Exam.Code:0917
Sub. Code: 33435

2076

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. I which is compulsory and selecting two questions from each Section.

x-x-x

I. Write short answers of the following:

a. Why computer generated lines which are not parallel to x-axis or y-axis and which are not inclined at ±45° to x- or y-axis appears to be zigzagged?
b. What are the limitations of Sutherland-Hodgeman polygon clipping algorithm?
c. Write the transformation matrix for reflection about line y=x.
d. Differentiate between raster-scan systems and random-scan systems.
e. What do you mean by flat shading and smooth shading?

(5×2=10)

Section-A

II.

a. Derive the decision parameters for mid-point circle drawing algorithm and explain its working. How does it make use of 8-way symmetry?
b. Making use of mid-point circle drawing algorithm, find the coordinates of points that lie on the boundary of the circle centered at (6,8) and having radius of 5 units. **(5,5)**

III.

a. Define window and viewport. Describe how the contents of a window can be mapped onto a viewport.
b. Describe in detail Liang-Barsky algorithm for line clipping. **(5,5)**

IV.

a. Find the form of transformation matrix for reflection about a line L with slope m and y intercept $(0, b)$.
b. Describe in brief various application areas of computer graphics. **(5,5)**

Section-B

V.

a. Describe in detail painter's algorithm for hidden surface elimination.
b. Differentiate between object-space and image-space methods for visible surface detection. **(5,5)**

VI.

a. 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.
b. What are B-splines? How are they generated? Compare and contrast them with Bezier curves. **(5,5)**

VII.

a. Find the matrix for mirror reflection with respect to the plane passing through the origin and having a normal vector whose direction is N=I+J+K.
b. Explain Gouraud's method for smooth shading.

(5,5)

x-x-x