15-06-2026 SE CSE-AIML SEM-III C SCHEME CG QP CODE: 20014713

(3 Hours) **Total Marks 80**

N.B: 1) Question number 1 is compulsory.
2) Attempt any three out of the remaining.
3) Assume suitable data if necessary and justify the assumptions.
4) Figures to the right indicate full marks.

1	a)	Explain the representative uses of computer graphics with suitable examples.	**[05]**
	b)	Apply X-shear followed by Y-shear transformations to a square ABCD with vertices A(0, 0), B(4, 0), C(4, 4), and D(0, 4), where the shear factors in both X and Y directions are 0.5. Determine the final coordinates of the transformed square.	**[05]**
	c)	Analyze the growth pattern of the Koch curve and explain how its length changes with each iteration.	**[05]**
	d)	Describe the role of deformation in animation.	**[05]**
2	a)	Explain the Digital Differential Analyzer (DDA) algorithm for line drawing. Derive the algorithm and illustrate it by finding the intermediate points t o draw a line from (2, 3) to (10, 7). Analyze the advantages and limitations of the DDA algorithm.	**[10]**
	b)	Differentiate between parallel and perspective projection. Analyze their advantages, limitation.	**[10]**
3	a)	Evaluate the importance of homogeneous coordinates in computer graphics. Explain how they simplify translation, rotation, and scaling.	**[10]**
	b)	Construct a Bezier curve using given control points. Explain the properties of Bezier curves and analyze their limitations.	**[10]**
4	a)	Explain the Depth Buffer method for visible surface detection. Illustrate the algorithm with an example and analyze its advantages and limitations.	**[10]**
	b)	Explain the Cohen-Sutherland line clipping algorithm. Illustrate the step-by-step procedure to clip a line against a rectangular clipping window.	**[10]**
5	a)	Explain composite transformation for a 2D object involving scaling, rotation, and translation. Construct the composite transformation matrix.	**[10]**
	b)	Derive and apply the window to viewport transformation in Computer Graphics.	**[10]**
6	a)	Compare Boundary Fill and Flood Fill algorithms.	**[05]**
	b)	Explain traditional animation techniques with suitable examples.	**[05]**
	c)	Define aliasing in computer graphics. Explain its causes and discuss any two antialiasing techniques.	**[05]**
	d)	What is scan conversion? Explain its role in computer graphics.	**[05]**

****

X525Y4C91DCX525Y4C91DCX525Y4C91DCX525Y4C91DC