Code No: RR311203 **Set No.1**

III B.Tech. I Semester Supplementary Examinations, May -2005
COMPUTER GRAPHICS
(Common to Information Technology and Electronics & Computer 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.
2. (a) Explain how the area antialiasing technique is implemented?
   (b) Distinguish between antialiasing and halftoning.
3. (a) Show that two successive rotations about the origin are commutative. That is $R\varphi_{1,}\, R\varphi_{2,} \;=\; R\varphi_{2,}\, R\varphi_{1.}$
   (b) Reduce the triangle with vertices A(0,0), B(1,1) and C(0,1) to half of its size while keeping B(1,1) fixed.
4. Explain the approaches followed in different line clipping algorithms: compare and contrast the characteristics.
5. Find the transformation matrix which aligns the vector V=I+J+K with the vector N 2I-J-K.
6. (a) Explain the steps involved in transformation from a world coordinate description of a 3-D object to device coordinates.
   (b) Explain the procedure followed for back face detection.
7. (a) Discuss about the luminosity function of three primary colors.
   (b) Briefly discuss about chromaticity diagram.
8. Discuss about the following graphical animation languages.
   (a) P-curve
   (b) DIAL

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Code No: RR311203 **Set No.2**

III B.Tech. I Semester Supplementary Examinations, May -2005
COMPUTER GRAPHICS
(Common to Information Technology and Electronics & Computer 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 of LCD over raster-scan CRT?
2. (a) Briefly explain about different image compression techniques.
   (b) Explain the steps involved in simple parity scan conversion algorithm.
3. (a) Show that the composition of two rotations is additive that is, $R(\varphi_1).R(\varphi_2) = R(\varphi_1 + \varphi_2)$.
   (b) Characterize the transformation with suitable matrix formulation, for the following operations: $x^{'} = x + a.y, \quad y^{'} = bx + y$.
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.
5. Drive the matrix form for the geometric transformations in 3-D graphics for the following operations.
   (a) Translation
   (b) Scaling
   (c) Mirror reflections.
6. Classify the shading algorithms. Explain the principle followed in each of the algorithms. Discuss their merits and demerits.
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?
8. Explain how the animation is implemented using the following graphical animation languages.

(a) DIAL

(b) S-Dynamic system

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Code No: RR311203 **Set No.3**

III B.Tech. I Semester Supplementary Examinations, May -2005
COMPUTER GRAPHICS
(Common to Information Technology and Electronics & Computer 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 of LCD over raster-scan CRT?
2. (a) Discuss the steps involved in the ordered edge list algorithm.
   (b) What are the advantages of edge flag algorith.
3. (a) Prove that the multiplication of two successive rotation matrices is commutative.
   (b) Show that the reflection about the line y=x is equivalent to a reflection relative to the x-axis followed by a counter clock wise rotation of 90^0.
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.
5. The pyramid defined by the co-ordinates A(0,0,0), B(1,0,0), C(0,1,0) and D(0,0,1) is rotated 45^0 about the line L that has the direction V = J+K and passing through the point C(0,1,0). Find the co-ordinates of the rotated pyramid.
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?
7. (a) Distinguish between analytic and synthetic methods of shape description.
   (b) Distinguish curve and surface in 3-D space.
8. Discuss about the techniques to achieve the simple animation effects.

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Code No: RR311203 **Set No.4**

III B.Tech. I Semester Supplementary Examinations, May -2005
COMPUTER GRAPHICS
(Common to Information Technology and Electronics & Computer Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) What is meant by gray level. If 10 bits of frame buffer memory id allocated to each pixel, how many gray levels are possible per pixel.
   (b) Explain how the frame buffer is logically organized to display color images on video display unit.
2. (a) Discuss the steps involved in the ordered edge list algorithm.
   (b) What are the advantages of edge flag algorith.
3. (a) Compute the suitable transformation matrix for transforming a coordinate point P=(x,y) is one Cartesian system to the coordinate values (x,y) in another Cartesian system where $x' = x\cos\varphi + y\sin\varphi$. $y' = -x\sin\varphi + y\cos\varphi$.
   (b) Determine the form of the transformation matrix for a reflection about an arbitrary line with equation y=mx+b.
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.
5. Find the transformation matrix which aligns the vector V=I+J+K with the vector N 2I-J-K.
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.
7. (a) Explain the conversion formulae to convert HLS to RGB system.
   (b) What are the characteristics of HSV color model?
8. Discuss about different methods of controlling animation.

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