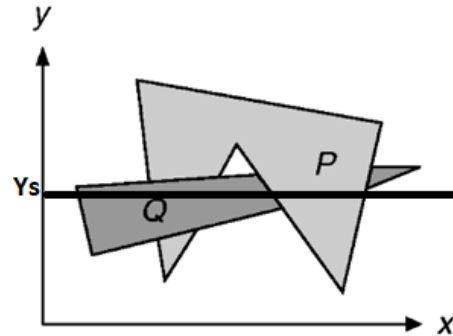


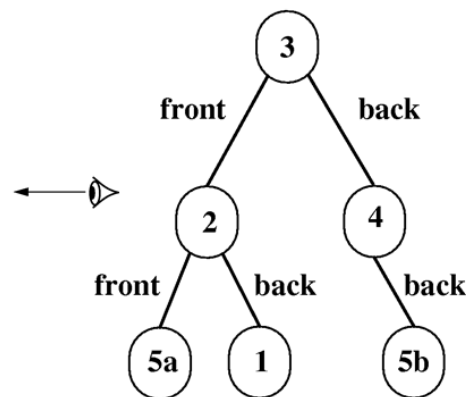
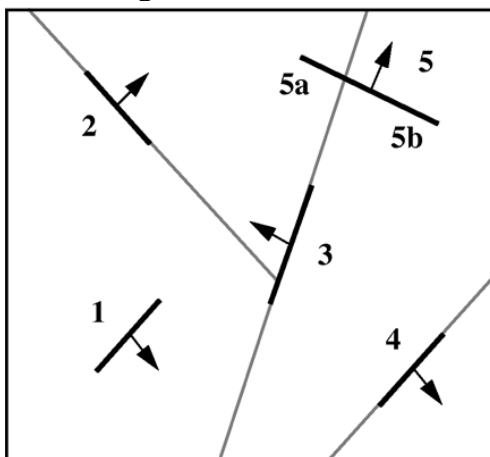
### CT-3

1. Give two examples, with convex hexagons, where back-face culling algorithm will remove (i) 3 edges, and (ii) 1 edge respectively. (04)

2. Suppose you are given two polygons **P** and **Q** as shown in the figure below. Explain how scan-line algorithm works for the scan-line  $Y_s$ . Your explanation should include the contents of active edge table, active polygon table, and how it is decided which polygon should be drawn for each segment of the scan-line. Draw the obscured portions of the edges of **P** and **Q** with dotted line if required for explanation. (10)



3. Write down the recursive function calls for displaying the lines shown in the figure below for the given BSP tree. The first few calls are given for reference. (06)



1. Display (3)
2. Display (2)
3. Display (1)
4. Draw 1
- ...

### CT-4

1. Which pixels should be colored for the scan conversion of ABC and DEF triangles (Fig. 1) and why? Explain according to the rules of scan conversion of filled polygon. (08)

Assumptions:

- i. ABC and DEF are filled triangles.
- ii. The pixels follow the rules of SRGP.

2. Explain the steps of clipping DEF if the corners of the clip rectangle are (6,2), (6,4), (7,4), (7,2) as shown in Fig. 1. Draw the clip rectangle and triangle separately without the Cartesian coordinates as required. Do not consider DEF as a filled triangle in this case. Note that, you do not need to calculate the coordinates of intersection points with the clip edges. Just show the process. (08)

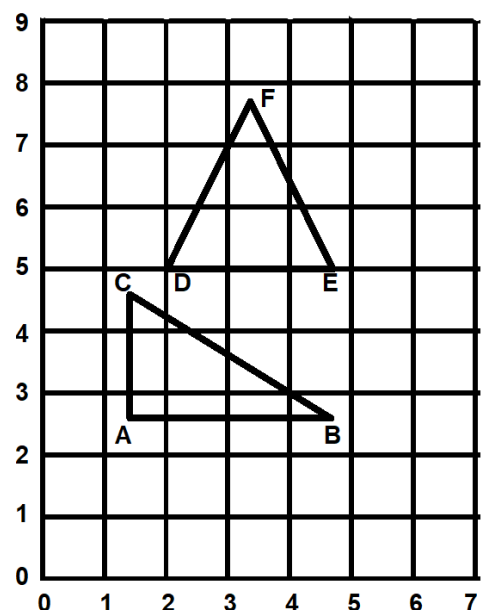


Fig. 1

3. When does the Cohen-Sutherland line clipping algorithm work well? Why? (04)