B.C.A., 5th Semester Examination.

February-2022

COMPUTER GRAPHICS

(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. (i) What is meant by coordinate systems transformation ?

   (ii) What is interlacing ? State its relevance.

   (iii) What causes flickering ?

   (iv) What is flood-fill algorithm ?

   (v) What is raster scan ?

   (vi) What are viewing coordinates ? Illustrate.

   (vii) What is quadric surface ?

   (viii) What is window-to viewpoint coordinate transformation ? $8 \times 2 = 16$





Unit - I

2. (i) What is Computer Graphics ? Indicate the importance of this discipline in Computer Science by giving suitable examples. 6

   (ii) What steps are required to plot a line whose slope is between 0 and $45^{\circ}$ using Bresenham's method ? Indicate which raster locations would be chosen by Bresenham's algorithm when scan-converting a line from screen coordinate (1, 2) to screen coordinate (7, 8). 10

3. Explain the following :

   (i) Midpoint Circle algorithm 8

   (ii) Random Scan Systems 8

Unit - II

4. (i) Prove that two two-dimensional rotations about the origin commute : 6

   $R_1 R_2 = R_2 R_1$

(ii) What do you mean by transformation ? Describe the transformations used in magnification and reduction with respect to the origin. Find the new coordinates of the triangle P(1,1), Q(4, 3), R(0, 1) after it has been : 10

(a) Magnified thrice its size and

(b) Reduced to half its size.

5. Explain the following :

(i) Cohen-Sutherland Line Clipping Algorithm 8

(ii) Cyrus-Beck Line Clipping Algorithm 8

## Unit - III

6. (i) What are Bezier surfaces ? How are these represented ? Illustrate their relevance in graphics. 8

(ii) What are polygon-rendering methods ? Which method is most popular ? Justify your answer. 8