(3 Hours)   [Max Marks 80

N.B.
(1) Question no. 1 is compulsory.
(2) Attempt any 3 from the remaining questions.
(3) Assume suitable data if necessary and justify.
(4) Figures to right indicate full marks.

Q1(a)	With reference to 2D transformation, Derive the matrix for scaling operation on an object, with reference to pivot point. Apply it on a triangle ABC , A(0,0),B(1,2) , C(3,2) to double its size. The point C (3, 2) should remain fixed.	10
Q1(b)	Specify the different steps involved in the design of Animation sequence and explain.	10
Q2(a)	Explain the midpoint subdivision line clipping algorithm for 2 dimensions.	10
Q2(b)	Generate at least 5 points on a 2D Bezier curve with control points A(1,1), B(5, 5) C(7,2) D(10,6)	10
Q3(a)	Explain in details the logical classification of input devices.	10
Q3(b)	With reference to 2D transformations prove that the multiplication of transformation matrices for each of the following sequence of operations is commutative. i. Two successive rotations. ii. Two successive scaling.	10
Q4(a)	Compare the parallel and perspective projection.	10
Q4(b)	Write the matrices for rotation of a 3D object about X axis, Y axis and Z axis. Rotate a pyramid with base ABCD and apex E about Y axis by 90 degrees. A(0,0,0) , B(10,0,0), C(10,0,10) D(0,0,10), E(5,20,5)	10
Q5(a)	Explain the Z-buffer algorithm and Depth sort algorithm for hidden surface removal.	10
Q5(b)	Write a detailed note on octree and binary space partitioning trees.	10
Q6	Write short notes on i) Color Models. ii) Fractal curves	20