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

III B.Tech II Semester Regular Examinations, Apr/May 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 most popular alternatives to the raster-scan CRT. Distinguish the merits and limitations of the video display devices.
   (b) What are the major components of CRT device? Explain their role in the graphical display. [8+8]
2. What is meant by aliasing? Discuss about the two antialiasing methods. [6+5+5]
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) 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. (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 the steps involved in computation of surface normal at a vertex when
      i. the plane equations of surrounding polygons in given and
      ii. the coordinates of vertices are given.
   (b) Discuss how the Mach-band effects are eliminated in Phong shading. [4+4+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) Discuss about the following:
      i. Slow-in and Slow-out
      ii. Moving-points path
      iii. Euler angles.
   (b) Discuss about the algebraic structure-"quaternions". [9+7]

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

III B.Tech II Semester Regular Examinations, Apr/May 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 design issues in color CRT monitors.
   (b) Distinguish between CRT monitors and direct view storage tube (DVST) devices. [8+8]
2. What is meant by aliasing? Discuss about the two antialiasing methods. [6+5+5]
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) Let R be a rectangular window whose left hand corner is at L (-4, 0) and right hand corner is at R (1,5). Find the end point 4-bit codes for the following points.
      i. F (1,2)
      ii. G (2, -3)
      iii. H (3,3)
      iv. J (-3,10).
   (b) Explain why the Sutherland-Hodgeman algorithm is called re-entrant algorithm? [8+8]
5. Derive the transformation matrix for aligning the vector V =I+J+K with the vector K. [16]
6. Discuss about the following:
   (a) Parametric functions
   (b) Mach-band effect
   (c) Surface normal. [6+5+5]
7. (a) Discuss the properties of natural cubic splines.
   (b) Discuss about the parametric function followed in Hermite spline. [8+8]
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 Regular Examinations, Apr/May 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 terms
   i. Framebuffer
   ii. Resolution
   (b) Suppose an RGB raster system is to be designed using and 8 inch by 10 inch screen with a resolution of 100 pixels per inch in each direction. If we want to store 6 bits per primary color per pixel, how much storage (in bytes) do we need for the frame buffer? [10+6]
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) 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) Discuss the steps involved in mid-point subdivision algorithm.
   (b) What are the limitations of mid-point subdivision algorithm? [8+8]
5. Find a transformation Av which alongs a given vector V with the vector K along the positive Z-axis. [16]
6. Discuss about the following:
   (a) Parametric functions
   (b) Mach-band effect
   (c) Surface normal. [6+5+5]
7. (a) State blending function used in B-spline curve generation. Explain the terms involved in it.
   (b) What are the properties of B-spline curves? [10+6]
8. (a) What is meant by animation? Explain.
   (b) Discuss the characteristics of key-frame animation. [8+8]

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

III B.Tech II Semester Regular Examinations, Apr/May 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 most popular alternatives to the raster-scan CRT. Distinguish the merits and limitations of the video display devices.
   (b) What are the major components of CRT device? Explain their role in the graphical display. [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) Derive mathematically, the transformation that rotates an object point θ^0 anti-clock wise, about the origin. Write the matrix representation for this rotation.
   (b) Rotate the point P(2,-4) about the origin 30^0 in anti-clockwise direction. [8+8]

4. (a) Let R be the rectangular window whose lower left hand corner is at L (-3,1) and upper right-hand corner is at R (2,6). Find the end bit codes for the following points.
      i. A(-4,2)
      ii. B(-1,7)
      iii. C(-1,5)
      iv. D(3,8)
   (b) How do we determine whether a point p(x,y) lies to the left or to the right of a line segment joining the points $A(x_1, y_1)$ and $B(x_2, y_2)$? [8+8]

5. How the plane equation is defined in 3-D space? Explain the steps involved in the transformation for mirror reflection about an arbitrary plane. [16]

6. (a) Given the point $P_1(3, 6, 20)$, $P_2(2, 4, 6)$ and $P_3(2, 4, 6)$ a view point C (0.0, -10), determine which points obscure the others when viewed from C.
   (b) What is meant by edge coherence? What is its significance in depth-buffer algorithm? [8+8]

7. (a) Distinguish zero-order, first-order and second-order continuity.
   (b) What is the organization of control points followed in Bezier's method to ensure second order continuity?

(c) What are the properties of Bezier's curve? [5+5+6]

8. (a) Discuss about the general purpose languages used for animation.

(b) Discuss about the relative advantages and disadvantages of the general purpose languages. [8+8]

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