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

III B.Tech II Semester Regular Examinations, Apr/May 2006
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. List the operating characteristic of the following display technologies:
   (a) Raster refreshes systems
   (b) Vector refresh systems
   (c) Plasma panels and
   (d) LCD. [4×4]
2. (a) Briefly explain about different image compression techniques.
   (b) Explain the steps involved in simple parity scan conversion algorithm. [10+6]
3. (a) Prove that the multiplication of two successive translation matrices are commutative.
   (b) Prove or disprove that the reflection operation could be simulated by other basic transformations. [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. Derive the matrix form for the following basic geometric transformations in 3-D graphics:
   (a) Rotation
   (b) Mirror reflection. [8+8]
6. (a) How does scan-line coherence help to reduce computation in Z-buffer algorithm?
   (b) Assuming that one allows 256 depth value levels to be used, approximately how much memory would a 512×512 pixel display require to store the Z-buffer? [8+8]
7. (a) Explain with suitable figures the geometrical representation of the blending functions used in Bezier curve when the numbers of control points are four.
   (b) Demonstrate that the Bezier's methods follow global control. [8+8]
8. Discuss about the problems peculiar to animation and propose suitable solutions. [16]

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

III B.Tech II Semester Regular Examinations, Apr/May 2006
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. Discuss the construction and functioning of the following input devices:
   (a) Key board
   (b) Mouse [8+8]
2. (a) Discuss the steps involved in the ordered edge list algorithm.
   (b) What are the advantages of edge flag algorithm. [8+8]
3. (a) What is meant by homogeneous representation of transformation matrices. Why it is necessary.
   (b) List the homogeneous representation of all the basic transformations.
   (c) Find the transformation matrix that represents rotation of an object by 30^0 clock wise, about the origin. [5+5+6]
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. List and explain the procedures followed in different smooth shading algorithms. Analyse the computational complexities in each. [16]
7. (a) Discuss about different approaches for shape description.
   (b) Discuss about the role of parametric functions in curve generation. [8+8]
8. Discuss about the graphical languages followed to achieve animation. [16]

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

III B.Tech II Semester Regular Examinations, Apr/May 2006
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 following components in a CRT device.
   i. Control grib
   ii. Focusing system.
   iii. Accelerating a node
   iv. Horizontal and vertical deflection plates.
   (b) Discuss about the characteristics of direct view storage tube (DVST) devices. [8+8]

2. (a) Explain about area image compression technique.
   (b) What is the procedure followed in minimax (Boxing) test? What is its advantage? [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) Explain the line-clipping algorithm using mid-point sub-division approach.
   (b) How the stack size and length of the line segment are related in the context of mid-point subdivision algorithm?
   (c) Explain how the visibility test is performed with respect to a given vector. [8+4+4]

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 the characteristics of the following illumination parameters.
   i. Diffuse refection
   ii. Specular reflection and
   iii. Refraction.
   (b) At a surface point p, if the surface normal, light vector and sight vectors are given by n = j, L = -I + 2j-k and s = I + 1.5j + 05k respectively, find the vector of reflected ray and the angle it is making with surface normal. [9+7]

7. Justify that the Bezier's method possesses global control in curve generation. Demonstrate with suitable illustrations. [16]

8. Give a detailed note of the following rules of animation.

   (a) Slow-in and Slow-out

   (b) Stage the action. [8+8]

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

III B.Tech II Semester Regular Examinations, Apr/May 2006
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. Discuss about the construction and functioning of different graphical input devices. [8+8]

2. (a) Briefly explain about different image compression techniques.
   (b) Explain the steps involved in simple parity scan conversion algorithm. [10+6]

3. (a) What is meant by homogeneous representation of transformation matrices. Why it is necessary.
   (b) List the homogeneous representation of all the basic transformations.
   (c) Find the transformation matrix that represents rotation of an object by 30^0 clock wise, about the origin. [5+5+6]

4. (a) Explain the terms: world coordinate system, normalized device coordinate system and physical device coordinate system.
   (b) Explain the procedure followed to determine whither a line segment is intersection a given vector or not. [8+8]

5. (a) Derive the matrices for rotations about three principle axis in 3-D graphics.
   (b) What is meant by homogeneous co ordinates? What is its significance? [8+8]

6. (a) Discuss about the characteristics of the following illumination parameters.
      i. Diffuse refection
      ii. Specular reflection and
      iii. Refraction.
   (b) At a surface point p, if the surface normal, light vector and sight vectors are given by n = j, L = -I + 2j-k and s = I + 1.5j + 05k respectively, find the vector of reflected ray and the angle it is making with surface normal. [9+7]

7. (a) State the blending function suitable for Bezier surface and explain the terms involved in it.
   (b) Demonstrate that Bezier curve is axis independent. [8+8]

8. (a) Discuss the procedural control methods of animation.
   (b) What are the advantages of procedural control over full explicit control. [8+8]

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