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 quadric surface ?

(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 (½, ½).

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