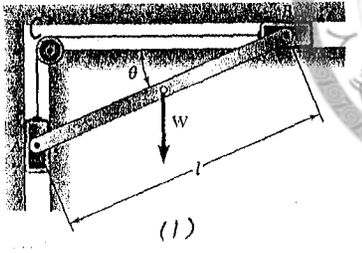
1、A slender rod AB,of weight **W**, is attached to blocks A and B,which move freely in the guides shown as the figure.The blocks are connected by an elastic cord which passes over a small pulley at C. (a) Express **the tension (T)** in the cord in terms of W and Θ. (b) Determine the value of Θ for which the tension in the cord is equal to 3W. (20%)

2、Two 10-lb blocks A and B are connected by a slender rod of negligible weight. The coefficient of static friction is μ=0.30 between all surfaces of contact, and the rod forms an angle Θ=30° with the vertical . (a) Show the system is in equilibrium when P=0. (b) Determine the value of P for which equilibrium is maintained. (20%)

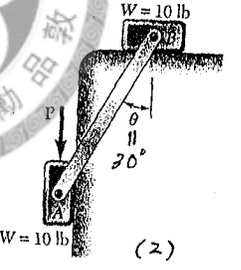
3、A simple beam AB with an overhang BC supports a concentrated load P at the end of the overhang. Assuming EI=constant, determine (a) the angle of rotation at A, (b) the vertical deflection at C. (20%)

4、A steel beam ABC is simply supported at A and B and has an overhang BC of length L=150 mm.The beam supports a uniform load of intensity q=3.5 kn/m over its entire length of 450 mm. The cross section of the beam is rectangular with width b and height 2b.The allowable bending stress in the steel is 60 MPA. Disregarding the weight of the beam, calculate the required width b(mm) of the restangular cross section. (20%)

5、A beam is loaded shown as the figure. Draw the shear and bending-moment diagrams of the beam. (20%)



(1)



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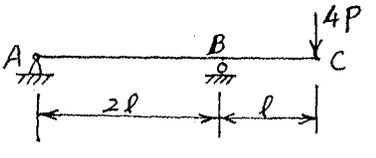

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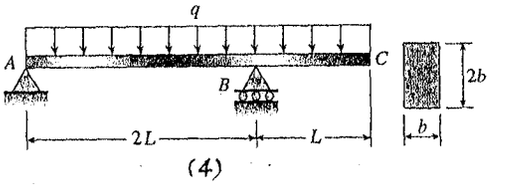
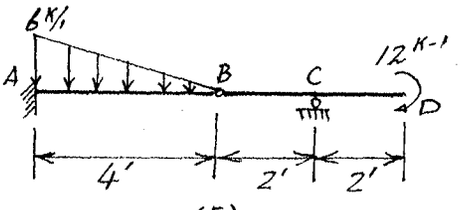


(4)



(5)