國立臺北科技大學九十七學年度碩士班招生考試

系所組別：1511 自動化科技研究所甲組

第二節　工程力學（選考）試題

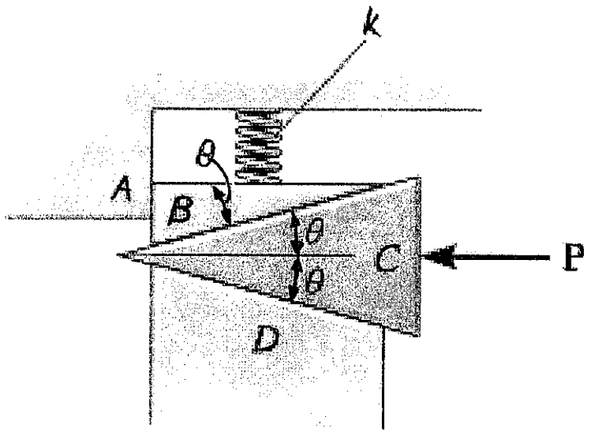
填 准 考 證 號 碼

注意事項：

1. 本試題共 4 題，配分共 100 分。
2. 請標明大題、子題編號作答，不必抄題。
3. 全部答案均須在答案卷之答案欄內作答，否則不予計分。

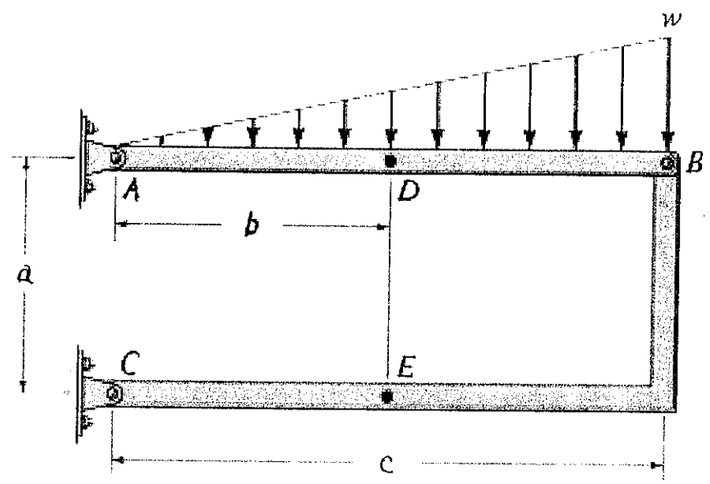
1. The coefficient of static friction between the wedges *B* and *C* is μ_{s1} and between the surfaces of contact *B* and *A* and *C* and *D*, μ_{s2}. Determine the smallest allowable compression length of the spring δ without causing wedge *C* to move to the left. Neglect the weight of the wedges. (25%)

Given: $\mu_{s1} = 0.6$, $\theta = 15$ **deg**, $\mu_{s2} = 0.4$, **k= 500 N/m**, **P** := 50**N**

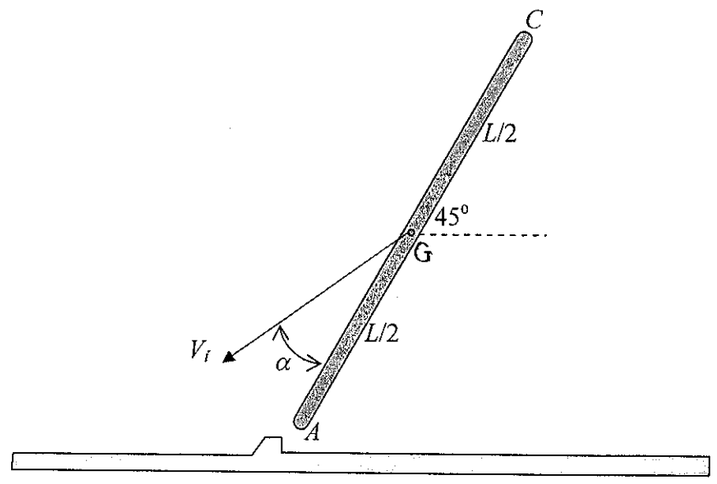


2. Determine the normal force, shear force, and moment at a section passing through point *D* of the two-member frame. Assuming that there is no torque occurring at the hinge A. (25%)

Given: *w*= unit weight (N/m); a, b and c = the various frame lengths (m)



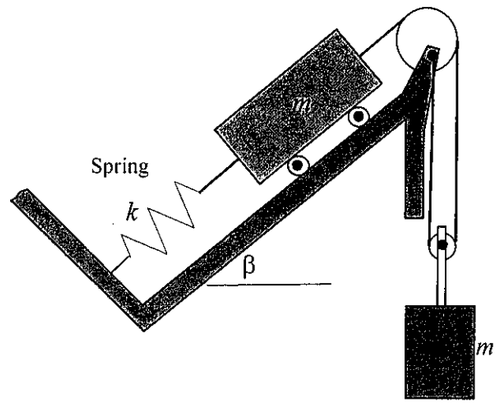
3. The uniform slender bar of mass *m* and length *L* has no angular velocity as the end A strikes the ground against the stop with no rebound. If $\alpha = 30^{\circ}$, what is the minimum magnitude of the initial velocity V_i for which the bar will rotate about A to the vertical position? (25%)



注意：背面尚有試題

At3-1

4. Derive the natural frequency of the system shown in the figure. The mass and friction of the pulleys are negligible. (25%)



At3-2