1,0)$ and $D(0,0,1)$ is rotated 45 degree about the line L that has the direction $V = J+K$ and passing through point $C(0,1,0)$. Find the coordinates of the rotated figure. (5,5)
- VI. a) Describe in detail Gouraud's method for smooth shading.
- b) What do you mean by hidden surface? Why is it removed? Describe in detail scan line method for hidden surface elimination. (5,5)
- VII. Write short notes on:-
- a) Computer Animation
- b) Bezier curves and their properties (5,5)

x-x-x