

B4.4-R4 : COMPUTER GRAPHICS AND MULTIMEDIA**NOTE :**

1. Answer question 1 and any FOUR from questions 2 to 7.
2. Parts of the same question should be answered together and in the same sequence.

Total Time : 3 Hours**Total Marks : 100**

1. (a) Explain rendering in computer graphics.
 (b) What is 3D rotation in Geometrical Transformation ? Describe.
 (c) Draw a block diagram for JPEG encoder and decoder.
 (d) Define clipping in computer graphics. List down some of its applications.
 (e) What are two types of scanning or travelling of beam in Raster Scan ? Also, discuss the advantages of raster scan.
 (f) Prove that 2D Scaling transformations are commutative i.e., $S_1 S_2 = S_2 S_1$
 (g) Define interactive and passive graphics. (7x4)

2. (a) What is shading ? Discuss the following shading methods.
 (i) Constant Intensity Shading
 (ii) Gouraud shading
 (iii) Phong Shading
 (b) Write Cohen Sutherland Line Clipping algorithm. (9 + 9)

3. (a) Explain the working of Cathode Ray Tube (CRT) with a suitable diagram.
 (b) Describe the working of Tablet and Light Pen.
 (c) Let Starting and Ending position of the line are (1, 1) and (8, 5). Find intermediate points using Bresenham's Line Algorithm. (6+6+6)

4. (a) Plot 6 points of a circle using Bresenham Algorithm, when radius of circle is 10 units. The circle has centre (50, 50).
 (b) Prove that 2D rotations about the origin are commutative i.e. $R_1 R_2 = R_2 R_1$ where R_1 and R_2 are rotation matrices. (9+9)

5. (a) Rotate a line AB whose endpoints are A(2, 5) and B(6, 12) about origin through a 30° clockwise direction and compute its new coordinates.
 (b) A point has coordinates in the x, y, z direction i.e., (5, 6, 7). The translation is done in the x-direction by 3 coordinate and y-direction. Three coordinates and in the z-direction by two coordinates. Shift the object. Find coordinates of the new position. (9+9)

6. (a) Discuss perspective projection and its types.
(b) Difference between Spline, B-Spline and Bezier Curves. (9+9)
7. Write short notes on following :
(a) Application of Computer Graphics
(b) MPEG
(c) Scan-line polygon fill algorithm (6+6+6)

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