

**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 :

2×10 = 20

(a) The increase in X or Y is determined by examine the distance between  $LOC^N$  and nearest pixel. This distance is called \_\_\_\_\_.

- (i) Decision variable or Error gradient
- (ii) E or Error

- (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)  $40^\circ$ , Width
  - (ii)  $60^\circ$ , Height

- In DDA, the raster is \_\_\_\_\_
- (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

(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  $45^\circ$ , 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  $x = \underline{\hspace{1cm}}$ ,  $y = \underline{\hspace{1cm}}$ ,  $d = \underline{\hspace{1cm}}$ , if  $d > 0$  then  $d^1 = \underline{\hspace{1cm}}$ .

- (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

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?

