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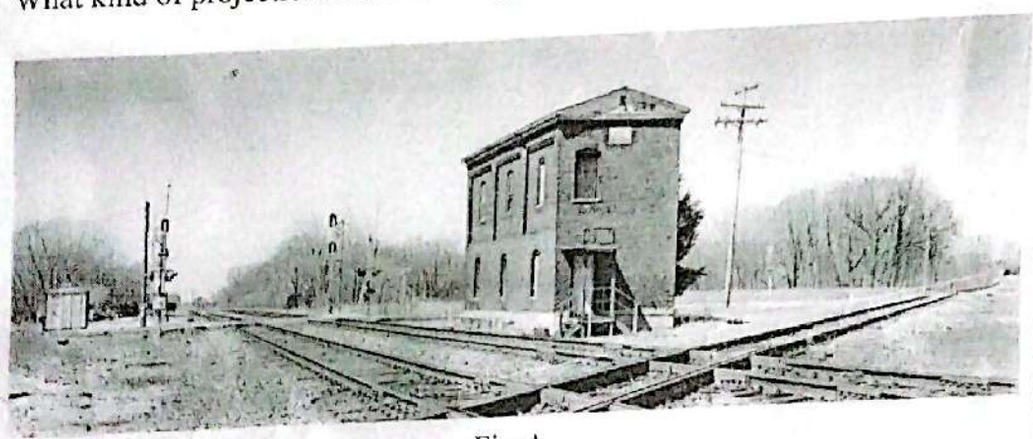
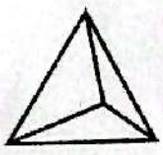
Daffodil International University

Faculty of Science & Information Technology
Department of Computer Science & Engineering
Final Examination, Fall 2025
Course Code: CSE421, Course Title: Computer Graphics
Level: 4 Term: 3 Batch: 61

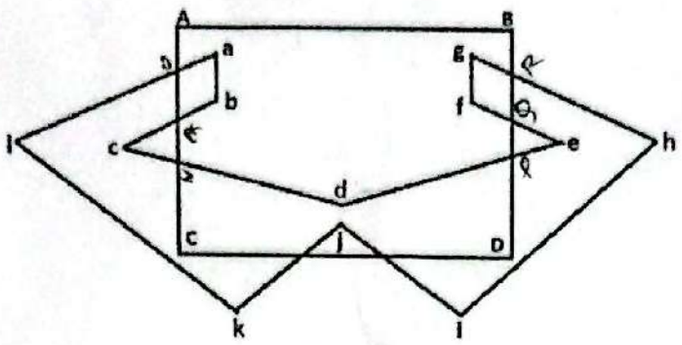
Time: 02:00 Hrs **Marks: 40**

Answer ALL Questions

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

1.	(a)	What kind of projection is shown in figure A? **Describe** each of with examples.  Fig:A	**[4+4]**	**CO1**
	(b)	A small e-learning company wants to create a 20-second animated clip explaining how a plant grows. The designer has completed the rough sketches but is unsure how to proceed with converting them into smooth animation. **Explain** which steps of the animation sequence design process the designer should follow next and how those steps will help transform the sketches into a smooth final animation.		
2.		A triangle in 3D space has four vertices at A(2, 3, 0), B(4, 3, 0), C(3, 5, 0) and D(3, 4, 5). a) Apply a scaling transformation with factors Sx = 2, Sy = 1.5, Sz = 1 about the origin. Calculate the new coordinates of all vertices. b) Then rotate the scaled triangle by 90° about the Z-axis. Show the transformation matrix and compute final vertex positions. c) Finally, translate the result by vector T(3, -2, 4). Write the composite transformation matrix and verify your final coordinates. 	**[8]**	**CO2**

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3.		In the figure B below, ABCD represents the clipping window, and abcdefghijkl is the subject polygon.  Fig: B (i) **Apply** the Sutherland–Hodgman polygon clipping algorithm to create the clipped polygon. (ii) **Apply** the Weiler–Atherton polygon clipping algorithm to create the clipped polygon. (iii) Analyze both algorithms and suggest which algorithm is appropriate for this clipping scenario and justify your answer with proper reasoning.	14	CO3
4.		Consider a rectangular window with its lower left-hand corner at L (25, 45) and upper right-hand corner at R (75, 90). Identify Xmin, Ymin, Xmax, Ymax and draw the following line segments: i) Line segment AB, where A(30, 40) and B(60, 95) ii) Line segment CD, where C(50, 30) and D(50, 80) iii) Line segment EF, where E(78, 50) and F(55, 100) iv) Line segment GH, where G(20, 35) and H(20, 65) v) Line segment IJ, where I(17,70) and J(37,85) Now, identify line categories of the lines and apply line clipping algorithms find out clipped points.	[10]	CO3