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BCA 5th Semester (Full & Re-appear)

Examination, December-2024

Computer Graphics

Paper : BCA-302

Time allowed : 3 hours]

[Maximum marks : 80

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 2D viewing transformation?
 - (b) What is 3D shearing?
 - (c) What is random scan system?
 - (d) Why Bresenham's line algorithm is preferred over DDA line algorithm?
 - (e) What are viewing coordinates? Illustrate.
 - (f) What is quadric surface?

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- (g) What is meant by coordinate systems transformation?
- (h) What is interactive computer graphics? State its relevance. $8 \times 2 = 16$

Unit-I

2. (a) What is 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

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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 (7,9) 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 ($\frac{1}{2}$, $\frac{1}{2}$).

5. Explain the following :

(a) 2D Shearing Transformation 8

(b) Sutherland-Hodgeman polygon clipping algorithm 8

Unit-III

6. (a) What are Bezier surfaces? How are these represented? Illustrate their relevance in graphics. 8
- (b) What are polygon-rendering methods? Which is most popular? Justify your answer. 8
7. Explain the following :
- (a) Hermite Curve 8
- (b) Illumination Models 8

Unit-IV

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