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) Briefly explain polygon clipping.
   b) Describe Hermit and Bezier curves with examples.
   c) Define subdivision of curves using Chaikin’s algorithm with an example.
   d) What is Appel’s algorithm and where is it used?
   e) What is halftone and explain different halftone pattern in 3 × 3 image block
   f) What are the differences between HSV and RGB color model? Convert HSV to RGB and vice versa.
   g) What are the different methods for controlling the animation? Describe each of them briefly.
   (7×4)

2.
   a) How many principles are there in computer animation? Describe each of them.
   b) What are the specifications for motions in animation?
   c) What is Z-Buffering?
   (10+5+3)

3.
   a) Explain YIQ and HLS color model.
   b) Briefly describe Phong illumination model.
   c) Explain the role of key-frame in animation.
   ([4×2]+7+3)

4.
   a) Describe the logical input devices.
   b) Describe different 3D geometric transformation techniques. Translate a triangle with vertices at original coordinates (10, 25, 5), (5, 10, 5), (20, 10, 10) by \( t_x=15, t_y=5, t_z=5 \). Then plot the \( x \) and \( y \) values of the original and resultant triangles, with approx locations of \( z \) values.
   (6+12)

5.
   a) What is CSG (Constructive Solid Geometry) with example? What are the application areas of CSG?
   b) What is space-portioning with the application in computer graphics? Explain about BSP (Binary Space Partition).
   c) What is raster animation? Describe the advantages and disadvantages of this method.
   (5+8+5)
6. 
   a) Define different cubic curves.
   b) Express the 3D geometric rotational matrices around X-axis, Y-axis & Z-axis. Also express the mirror transform over X-axis.
   c) Define perspective projection. Describe different types of perspective projection with example. 

(3+[6+2]+7) 

7. 
   a) Describe the effect of illumination in graphics.
   b) What is ray tracing method and why it is used?
   c) What is Painter algorithm? Why it is used? What are tested during the algorithm?
   d) How boundary is represented in solid modeling, explain it.

(2+5+7+4)