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 are the different ways of specifying spline curve?
b)   What is color depth?
c)   How sound card processes WAV file?
d)   What are the problems of putting an animation on the web?
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)   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)   Draw a circle in first quadrant having center (0, 0) and radius 5.

                                                                                       (7+5+6)

3.
a)   Differentiate between Intra-Object and Inter-Object synchronization.
b)   Write a short note on "Cathode Ray Tube".
c)   Name the major component of a graphical interface and what are its features?

                                                                                       (6+6+6)

4.
a)   Using a simple object illustrate how a 3D object is presented using perspective projection.
b)   What is pseudo animation? What is Sprite?
c)   What do you mean by interlacing?

                                                                                       (8+7+3)

5.
a)   Give equations for RGB to HSV Transformation.
b)   Give the JPEG encoding and decoding block diagram.
c)   What steps are required to fill a region using Flood fill algorithm?

                                                                                       (7+5+6)

6.

a) What are the important properties of Bezier Curve? Differentiate between interpolation splines and approximation splines? What do you mean by parabolic splines? What is cubic spline?

b) Elucidate Painter's Algorithm.

c) State the Differences Between DDA Line Drawing Algorithm and Bresenhams Line Drawing Algorithm?

(8+7+3)

7.

a) Prove that two 2-D scaling transformation commute.

b) What are the applications of Rotation about an Axis parallel to a coordination axis and also find transformation matrix for it?

(8+10)