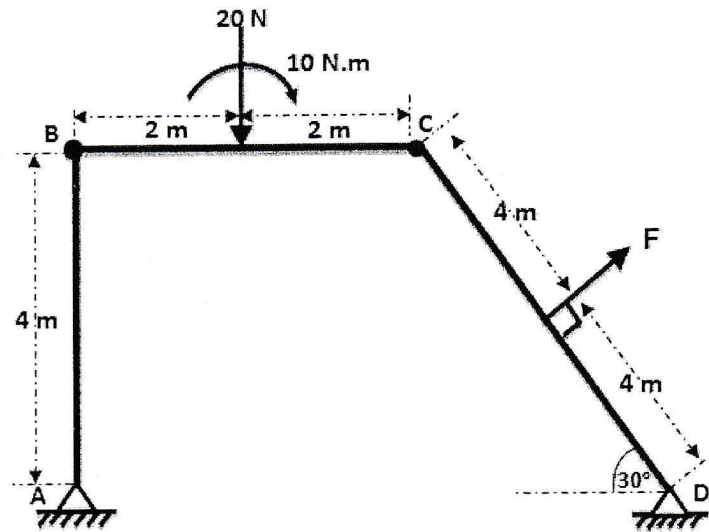




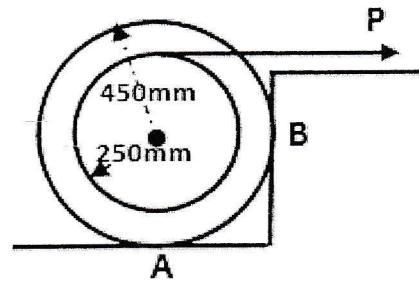
**Question (3):** (8 marks)

For the Shown frame, find the force in the weightless link AB, the reactions at C, D and the force F.



**Question (4):** (8 marks)

The spool of wire having a mass of 150 kg rests on the ground at A and against the wall at B. Determine the force P required to begin pulling the wire horizontally off the spool. The coefficient of static friction at point of contacts A and B is  $\mu_s = 0.25$ .



**Question (5):** (8 marks)

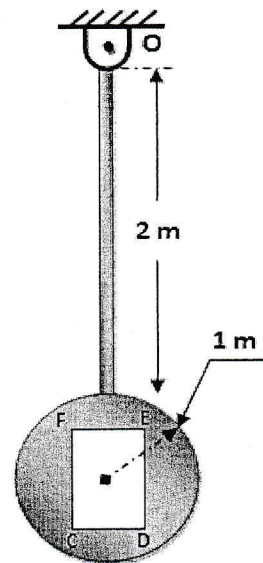
The Pendulum consists of a disk having a mass of  $10 \text{ kg/m}^2$  and a slender rod AB that has a mass of  $5 \text{ kg/m}$ . Determine the mass moment of inertia of the pendulum about an axis perpendicular to the page and passing through point O. The dimensions of the rectangular concentric hole CDEF are:

CD = 0.4 m and CF = 0.6 m

$$I_{G\text{Circle}} = \frac{1}{2}mr^2$$

$$I_{G\text{Rectangle}} = \frac{1}{12}m(a^2 + b^2)$$

$$I_{G\text{Rod}} = \frac{1}{12}ml^2$$



Good Luck