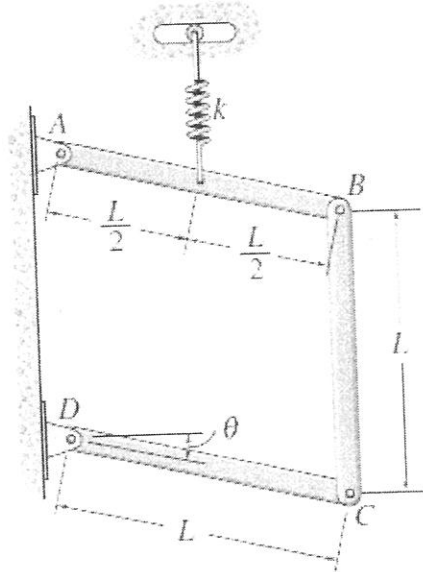


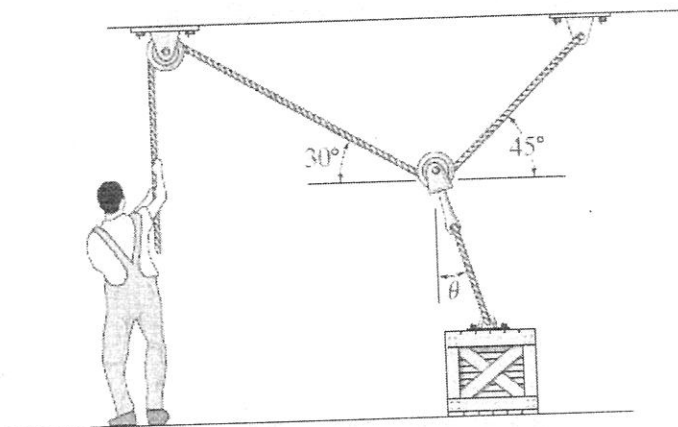
# 1012 機械系博士班資格考試題目

考試科目	方式	
Applied Mechanics (Statics and Dynamics)	Closed Book, Calculator is permitted.	Part I

1. If each of the three uniform links of the mechanism has a length  $L$  and weight  $W$ , determine the angle  $\theta$  for equilibrium. The spring, which always remains vertical, is unstretched when  $\theta = 0$ . (25 %)



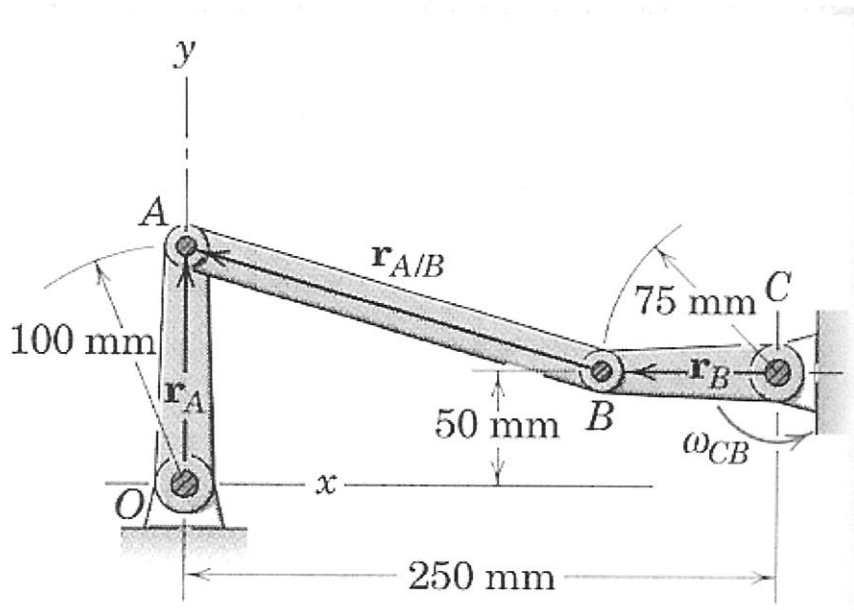
2. Determine the smallest force the man must exert on the rope in order to move the 80-kg crate. Also, what is the angle  $\theta$  at this moment? The coefficient of static friction between the crate and the floor is  $\mu_s = 0.3$ . (25 %)



## 1012 機械系博士班資格考試題目

考試科目	方式	
Applied Mechanics(Statics and Dynamics)	Closed Book, Calculator is permitted.	Part II

1. Crank CB oscillates about C through a limited arc, causing crank OA to oscillate about O. When the linkage passes the position shown with CB horizontal and OA vertical, the angular velocity of CB is 2 rad/s counterclockwise. For this instant, determine the angular velocities and angular accelerations of links AB and OA. (30%)



2. The pendulum has a mass of 7.5 kg with center of mass at G and has a radius of gyration about the pivot O of 295 mm. If the pendulum is released from rest at  $\theta = 0$ , determine the total force supported by the bearing at the instant when  $\theta = 60^\circ$ . Friction in the bearing is negligible. (20%)

