

Roll No. ....

**97678**

**BCA 5th Semester  
Examination – December, 2022**

**COMPUTER GRAPHICS**

Paper : BCA-302

Time : Three hours ]

[ Maximum Marks : 80

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

**Note:** Question No. 1 is compulsory. Attempt four questions by selecting one question from each Unit. All questions carry equal marks.

1. (a) What is random scan system ?
- (b) What is meant by coordinate systems transformation ?
- (c) What is 2D viewing transformation ?
- (d) What is interactive computer graphics ? State its relevance.
- (e) What are viewing coordinates ? Illustrate.
- (f) What is quadratic surface ?

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- (g) What is 3D shearing ?  
 (h) Why Bresenham's line algorithm is preferred over DDA line algorithm ?  $2 \times 8 = 16$

**UNIT - I**

2. (a) What do you mean by flood-fill algorithm ? What is its relevance ? Illustrate. 6  
 (b) What steps are required to plot a line whose slope is between 0 and 30° using Bresenham's method ? Indicate which raster locations would be chosen by Bresenham's algorithm when scan-converting a line from screen coordinate (2, 5) to screen coordinate (6, 10). 10

3. Explain the following :

- (a) Ellipse Algorithm 8  
 (b) Plasma Displays 8

**UNIT - II**

4. (a) What is Cyrus-beck Line Clipping algorithm ? Illustrate through a suitable example. 7  
 (b) Find the normalization transformation that maps a window whose lower left corner is at (2, 3) and upper right corner is at (7, 10) onto : 9  
 (i) A viewport that is the entire normalized device screen and  
 (ii) A viewport that has lower left corner at (0, 0) and upper right corner (4, 4).

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5. Explain the following :  
 (a) 2D Shearing Transformation 8  
 (b) Sutherland-Hodgeman polygon clipping algorithm 8

**UNIT - III**

6. (a) What are polygon-rendering methods ? Which method is most popular ? Justify your answer. 8  
 (b) What are Bezier surfaces ? How are these represented ? Illustrate their relevance in graphics. 8

7. Explain the following :

- (a) Hermite Curve 8  
 (b) Illumination Models 8

**UNIT - IV**

8. (a) What is general projection transform ? How is it significant ? Illustrate. 8  
 (b) What is meant by viewing pipeline ? Illustrate. 8  
 9. Explain the following :  
 (a) 3D Composite Transformations 8  
 (b) 3D Reflection 8

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