

國立臺北科技大學九十五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

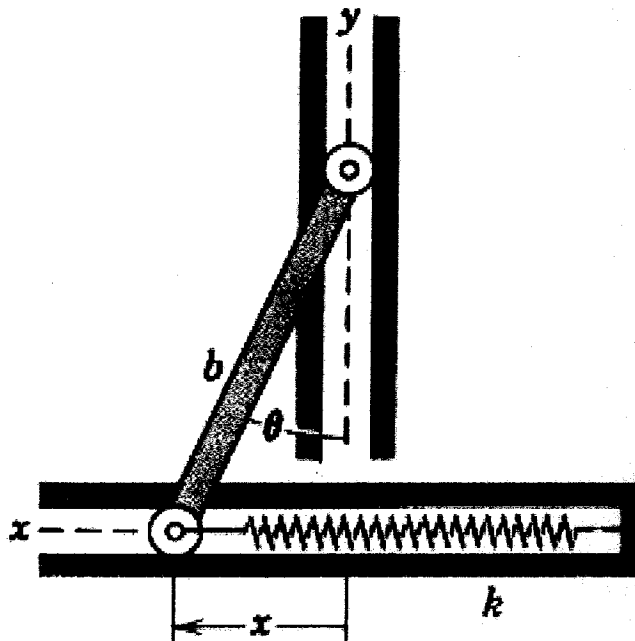
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第一頁 共二頁

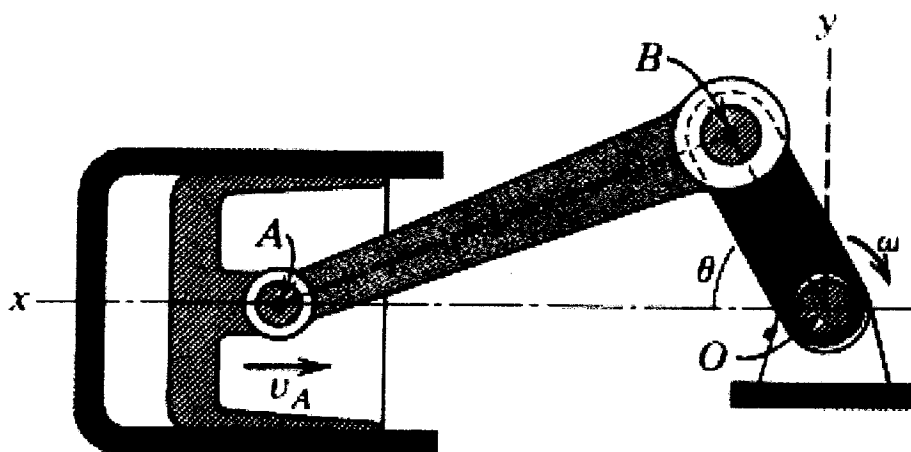
注意事項：

1. 本試題共 5 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。

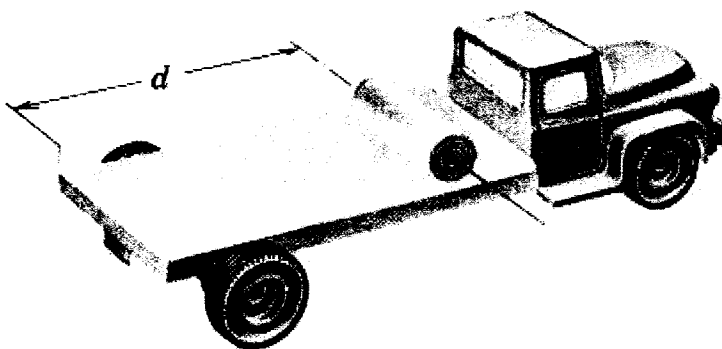
1. The ends of the uniform bar of mass m slide freely in the horizontal and vertical guides. Please find the minimum value of the stiffness k of the spring when the system can be kept stable. (20%)



2. For the slide-crank configuration shown below, derive the expression for the velocity v_A of the piston (taken positive to the right) as a function of θ . (20%)

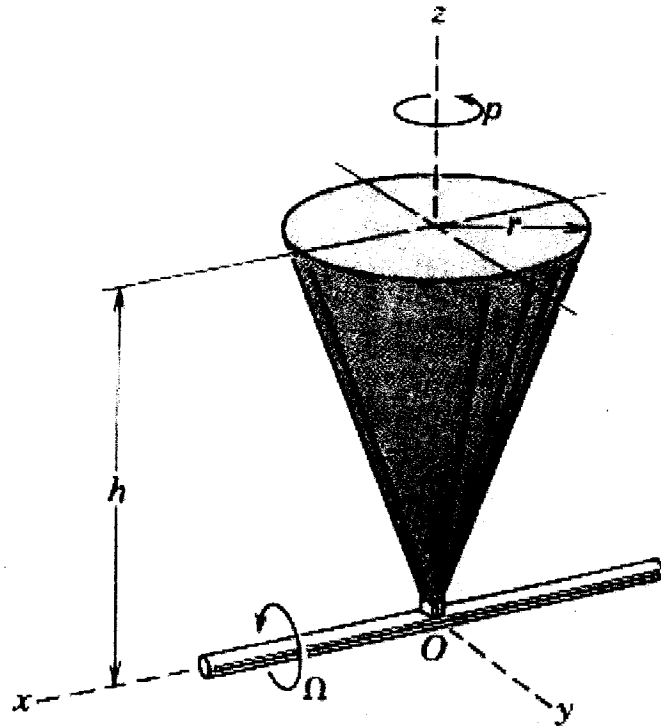


3. The truck, initially at rest with a solid cylindrical roll of paper in the position shown, moves forward with a constant acceleration α . Determine the distance S that the truck goes before the paper rolls off the edge of its horizontal bed. Friction is sufficient to prevent slipping. (20%)



注意：背面尚有試題

4. The right-circular cone of height h and base radius r spins about its axis of symmetry with an angular rate p . Simultaneously, the entire cone revolves about the x -axis with angular rate Ω . Determine the angular momentum H_O of the cone about the origin O of the x - y - z axes and the kinetic energy T for the position shown. The mass of the cone is m . (20%)



5. The beam AB with an attached bracket BCD is supported and loaded as shown in the figure. The flexural rigidity EI is the same for all parts of the structure. Determine the horizontal deflection δ_h and vertical deflection δ_v at point D . (20%)

