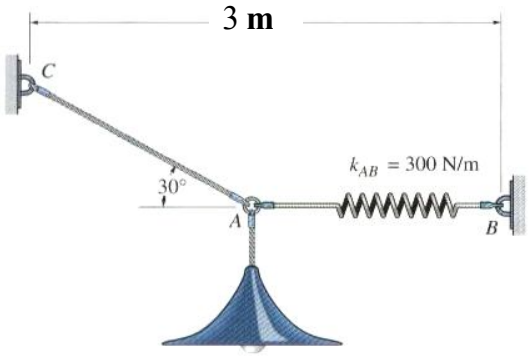
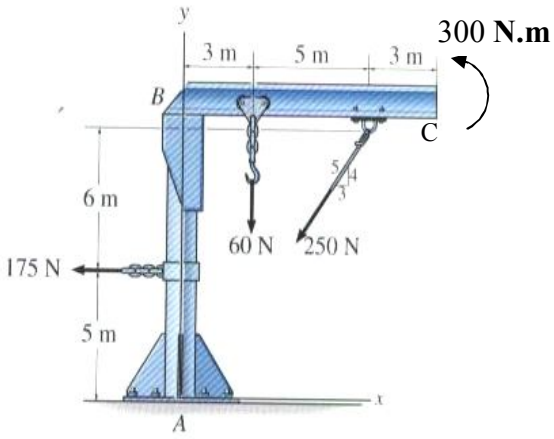
Alexandria Higher Institute of Engineering & Technology (AIET)		
General		Preparatory Year
ME001	Mechanics I	Final, Jan.,31,2010
Examiners:	Prof. Dr. Abd Elfatah Rezk and Dr. Rola Afify	Time: 3 hour

Answer the following questions:

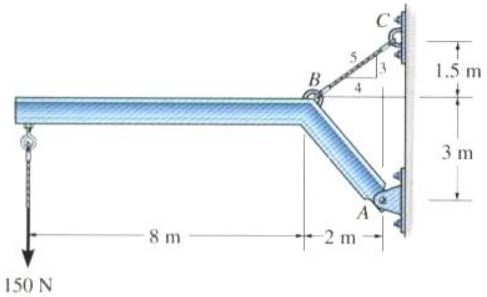
1- Determine the required length of the cord AC so that the 6-kg lamp is suspended in the position shown. The undeformed length of the spring AB is l_o = 0.6 m, and the spring has a stiffness of k_{AB} = 300 N/m.



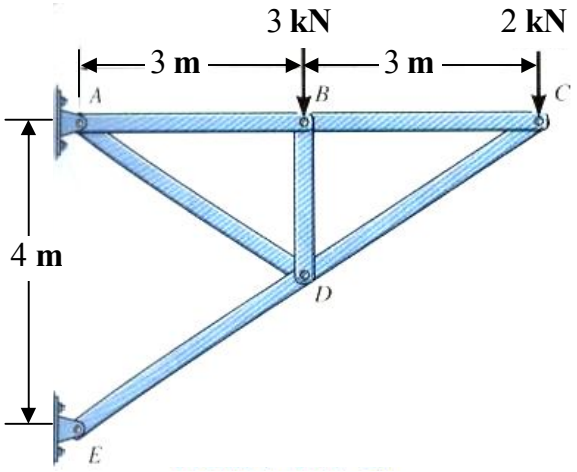


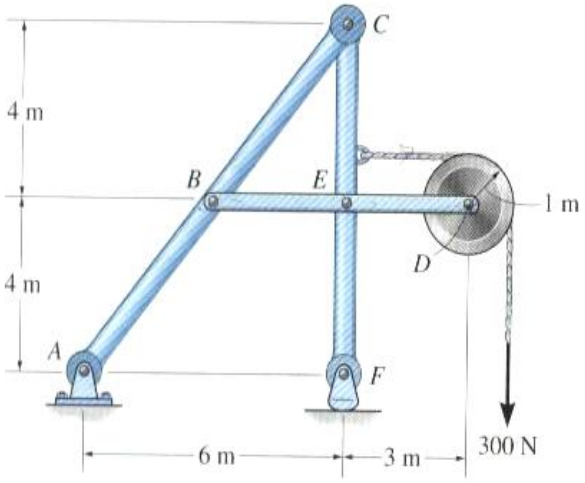
2- The jib crane is subjected to three coplanar forces and a moment. Replace this loading by an equivalent resultant force and specify where the resultant's line of action intersects the boom BC measured from B.

3- A force of 150 N acts on the end of the beam. Determine the magnitude and direction of the reaction at the pin A and the tension in the cable BC.



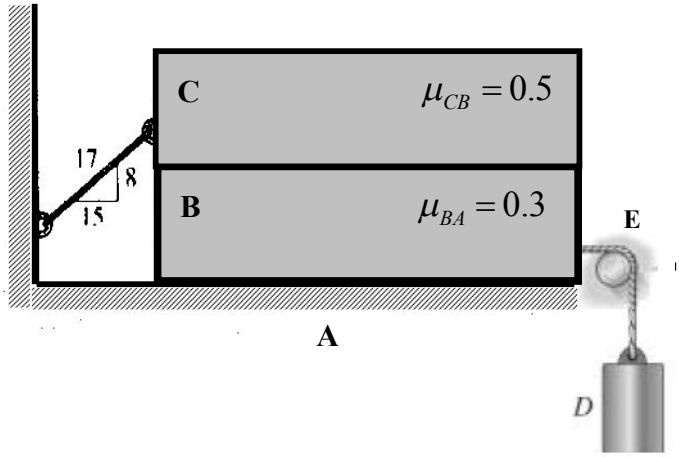
4- Determine the force in each member of the truss and state if the members are in tension or in compression.





5- Determine the horizontal and vertical components of force at pins A, B, C, D and E.

6- The two blocks has weight of W_B = 20 N and W_C = 60 N. If the coefficient of friction is as shown, determine the minimum weight of the block D needed to move the block A. The coefficient of static friction between the peg and the cable is $\mu_E = 0.25$.



 Good Luck