

**2024**

**( 5th Semester )**

**BACHELOR OF COMPUTER APPLICATIONS**

**Paper : CMG-503 (Old Course)**

**( Computer Graphics )**

**Full Marks : 70**

**Pass Marks : 45%**

**Time : 3 hours**

**( PART : B—DESCRIPTIVE )**

**( Marks : 45 )**

*The figures in the margin indicate full marks  
for the questions*

1. (a) Explain the working of a CRT monitor with a neat diagram. 5
- (b) What do you mean by retracing? Explain horizontal retracing and vertical retracing. 4
- Or
- (c) Explain shadow mask techniques with the help of a diagram. 5
- (d) List out the advantages and disadvantages of a plasma panel display. 4

2. (a) Using Bresenham's algorithm, generate the coordinate of the pixels that lie on the line segment having the starting and ending points (9, 18), (14, 22). 7
- (b) What is antialiasing? How does it work? 2

Or

- (c) Draw a circle with  $r = 14$  and centres at (15, 10) using mid-point circle generating algorithm. 6
- (d) Explain scan-line polygon filling algorithm. 3

3. (a) Given a triangle with points (1, 1), (0, 0) and (1, 0). Apply shear parameter 2 on X-axis and 2 on Y-axis and find out the new coordinates of the object. 9

Or

- (b) Given a square object with coordinate points A (0, 3), B (3, 3), C (3, 0), D (0, 0). Apply the scaling parameter 2 towards X-axis and 3 towards Y-axis and obtain the new coordinates of the object. 9
4. (a) What is a polygon table? Explain. 4
- (b) What is Bezier curve? State any five properties. 4
- (c) What is space partitioning? 1

Or

- (d) What is polygon mesh? How is it represented? Give its advantages and disadvantages. 5
- (e) What is a knot in B-spline curve? 2
- (f) What is a surface patch? 2
5. (a) Describe depth-buffer method. Explain its importance. 5
- (b) Explain 3D scaling and translation. 4

Or

- (c) Explain scan-line method. 5
- (d) What is a hidden-surface problem? 2
- (e) Explain 3D rotation. 2

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2024

( 5th Semester )

**BACHELOR OF COMPUTER APPLICATIONS**

Paper : CMG-503 (Old Course)

**( Computer Graphics )**

( PART : A—OBJECTIVE )

( Marks : 25 )

*The figures in the margin indicate full marks for the questions*

**A.** Put a Tick (✓) mark against the correct answer in the brackets provided : 1×10=10

1. Which of the following are the features of computer graphics?

- (a) Creation and deletion of images by computer ( )
- (b) Deletion and manipulation of graphical images by computer ( )
- (c) Creation and manipulation of graphics by computer ( )
- (d) Creation of artificial images by computer only ( )

2. The process of positioning an object along a straight line path from one coordinate point to another is called

(a) translation ( )

(b) reflection ( )

(c) shearing ( )

(d) transformation ( )

3. Which of the following equations is used in 2D translation to move a point  $(x, y)$  to the new point  $(x', y')$ ?

(a)  $x' = x + t_y$  and  $y' = y + t_x$  ( )

(b)  $x' = x - t_x$  and  $y' = y - t_y$  ( )

(c)  $x' = x + t_x$  and  $y' = y + t_y$  ( )

(d)  $x' = x + t_x$  and  $y' = y - t_y$  ( )

4. Which of the following must be specified to generate a rotation?

(a) Rotational distance ( )

(b) Rotation angle ( )

(c) Coordinates ( )

(d) None of the above ( )

5. Smallest size object that can be displayed on a monitor is called

(a) picture element ( )

(b) point ( )

(c) dot pitch ( )

(d) aspect ratio ( )

6. The point about which an object is rotated is called

(a) fixed point ( )

(b) central point ( )

(c) pivot point ( )

(d) None of the above ( )

7. Coordinate value for each vertex is stored in

(a) coordinate table ( )

(b) vertex table ( )

(c) edge table ( )

(d) location table ( )

8. The process of extracting a portion of a database or a picture inside or outside a specified region is called
- (a) transformation ( )
  - (b) projection ( )
  - (c) clipping ( )
  - (d) rotation ( )
9. To set line width attributes in a PHIGS package, \_\_\_\_\_ function is used.
- (a) set line thickness (lw) ( )
  - (b) set line width (lw) ( )
  - (c) set polyline width (lw) ( )
  - (d) set line width scale factor (lw) ( )
10. Which of the following is a computer graphics curve?
- (a) Bezier curve ( )
  - (b) Implicit curve ( )
  - (c) Explicit curve ( )
  - (d) All of the above ( )

B. Indicate whether the following statements are True (T) or False (F) by putting a Tick (✓) mark : 1×5=5

1. In a graphical system an array of pixels in the picture are stored in frame buffer.

( T / F )

2. The process of elimination of parts of a scene outside a window or a viewport is called as editing.

( T / F )

3. Scan conversion is the process of digitizing a given picture definition into a set of pixel-intensities for storage in the frame buffer.

( T / F )

4. The Cohen-Sutherland algorithm is more efficient than the Liang-Barsky algorithm.

( T / F )

5. The duration of the phosphorescence exhibited by a phosphor is known as persistence.

( T / F )

C. Answer the following questions in short :

2×5=10

1. What do you mean by emissive and non-emissive display?

2. Write the algorithm of the line drawing algorithm using DDA.

3. Discuss the difference between the rotation about the origin and the rotation about the local point.

4. What are the advantages of B-spline over Bezier curve?

5. What is parallel projection?

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