B4.4-R4: COMPUTER GRAPHICS AND MULTIMEDIA SYSTEMS

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.**

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

1.

a) What is Kinematics and dynamics in terms of animation?
b) What are the steps needed to rotate an object in 3D about an axis that is not parallel to one of the co-ordinate axis?
c) Identify the common problems with interpolated shading techniques.
d) What do you mean by Multimedia Authoring? What are the different types of Multimedia Authoring tools?
e) How can we determine if a point is inside a polygon or not.
f) What is the objective of image compression? How do we measure the goodness of an image compression technique?
g) Name three factors, which influence illumination of an object point due to spherical reflection.

(7x4)

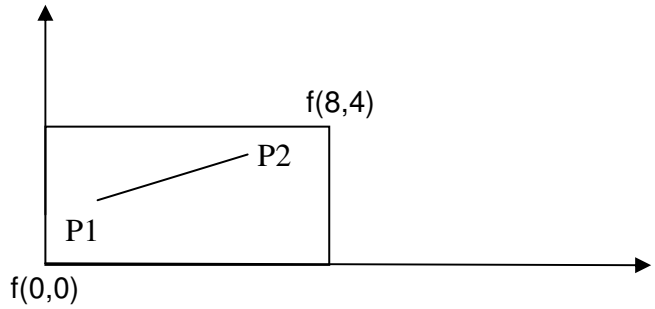
2.

a) Compare Random Scan Display with Raster Scan Display.
b) Using both simple DDA and Bresenham's algorithm find out the list of the activated pixels for the line from (0,0) to (5,5).

(6+12)

3.

a) Define window and viewport. Explain mid-point subdivision algorithm.
b) Consider the line P1(1,1) to P2(7,3) clipped to the rectangular window shown in below given figure. Apply Cyrus-Beck algorithm and check whether given line is entirely visible or clipped.



(9+9)

4.

a) Show that scaling followed by rotation in 2D is equivalent to shearing transformation.
b) Define Orthographic Projection. Explain "Parallel Projection".
c) Compare region filling with scan-line filling. Explain boundary fill algorithm.

(6+6+6)

5.

a) Given that P0[1,1], P1[2,3], P2[4,3] and P3[3,1] are the vertices of a Bezier polygon, determine seven points of Bezier curve.

b) Write short note on look-up table based animation technique.

c) What is rendering? Explain Gouraud Shading.

(6+6+6)

6.

a) Write a short note on "Video Conferencing".

b) Explain the concept of loss-less predictive coding of audio signal.

c) What is Virtual Reality? Explain various ingredients of virtual reality systems.

(6+6+6)

7.

a) Describe briefly with an example Cohen and Sutherland's polygon clipping algorithm against a rectangular window.

b) Write expressions for HSV color values obtained from RGB. State two differences between the uses of these two color models.

(10+8)