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.**

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

1.

a) What is the main difference between the DDA algorithm and Bresenham's line drawing algorithm?

b) How is a Plasma display different from the LCD display?

c) How sound card processes WAV file?

d) Draw a rough sketch of a cubic Bezier Curve given the points P1(10,10), P2(50,10), P3(110,60), P4(70,20).

e) What is the difference between diffused and specular reflections?

f) Obtain the 3x3 transformation matrix for translating a point by (-1, 2). Calculate the inverse of this matrix and show that the result is a matrix which translates a point by (1, -2).

g) Illustrate the JPEG encoding technique with block diagram.

(7x4)

2.

a) Develop the Cubic Bezier Curve equation given the x,y coordinates of the points A1,A2,A3,A4.

b) Show which pixels will be selected for drawing a line between (60,10) and (67,14) using the Bresenham's line drawing method.

(10+8)

3.

a) What is the need of homogeneous coordinates? Define affine transformation? Distinguish between uniform scaling and differential scaling? What is fixed point scaling?

b) A Polygon has four vertices located at A (20, 10), B (60, 10) C(60, 30) and D(20, 30). Indicate a transformation matrix to double the size of the polygon with point A located at the same place?

c) How can the light pen differentiate between two points on the screen when both have the same color/intensity?

(7+5+6)

4.

a) Differentiate between Intra-Object and Inter-Object synchronization.

b) How are characters of various fonts generated on the screen?

c) Using the mid point subdivision method, show which portion of the line P(200,800) – Q(1000,250) will be visible in the clipping window M,N,P,Q with M being (0,0) and P being (300,300).

(6+6+6)

5.

a) Using a simple object illustrate how a 3D object is presented using perspective projection.

b) Describe DDA Algorithm. Write down the drawback of DDA algorithm.

c) What do you mean by interlacing?

(8+7+3)

6.

a) How WaveTable synthesizer is different from FM synthesizer and how MIDI file is different from digital audio? Describe the different components in the MIDI protocol.

b) How can we simulate acceleration and constant velocity in animation?

c) Explain Boundary Fill Algorithm.

(7+5+6)

7.

a) Derive the Bresenham's circle drawing algorithm to draw quadrant of a circle with center at the origin and moving from (R,O) as x axis to (O,R) on y axis.

b) Given a triangle A(10,10), B(50,40), C(80,30) work out a transformation to rotate it about the Point B by 30° (anti clock wise).

c) What do you understand by multimedia authoring? What tools are used for this?

(8+6+4)