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

III B.Tech II Semester Supplimentary Examinations, Aug/Sep 2007
COMPUTER GRAPHICS
(Computer Science & Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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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) Distinguish the merits and demerits of scan line algorithm and flood fill algorithm.
   (b) Discuss about the super sampling approach followed for antialiasing. [10+6]

3. (a) What is meant by composite transformations?
   (b) Write the general form of a scaling matrix with respect to a fixed point P(h,k) where the scaling factors in x and y directions are a and b respectively. [6+10]

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. (a) If P (x, y, z) is an object reference point for scaling, explain how the scaling operation is defined in terms of scaling with respect to the origin.
   (b) Show that the multiplication of two successive scalings is commutative. [8+8]

6. (a) Discuss about 3-dimensional viewing pipe line.
   (b) Write a brief note about the following:
   i. View plane
   ii. View reference
   iii. View plane normal. [7+9]

7. (a) What is the blending function used in Bezier's method for curve generation? Explain the terms involved in it?
   (b) What are the properties of Bezier curve? [10+6]

8. (a) What are the steps involved in two-pass Z-buffer shadow algorithm?
   (b) What is meant by ray tracing? [10+6]

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

III B.Tech II Semester Supplimentary Examinations, Aug/Sep 2007
COMPUTER GRAPHICS
(Computer Science & Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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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) 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) 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. 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) Discuss about 3-dimensional viewing pipe line.
   (b) Write a brief note about the following:
      i. View plane
      ii. View reference
      iii. View plane normal. [7+9]
7. Explain the steps involved in Bezier's method for curve generation. [16]
8. (a) What is the mechanism followed for tracking live action in animated scenes?
   (b) Describe the problem of temporal aliasing. [8+8]

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

III B.Tech II Semester Supplimentary Examinations, Aug/Sep 2007
COMPUTER GRAPHICS
(Computer Science & Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) What is the role of digital to analog converter (DAC)? Where is it placed in video display devices?
   (b) Explain the mechanism of increasing the colors/gray levels without increasing the frame buffer memory. [8+8]
2. What is meant by aliasing? Discuss about the two antialiasing methods. [6+5+5]
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) What is viewing transformation? Explain the steps involved in it.
   (b) What are the advantages and disadvantages of Cohen Sutherland outcode 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. List and explain the procedures followed in different smooth shading algorithms. Analyse the computational complexities in each. [16]
7. (a) Explain the procedure followed in Bezier's methods for curve generation.
   (b) What is the role of control points in Bezier's approach? [10+6]
8. (a) What are the steps involved in two-pass Z-buffer shadow algorithm?
   (b) What is meant by ray tracing? [10+6]

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

III B.Tech II Semester Supplimentary Examinations, Aug/Sep 2007
COMPUTER GRAPHICS
(Computer Science & Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) What are the merits and demerits of raster-scan CRT.
   (b) Consider a raster system with resolution of 640×480. How many pixels could be accessed per second by a display controller that refreshes the screen at a rate of 60 frames per second. What is the access time per pixel? [8+8]

2. (a) Write an algorithm to derive the straight line using Bresenham's algorithm when the slope of the line(m) is less than 45^0.
   (b) Distinguish between simple DDA and Bresenham's algorithm for line generation. [8+8]

3. (a) Derive the transformation matrix for reflection about y=x + 2 line.
   (b) Find the reflection of the point A(10,10) about the line y= x + 2. [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. Derive the matrix form for the following basic geometric transformations in 3-D graphics:
   (a) Rotation
   (b) Mirror reflection. [8+8]

6. (a) What are the advantages of mini max test in z-buffer algorithm?
   (b) A polygon has a plan equation ax + by + cz + d = 0. Suppose that we know the value of 'z' at a point (x, y). What is the easiest way to calculate the value of z at (x + 1,y) and at (x, y + 1)? [8+8]

7. (a) What is the blending function used in Bezier's method for curve generation? Explain the terms involved in it?
   (b) What are the properties of Bezier curve? [10+6]

8. Discuss about the graphical languages followed to achieve animation. [16]

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