(Time: 2½ hours)

Total Marks: 75

N. B.: (1) **All** questions are **compulsory**.
    (2) Make **suitable assumptions** wherever necessary and **state the assumptions** made.
    (3) Answers to the **same question** must be **written together**.
    (4) Numbers to the **right** indicate **marks**.
    (5) Draw **neat labeled diagrams** wherever **necessary**.
    (6) Use of **Non-programmable** calculators is **allowed**.

1. **Attempt _any three_ of the following:**   **15**
a. List and explain the graphic devices used in computer graphics.
b. How does a mechanical mouse work?
c. Write short note on vector display of computer graphics.
d. Explain Digital Differential Analyzer (DDA) algorithm.
e. Explain Sutherland Hodgeman algorithm for polygon clipping with example.
f. Use the Cohen Sutherland algorithm to clip line P1 (70,20) and p2 (100,10) against a window lower left hand corner (50,10) and upper right hand corner (80,40).

2. **Attempt _any three_ of the following:**   **15**
a. What is transformation? Explain translation transformation with the help of example.
b. Describe homogeneous coordinate system for translation and scaling.
c. Magnify the triangle with vertices A (0, 0), B (1, 1) and C (5, 2) to twice its size while keeping C (5, 2) fixed.
d. Explain the matrix representation of 3D translation scaling.
e. Write a note on 2 point perspective transformation.
f. Distinguish between cavalier and cabinet projection.

3. **Attempt _any three_ of the following:**   **15**
a. Short note on Canonical View Volume (CVV).
b. Explain combined transformation matrix for viewing in detail.
c. Write short note on photometry in detail.
d. What are the various parameters used in color appearance.
e. Explain LMS color space in detail.
f. Describe the transport equation of light in brief.

4. **Attempt _any three_ of the following:**   **15**
a. What is visible surface determination? Explain different methods of visible surface determination.
b. Explain object image space method for efficient visible surface algorithm.
c. Explain parametric representation of an ellipse.
d. What is z-buffer algorithm used for? List t advantages and disadvantages.
e. Briefly explain Painters algorithm with example.
f. Write short note on quadratic surface.

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5. **Attempt *any three* of the following:** **15**
a. Explain any two principals of animation with suitable example.
b. What is key framing? What are the advantages of key framing?
c. Explain different digital image file formats.
d. What is image compression? Explain lossless compression technique.
e. What is image enhancement? Explain frequency domain method of image enhancement.
f. Explain the concept of median filtering in detail.

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