

Roll No. ....

## **BCA-501 (DE1)**

### **B. C. A. (Fifth Semester) EXAMINATION, 2024-25**

#### **COMPUTER GRAPHICS**

*Time : 2 $\frac{1}{2}$  Hours*

*Maximum Marks : 60*

**Note :** All questions have to attempted.

**Section—A**                                    1 each

#### **(Multiple Choice Questions)**

1. (a) Which of the following attributes does Bresenham's algorithm follow ? (CO2, BL-2)
  - (i) It is an incremental method
  - (ii) It chooses points randomly
  - (iii) It uses floating point operations
  - (iv) All of the above

**P. T. O.**

- (b) Which algorithm is used to color a pixel if it hasn't been colored yet and skips if it's already filled ? (CO3, BL-4)
- (i) Boundary full Algorithm
  - (ii) Scan line polygon fill algorithm
  - (iii) Flood fill Algorithm
  - (iv) All of the above
- (c) Which function call set up the size of the output area ? (CO1, BL-1)
- (i) glviewport( )
  - (ii) glu Perspective( )
  - (iii) glDisplayfunc( )
  - (iv) None of the above
- (d) The region code of a point within the window is ..... . (CO3, BL-2)
- (i) 1111
  - (ii) 0000
  - (iii) 1000
  - (iv) 0001

- (e) Which of the following device is used for the 3D positioning of an object ? (CO2, BL-1)
- (i) Trackball
  - (ii) Mouse
  - (iii) Spaceball
  - (iv) All of the above
- (f) Random Scan System is used for : (CO1, BL-1)
- (i) Color drawing application
  - (ii) Pixel drawing application
  - (iii) Line drawing application
  - (iv) None of the above
- (g) ..... is a rigid body transformation that moves objects with deformation. (CO4, BL-1)
- (i) Rotation
  - (ii) Scaling
  - (iii) Translation
  - (iv) All of the above
- (h) In which system, the Shadow Mask methods are commonly used ? (CO1, BL-1)
- (i) Raster scan system
  - (ii) Random scan system
  - (iii) None of the above
  - (iv) Both (i) and (ii)

(i) In Bresenham's line Drawing Algorithm, how is the decision parameter  $pk$  updated when drawing a line with a slope between 0 and 1 ?

(CO2, BL-3)

(i)  $pk + 1 = pk + 2\Delta y$

(ii)  $pk + 1 = pk + 2(\Delta y - \Delta x)$  if  $pk \geq 0$   
else  $pk + 2\Delta y$

(iii)  $pk + 1 = pk + 2\Delta x - 2\Delta y$  if  $pk \leq 0$ ,  
else  $pk - 2\Delta y$

(iv)  $pk + 1 = pk + 2\Delta x$

(j) 3D Animation is done using .....

(CO5, BL-3)

(i) Flash

(ii) Page Maker

(iii) Maya

(iv) None of the above

(k) The clipping algorithm is used for polygon clipping : (CO3, BL-1)

(i) Liang-Barsky

(ii) Sutherland Hodgeman

(iii) Both (i) and (ii)

(iv) None of the above

(l) Which type of animations uses stop motion techniques ? (CO5, BL-3)

(i) Production

(ii) HTML

(iii) Frame-based animation

(iv) All of the above

2. Attempt any *four* of the following : 3 each

(a) Demonstrate plasma display in detail.

(CO1, BL-1)

(b) Explain down the two disadvantages of DDA line Drawing Algorithm over the Bresenham's. (CO2, BL-1)

(c) What do you mean by clipping ? Explain inside test. (CO3, BL-2)

(d) Explain principles of Animation. (CO5, BL-2)

(e) Define the concepts of translation, reflection and shearing in geometric transformations.

(CO4, BL-2)

**Section—B****(Long Answer Type Questions)**

3. Attempt any *two* of the following : 6 each

(a) Using Bresenham's line Drawing Algorithm, determine the pixel coordinates for drawing a line from point (1, 1) to Point (8, 7). Show all steps involved in the algorithm, including the calculation of the decision parameter.

(CO2, BL-3)

(b) Define animation and elaborate on the concepts of scripting and procedural animation system in detail. (CO5, BL-1)

(c) Explain the Cohen-Sutherland line clipping algorithm with an example. (CO3, BL-3)

4. Attempt any *two* of the following : 6 each

(a) Design a program to fill a polygon using Boundary filling Algorithm. (CO3, BL-6)

(b) What is the difference between beam penetration method and shadow mask method ? (CO1, BL-2)

- (c) Rotate a triangle placed at A(0, 0), B(1, 1) and C(5, 2) by an angle  $45^\circ$  with respect to origin.  
(CO4, BL-5)
5. Attempt any *two* of the following : 6 each
- (a) Explain the concept of 3D transformation about an arbitrarily point. (CO4, BL-3)
- (b) If a line is drawn from (2, 3) to (6, 15) with use of DDA. How many points will needed to generate such lines ? (CO2, BL-3)
- (c) What is open GL and what are its primary applications in the field of computer graphics ? (CO5, BL-2)