



- Notes :
1. All questions carry equal marks.
 2. Due credit will be given to neatness and adequate dimensions.
 3. Assume suitable data wherever necessary.

1. a) Explain various display devices and explain the working of image scanner in detail. **10**
- b) Explain scan conversion in brief. **6**

OR

2. a) Explain Raster color graphic and also explain in detail frame buffer related with it. **8**
- b) Explain working principle of CRT with suitable diagram. **8**

3. a) A polygon defined by vertices $P_1(1,1)$, $P_2(4,4)$, $P_3(4,1)$, $P_4(8,5)$, $P_5(1,5)$ using edge flag algorithm and edge fill algorithm. **8**
- b) Derive the Bresenham's line generation algorithm for generating a line $y = mx + c$ for $m \leq 1$ **8**

OR

4. a) Explain and develop bresenham's circle generation algorithm for first quadrant in clockwise direction and generate an arc for first octant of circle in clockwise direction using radius 8. **10**
- b) Rasterize a line $y = 2x + 10$ using DDA. **6**

5. a) Prove that reflection of square A (2, 2), B (4, 2), C (4, 4), D (2, 4) about $y = 0$ and the rotation of resulting square about 60° will not be same if the order of transformation is changed. **8**
- b) Write a short note on normalized device coordinate. **8**

OR

6. a) Reflection of triangle having vertices A (-8, 3), B (5, 4), C (-8, 6) about the line $y=2x+10$. **8**
- b) Explain the concept of segment with various operation performed on it. **8**

7. a) A polygon A (1, 1), B (11, 1), C (6, 6) clip a line from $P_1(0,2)$ to $P_2(10, 5)$ using Cyrus Back algorithm. **8**
- b) Explain endpoint outcode algorithm. Write a Cohen-Sutherland line clipping algorithm. **8**

OR

8. a) A clipping window ABCD is defined as A (0, 0), B (40, 0), C (40, 40) D (00, 40). clip a line from P (-10, 20) and Q (50, 10) using Mid-point subdivision algorithm. **8**
- b) Explain the working of Sutherland-Hodgman clipping algorithm. **8**

9. a) Derive transformation for rotation about an arbitrary axis in 3D. The arbitrary axis passes through points A [2 1 1 7], B [3 2 2 1]. **10**
- b) Explain various transformation of perspective projections. **6**

OR

10. a) Give the features and characteristics of B-spline and Bezier curves in detail. Also specify the difference between B-spline and Bezier curves. **10**
- b) Draw the Bezier curve for $P_0(3,4)$, $P_1(5,11)$, $P_2(9,15)$ and $P_3(15,20)$. **6**
