

Fig 6

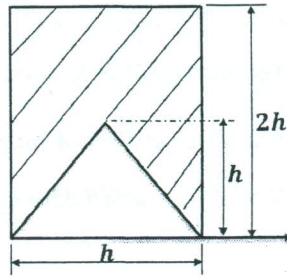


Fig 9

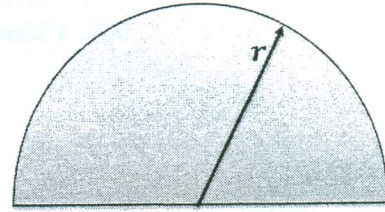


Fig 10

## Part 'B'

Answer any five of the following

5 X 10 = 50 M

11. Two cables AC & BC are supporting a rod OD and a weight 200 N is attached at point D as shown in figure 11. If the tensions in the two cables are 450 N in AC and 900 N in BC, find the resultant moment of all the three forces about the point O.
12. Two rollers A and B of weight 2 kN and 4 kN respectively rest on smooth inclined planes and connected by a rigid bar of negligible weight as shown in figure 12. Find the force F to be applied to roller A at 60° to the vertical as shown to keep the system in equilibrium.
13. A weight W kN is to be raised by means of the wedges A and B as shown in figure 13. If coefficient of friction is 0.25 for all the contiguous surfaces, determine the value of W if two forces  $P = 65 \text{ kN}$  are required to impend raising the block C. Neglect the weights of the three blocks.
14. Determine the location of the centroid of the plane area shown in figure 14 from top left corner.
15. Determine the moment of inertia of the built up section about X – axis shown in figure 15. All the dimensions are in cms.
16. Find forces in all the members of the truss shown in figure 16.
17. (a) Two identical blocks A and B are connected by a rod and they rest against vertical and horizontal planes respectively as shown in figure 17a. If sliding impends when the rod is at  $45^\circ$  with horizontal, determine the coefficient friction which is same for all the contiguous surfaces.
- 17 (b). Determine the radius of gyration of the area shown in figure 17(b) about the X axis. All dimensions are in cm.

