2011

Time : 3 hours

Full Marks : 80

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Answer from both the Groups as directed.

Group – A

(Objective Types Questions)

1. Choose the correct answer of the following :

\[ 2 \times 10 = 20 \]

(a) The increase in X or Y is determined by examine the distance between \( \text{LOC}^{N} \) and nearest pixel. This distance is called ______.
   (i) Decision variable or Error gradient
   (ii) E or Error

JX – 29/2   (Turn over)
(iii) Proposition to D1...D2
(iv) All of the above

(b) The orthographic projection that can display more than one face of object is called ______ and most commonly used is the ______ program.
   (i) Axonometric, Isometric
   (ii) Oblique, Perspective
   (iii) Cabinet, Cavalier
   (iv) One point, Two point

(c) Algorithm that fill interior defines region are called ______ algorithm, those that fill boundary defined region are called ______ algorithm.
   (i) Flood fill, Boundary fill
   (ii) Flood fill, Edge fill
   (iii) Boundary fill, Edge fill
   (iv) Both (i) and (ii)

(d) The ______ line is straight but its ______ is not constant.
   (i) 40°, Width
   (ii) 60°, Height

JX – 29/2 (2) Contd.
(iii) 30^0, Length
(iv) None of the above

(e) _____ give the color of specified pixel and _____ Draws the pixel with specified color.
   (i) Getpixel(), Putpixel()
   (ii) Putpixel(), Getpixel()
   (iii) Both (i) and (ii)
   (iv) None of the above

(f) Inside the frame buffer the image is stored as a pattern of _____ digital numbers.
   (i) Octal
   (ii) Binary
   (iii) Hexadecimal
   (iv) Decimal

(g) The shift register is operated in _____ fashion i.e., similar to _____.
   (i) FIFO, Queue
   (ii) FILO, Stack
   (iii) LIFO, Stack
   (iv) None of the above

JX  29/2  (3) (Turn over)
(h) In DDA, the rasterized line lies to both side of actual line i.e., algorithm is _____ dependent and here end point accuracy is _____.

(i) Rasterization, 90%
(ii) Orientation, Poor
(iii) Orientation, Good
(iv) Conversion, Poor

(i) A point (4, 3) is rotated counter clockwise by 45°, find out resultant point.

   (i) $1/\sqrt{2}, 7/\sqrt{2}$
   (ii) $4/\sqrt{2}, 3/\sqrt{2}$
   (iii) $7/\sqrt{2}, 1/\sqrt{2}$
   (iv) $3/\sqrt{2}, 4/\sqrt{2}$

(j) In midpoint circle drawing algorithm the following terms are as initialize position of $x = _____, \ y = _____, \ d = _____,$ if $d > 0$ then $d' = _____.$

   (i) $0, r, 1.25 - r, d + 2x + 1$
   (ii) $r, r, 1.25 - r, d + 2y + 1$
(iii) 0, 0, 1.25 + r, d + 2x + 1
(iv) None of the above

Group - B

(Long-answer Type Questions)

Answer any four of the following: \( 15 \times 4 = 60 \)

2. Explain Graphics Monitor and differentiate between Raster Scan and Random Scan Display. Also explain the term virtual reality.

3. Illustrate the Bresenham's line algorithm for a line with end points \((30, 10)\) and \((40, 18)\). Also discuss the Cohen-Sutherland algorithm for line-clipping.

4. What are the different line attributes? Also explain shear transformation and exterior clipping?

5. Describe the constant intensity method in surface shading. What is diffuse reflection in 3D computer graphics?

6. Discuss the various types of perspective projections. Define the term Phong shading. A 2D object scaling from the base coordinate \((0, 0)\) to

\[ JX - 29/2 \]  \hspace{1cm} (5) \hspace{1cm} (Turn over)
2 units and then rotated in clockwise direction through 30 degree, then calculate the final coordinate of the object.

7. Write short notes on any three of the following computer graphics devices:
   (a) Graphics Tablet
   (b) Voice System
   (c) LCD Device
   (d) Track Ball

8. What do you mean by Gouraud shading? What are the difference between Gouraud shading and Phong shading?

9. Explain the diffuse reflection in 3D computer graphics. What is homogenous and Cartesian coordinate system?