

C1-R4 : ADVANCED COMPUTER GRAPHICS

NOTE :

1. Answer question 1 and any FOUR questions from 2 to 7.
2. Parts of the same question should be answered together and in the same sequence.

Time : 3 Hours

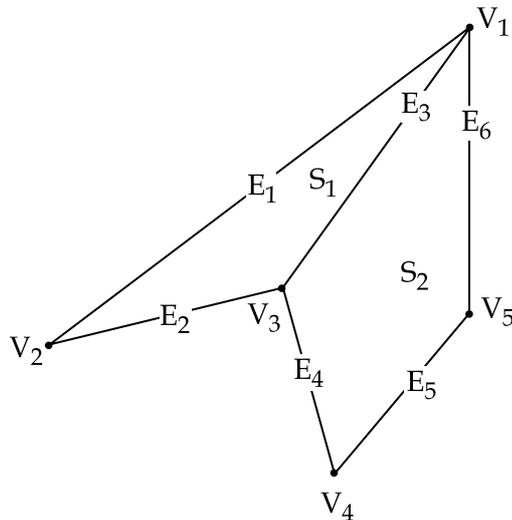
Total Marks : 100

1. Answer all the following questions.
 - (a) Explain Rubber Band method for picture construction.
 - (b) Define composite transformation in computer graphics. What is the advantage of having composite transformation ?
 - (c) Derive a composite transformation matrix for 2D reflection about an arbitrary line $y = mx + b$. Use the matrix to reflect triangle (2, 4), (4, 6), (2, 6) about line $y = 0.5(x + 4)$.
 - (d) Explain polygon mesh representation of 3D models. List out its advantages and disadvantages.
 - (e) What is Warn model in computer graphics ?
 - (f) List out the problems with interpolated shading.
 - (g) Briefly explain animation file formats. (7×4=28)

2.
 - (a) Write the algorithm of Cohen Sutherland Line Clipping. Let R be the rectangular window whose lower left-hand corner is at L (- 3, 1) and upper right-hand corner is at R (2, 6). Apply the algorithm and clip the line segment A (- 4, 2), B (- 1, 7) against R.
 - (b) Explain positioning techniques used for interactive graphics. Discuss various positioning constraints. (10+8)

3.
 - (a) Write the set of transformations to convert the window or world coordinate area into the viewport or screen coordinate area.
 - (b) What is Projection ? Differentiate between parallel projections and perspective projection.
 - (c) Discuss different types of oblique parallel projections with suitable diagrams. (6+8+4)

4. (a) Define a Bezier curve. Explain its characteristics.
 (b) How to represent polygon surfaces using polygon tables? Create polygon tables to represent the following surface.



(10+8)

5. (a) Discuss Z-buffer algorithm for visible line determination. Write down its advantages and disadvantages.
 (b) Discuss Phong shading model.
 (c) Explain area sub division method for visible surface detection. (8+5+5)
6. (a) What is half tone in computer graphics?
 (b) What are the factors that affect illumination in computer graphics? Explain basic illumination models.
 (c) What are different animation techniques? Explain. (4+7+7)
7. (a) Explain the two primary color models RGB and CMYK. Compare both the models.
 (b) What is coherence? Explain different types of coherence used in visible surface detection.
 (c) Explain octree structure used for 3D representation. Discuss its advantages and disadvantages. (6+6+6)

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