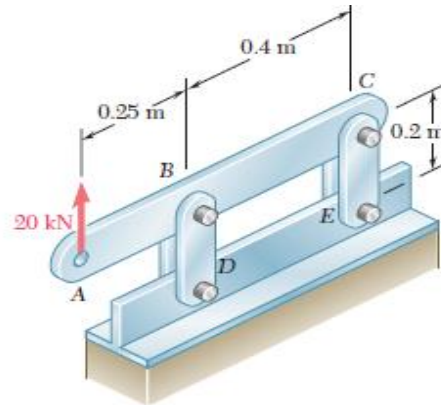


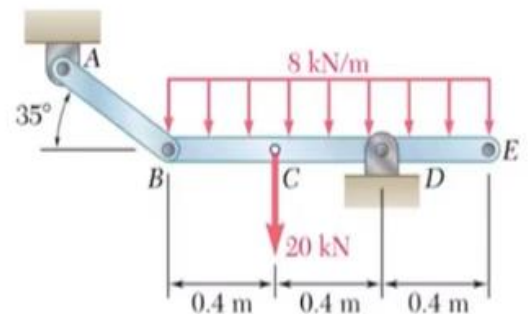
AE 205- Strength of Materials- I

Problem Hour

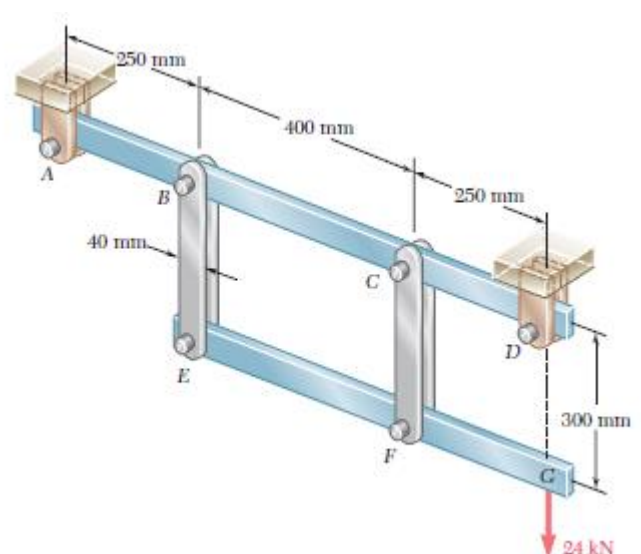
Q1) Each of the four vertical links has an 8x36-mm uniform rectangular cross section and each of the four pins has a 16-mm diameter. Determine the maximum value of the average normal stress in the links connecting (a) points B and D, (b) points C and E.



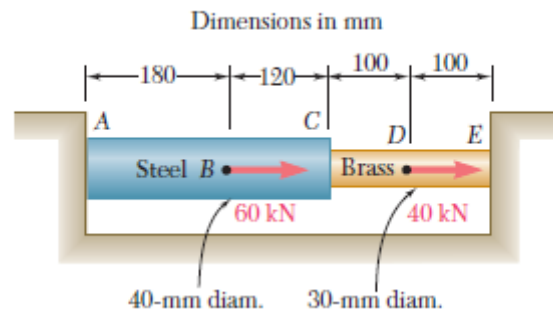
2) Link AB is to be made of a steel for which the ultimate normal stress is 450 MPa. Determine the cross-sectional area of AB for which the factor of safety will be 3.50. Assume that the link will be adequately reinforced around the pins at A and B.



Q3) Each of the four vertical links connecting the two rigid horizontal members is made of aluminum ($E=70$ GPa) and has a uniform rectangular cross section of 10x40 mm. For the loading shown, determine the deflection of (a) point E, (b) point F, (c) point G.



Q4) Two cylindrical rods, one of steel and the other of brass, are joined at C and restrained by rigid supports at A and E. For the loading shown and knowing that $E_s=200$ GPa and $E_b=105$ GPa, determine (a) the reactions at A and E, (b) the deflection of point C.



Q5) At room temperature (20°C) a 0.5 mm gap exist between the ends of the rod shown. At a later time when the temperature has reached 140°C , determine (a) the normal stress in the aluminum rod, (b) the change in the length of the aluminum rod.

