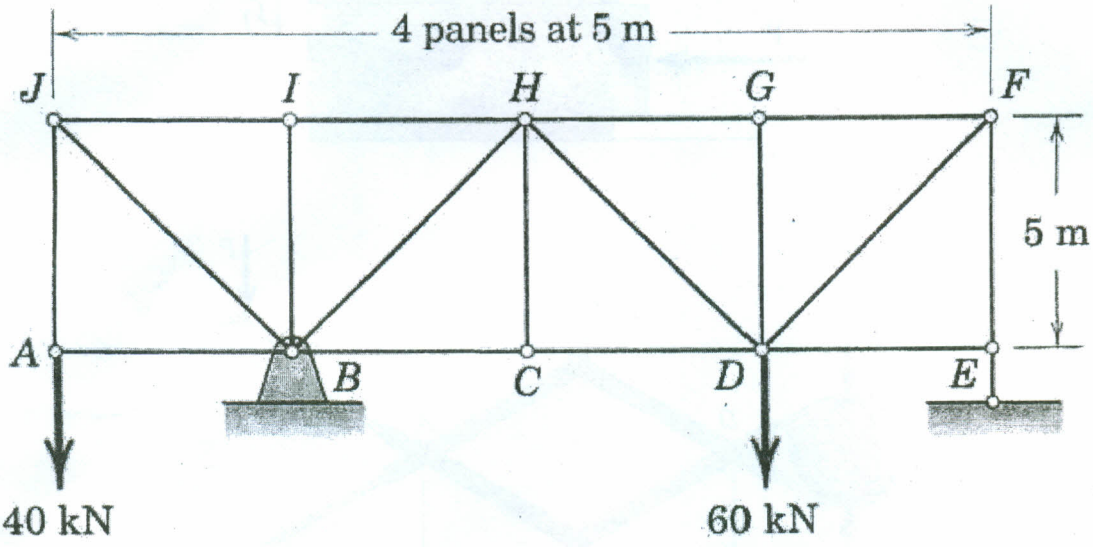
Mansoura University	**7 / 6 / 2014**	**Mechanics**
Faculty of Engineering	**Preparatory– Second Term**	**Time: 2 *hr***
Mathematics and Engineering Physics	**الامتحان 6 أسئلة في صفحتين**	**أ.م.د/ حامد نور**

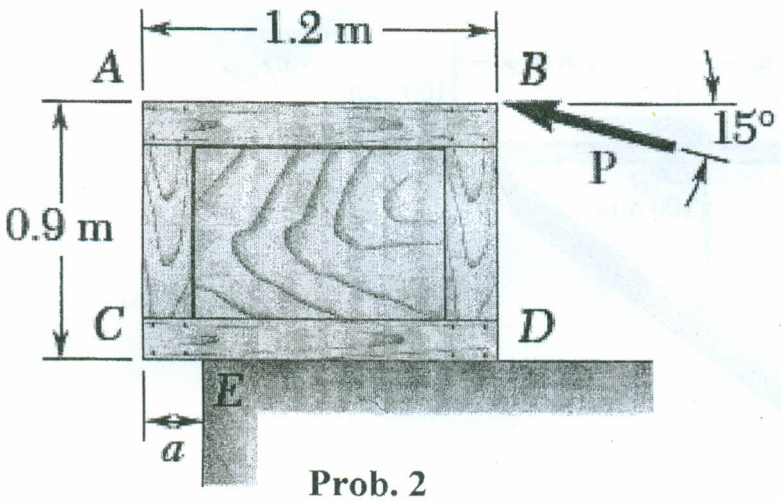
1- (*a*) Determine <u>all</u> zero-force members in the truss shown, and

(*b*) calculate the force in members *IH* and *CD*. **(12 Marks)**

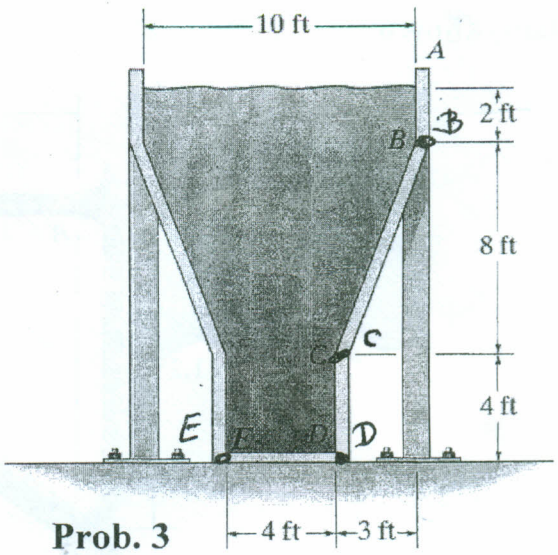


Prob. 1

2- A worker slowly moves a 500-N crate to the left along a loading dock by applying the force P. Knowing that the crate starts to tip about the edge *E* when *a* = 0.2 m, determine: (*a*) the corresponding magnitude *P* of the force. (*b*) the coefficient of friction between the crate and the loading dock. **(12 Marks)**



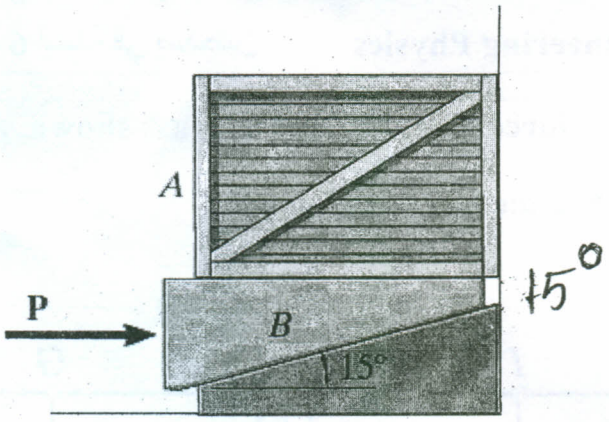
Prob. 2



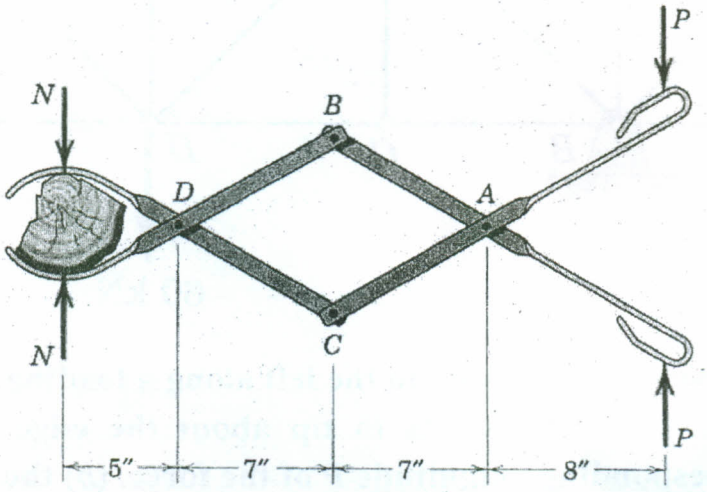
Prob. 3

3- The storage tank contains oil having a specific weight of γ_O = 60 lb/ft^3 . If the tank is 5 ft wide, calculate: (*a*) the force acting on the inclined side *BC*, and specify its location. (*b*) the force acting on the bottom *ED* of the tank. **(12 Marks)**

4- Determine The smallest horizontal force P required to lift the 2 KN crate. The coefficient of static friction at all contacting surfaces is $\mu_s = 0.4$. **(12 Marks)**

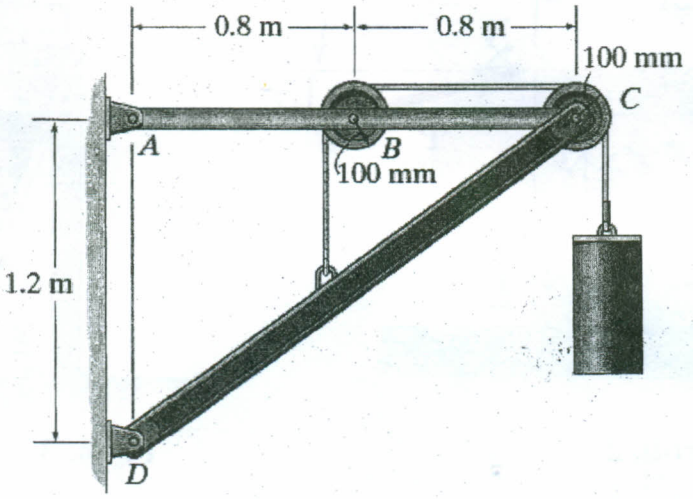


Prob. 4



Prob. 5

5- If P= 10 Ib, determine the force N exerted on the log by each jaw of the fireplace tongs shown. **(11 Marks)**



Prob. 6

6- The frame is used to support the 1 KN cylinder. Determine the force of the pin at C on: (a) member CD and (b) on member ABC. **مع أطيب التمنيات بالسعادة (11 Marks).**