1. a) Write the steps for clipping a polygon with respect to a rectangular window.
b) How is Bezier surface formed? Write the parametric vector function for Bezier surfaces.
c) Describe CSG representation for solids.
d) What do you mean by back face culling? Where do we need it?
e) Explain fractals and their use in computer animation.
f) How can we use forward kinematics to animate an object?
g) Describe the lump mapping of illumination.

2. a) Derive the basic matrix for hermite cubic spline and give the blending functions and their rough sketches.
b) Write the properties of B-spline curves which make it better than Bezier curves. Draw a rough sketch of Bezier curve with the control points $P_1, P_2, P_3, P_4, P_5, P_6, P_7$.

3. a) What are the various representation schemes for valid solids? Explain octree representation of solids.
b) Explain the method of ray-tracing for detecting visible surfaces.

4. a) Write the steps for rotating a solid around any axis which is not parallel to any of the principal co-ordinate axis and does not pass through origin.
b) Using Cyrus Beck algorithm find the position of the visible line in the rectangular window. The line is obtained by joining (75, 500) and (500, 1500); the window is having vertices (100, 100) (1000, 100) (100, 1000) & (1000, 1000).

b) Describe briefly the Gouraud and Phong shading model. Which of the two gives better results and why?

6. a) Describe inverse kinematics using Jacobians.
b) Discuss Euler angle representation.
c) What do you mean by perception of motion?

7. a) Describe flocking system technique for animation.
b) Discuss sin-interpolation method as applied to animation techniques.