Code No: RR320502 **Set No. 1**

III B.Tech II Semester Supplimentary Examinations, Apr/May 2008
COMPUTER GRAPHICS
(Computer Science & Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Discuss about the optical scanning mechanism followed in image scanners.
   (b) Discuss the functioning of joystick. [8+8]

2. (a) Write an algorithm to draw a straight line between two end points using digital differential analyzer (DDA) algorithm.
   (b) Compute the intermediate points using the DDA algorithm, when the end points of the line are given as (0,0) and (7,4). [8+8]

3. (a) List the basic transformations which cause the physical distortion in the transformed object.
   (b) An object point P(x,y) is translated in the direction U = aI + bJ and simultaneously an observer moves in the direction U. Show that there is no apparent motion of the object point from the point of view of obsever. [8+8]

4. (a) Find the general form of the transformation N which maps a rectangular window with x extent xw_{min} to xw_{max} in the x-direction and y extent y_{wmin} to y_{max} in the y-direction on to a rectangular view port with x extent x_{vmax} to x_{vmax} and y extent y_{vmin} to y_{vmax}.
   (b) Distinguish between Cohen-Sutherland outcode and Sutherland-Hodgeman algorithm. [8+8]

5. Drive the matrix form for the geometric transformations in 3-D graphics for the following operations.
   (a) Translation
   (b) Scaling
   (c) Mirror reflections. [5+5+6]

6. (a) List the conditions, which require no re-ordering of surfaces in painter's algorithm.
   (b) Explain how to implement painter's algorithm when the polygons over-laped in cyclic order. [8+8]

7. (a) Prove that a Bezier curve in the plane is axis independent.
   (b) Demonstrate that B-spline curve follows local control. [8+8]

8. Discuss about the following graphical animation languages.

(a) P-curve

(b) DIAL [8+8]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: RR320502 **Set No. 2**

III B.Tech II Semester Supplimentary Examinations, Apr/May 2008
COMPUTER GRAPHICS
(Computer Science & Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Explain the design issues in color CRT monitors.
   (b) Distinguish between CRT monitors and direct view storage tube (DVST) devices. [8+8]

2. (a) Draw the flow chart for Bresenham's incremental circle algorithm in the first octant.
   (b) Discuss about the reflections required for generating the complete circle using the first octant of the origin centered circle. [8+8]

3. (a) Prove that the multiplication of two successive scaling matrices are commutative.
   (b) Show that two successive reflections about either of the coordinate axis is equivalent to the original input object. [8+8]

4. (a) Using steps followed in Sutherland-Hodgeman algorithm, determine the intersection point of the line segment P_1 P_2 against a clipping window P_3P_4 where coordinate of end points are $P_1(0,0)$ $P_2(3,2)$ $P_3(3,0)$ and $P_4(0,2)$.
   (b) Why the Sutherland-Hodgeman algorithm is called as re-entrant algorithm. [8+8]

5. Drive the matrix form for the geometric transformations in 3-D graphics for the following operations.
   (a) Translation
   (b) Scaling
   (c) Mirror reflections. [5+5+6]

6. (a) How is the depth of a polygon determined by the painter's algorithm?
   (b) Assuming that one allows 128 depth value levels to be used, how much memory would a 512×512 pixel display require to store the Z-buffer? If the seence consists of 14 objects what is the frame buffer memory requirement. [8+8]

7. (a) State the blending function for B-spline surface. Explain the terms involved in it.
   (b) Prove with suitable demonstration that the B-spline surface follows local control. [8+8]

8. (a) What is meant by animation? Explain.

(b) Discuss the characteristics of key-frame animation. [8+8]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: RR320502 **Set No. 3**

III B.Tech II Semester Supplimentary Examinations, Apr/May 2008
COMPUTER GRAPHICS
(Computer Science & Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. Explain the construction and functioning of shadow mask-CRT devices. [8+8]
2. What is meant by aliasing? Discuss about the two antialiasing methods. [6+5+5]
3. (a) Show that the shearing factors applied in x and y directions are independent. That is $Sh_{a,1} {}^{*} Sh_{1,b} = Sh_{a.b.}$
   (b) Briefly discuss about co-ordinate transformations. [8+8]
4. (a) Find the general form of the transformation N which maps a rectangular window with x extent xw_{min} to xw_{max} in the x-direction and y extent y_{wmin} to y_{max} in the y-direction on to a rectangular view port with x extent x_{vmax} to x_{vmax} and y extent y_{vmin} to y_{vmax}.
   (b) Distinguish between Cohen-Sutherland outcode and Sutherland-Hodgeman algorithm. [8+8]
5. Derive the matrix form for perspective projection transformation using 3-demensional homogenous representation. With a neat sketch, describe various parameters involved in the matrix representation. [16]
6. (a) Show how the calculations of the intersection of an edge with a scan line can be made incremental as opposed to absolute.
   (b) What difficulties are encountered in implementing the painter's algorithm? [8+8]
7. (a) Distinguish between analytic and synthetic methods of shape description.
   (b) Distinguish curve and surface in 3-D space. [8+8]
8. (a) What is meant by temporal aliasing? How to overcome this limitation?
   (b) What is meant by interframe coherence? [10+6]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: RR320502 **Set No. 4**

III B.Tech II Semester Supplimentary Examinations, Apr/May 2008
COMPUTER GRAPHICS
(Computer Science & Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Explain the following terms.
   i. Persistence of phosphor
   ii. Flicker
   iii. Refresh rate
   iv. Blurring
   (b) What are the advantages and disadvantages of LCD over raster-scan CRT? [8+8]

2. (a) Explain how the edge flag algorithm is implemented for polygon filling?
   (b) Distinguish the merits and demerits of different scan line algorithms. [8+8]

3. (a) Characterize the transformation with suitable matrix formulation for the following operations $x' = x + ay$ *and* $y' = y$.
   (b) Show that the scaling factors applied in x and y directions are independent. That is $S_{sx,1} {}^{*} S_{1,sy} = S_{sx,sy.}$ [8+8]

4. Explain the approaches followed in different line clipping algorithms: compare and contrast the characteristics. [8+8]

5. Distinguish the transformations performed in 2-D graphics and 3-D graphics. Explain how many matrices are needed to define each of the basic transformations. [8+8]

6. (a) Describe different parameters which influence the surface illumination.
   (b) Discuss the principle followed in polyhedral model of shading. [8+8]

7. What is parametric function? How the points on a curve are represented using parametric function. [6+10]

8. (a) What is meant by animation? Explain.
   (b) Discuss the characteristics of key-frame animation. [8+8]

⋆ ⋆ ⋆ ⋆ ⋆