

(b) What is meant by viewing pipeline ? Illustrate. 8

9. Explain the following :

(a) Composite Transformations 8

(b) 3D Shearing 8

Roll No.

97678

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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 interactive computer graphics ? State its relevance. $2 \times 8 = 16$
- (b) What is random scan system ?
- (c) Why Bresenham's line algorithm is preferred over DDA-line algorithm ?
- (d) What is meant by coordinate systems transformation ?
- (e) What is quadric surface ?

- (f) What are viewing coordinates ? Illustrate.
- (g) What is Cyrus-beck line clipping algorithm ?
- (h) What is flickering ? What causes flickering ?

UNIT - I

- 2. (a) What are raster-scan systems ? how do these work ? Illustrate. 7
- (b) What is scan conversion ? What steps are required to plot a line whose slope is between 0 and 45° using Bresenham's method ? Indicate which raster locations would be chosen by Bresenham's algorithm when scan-converting a line from screen coordinate (2,3) to screen coordinate (7,12). 9
- 3. (a) What are plasma displays ? How do these work ? Illustrate. 6
- (b) What is flood-Fill algorithm ? What is its relevance ? Illustrate. 5
- (c) What is mid-point circle algorithm ? How does it work ? Illustrate. 5

UNIT - II

- 4. (a) What is 2D composite transformation ? Illustrate through a suitable example. 6

- (b) What is 2D viewing transformation ? Find the normalization transformation that maps a window whose lower left corner is at (1,2) and upper right corner is at (5,8) onto. 10
 - (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 $\left(\frac{1}{2}, \frac{1}{2}\right)$

5. Explain the following :

- (a) Cohen-Sutherland line-clipping algorithm 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 surface ? How are these represented ? Illustrate their relevance in graphics. 8
- 7. Explain the following :
 - (a) Hermite Curve 8
 - (b) Basic Illumination Models 8

UNIT - IV

- 8. (a) What is general projection transform ? How is it significant ? Illustrate. 8