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) Define Orthographic Projection. Explain three types of perspective projections.
   b) Define following terms:
      i) Aliasing
      ii) Overstrike
      iii) Picket fence
   c) Define Cubic Bezier Curve.
   d) Why are hidden surface algorithms needed? How does Z-buffer algorithm determine which surfaces are hidden?
   e) Describe World Coordinate System (WCS) and Normalized Device Coordinate System (NDCS)
   f) Define NTSC, PAL and HDTV
   g) What is Kinematics and Dynamics in terms of Animation?

   (7x4)

2.
   a) Compare Random Scan Display with Raster Scan Display.
   b) Prove that two 2-D scaling transformation commute.
   c) Perform 45 degree rotation of a triangle A(0, 0), B(1, 1), C(5, 2) about the origin. Perform 45 degree rotation of the above triangle about the point P(-1, -1).

   (6+4+8)

3.
   a) Define Homogeneous co-ordinates and justify the significance of it.
   b) Use the Cohen-Sutherland algorithm to clip line with points p1(70, 20) – p2(100, 10) against a window a(50, 10), c(80, 40).
   c) What steps are required to fill a region using the boundary-fill method?

   (6+6+6)

4.
   a) List out the properties of Bezier Curve.
   b) Indicate which raster locations would be chosen by Bresenham’s algorithm when scan converting a line from screen co-ordinate (1, 1) to screen coordinate (8, 5)?
   c) Mention Advantages and disadvantages of Z-buffer algorithm.

   (8+5+5)

5.
   a) Give equations for RGB to HSV Transformation.
   b) Discuss the problems with Interpolated Shading Techniques.
   c) Differentiate between Gouraud and Phong Shading.

   (8+4+6)
6. 
   a) Given P0[3,3], P1[6,9], P2[12,9] and P3[9,3], the vertices of a Bezier polygon, determine seven points of Bezier Curve.
   b) Find the normalization transformation that maps a window whose lower left corner is at (1,1) and upper right corner is at (3,5) onto
      i) a view port that is the entire normalized device screen.
      ii) a view port that has lower left corner at (0,0) and upper at (½,½).

7. 
   a) Define Motion Specification. Explain Direct Motion Specification and Goal Directed Systems.
   b) Differentiate between:
      i) Multimedia and Hypermedia
      ii) Lossy and Lossless compression
      iii) Morphing and Tweaking
   c) What is MIDI file?