1. (25%) Three identical spheres, each of mass m, are supported in the vertical plane on the $30°$ incline. The spheres are welded to two rods of negligible mass. The massless rod AC is pivoted freely to the upper sphere and to A. If the stop B is suddenly removed, determine the velocity ω of the three-ball link before the upper sphere hits the incline.

2. (25%) The crank OA revolves clockwise with a constant angular velocity of 10rad/s within a limited arc of its motion. For the position $\theta = 30°$ determine the acceleration of A as measured relative to the slot in CB.

注意：背面有試題

參考用

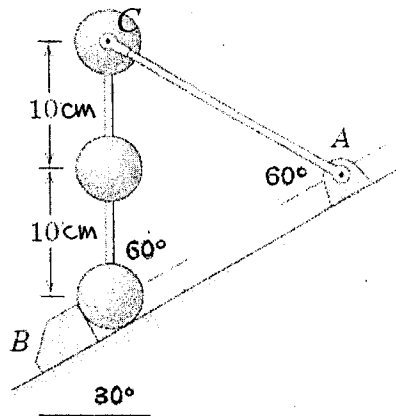國立中央大學100學年度碩士班考試入學試題卷

所別：機械工程學系碩士班 甲組(固力與設計)(一般生)　科目：動力學　共 2 頁 第 2 頁
　　　機械工程學系碩士班 丁組(系統)(一般生)
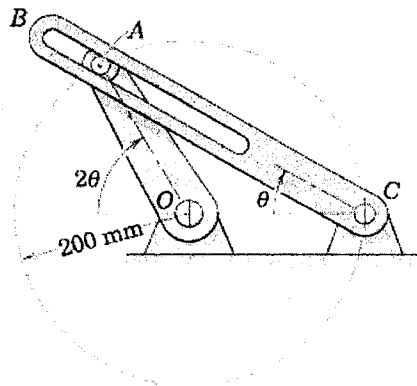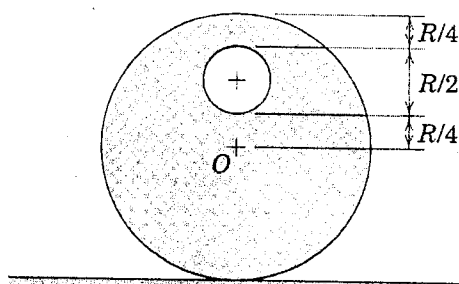　　　機械工程學系光機電工程碩士班 甲組(機電系統控制)(一般生)
　　　機械工程學系光機電工程碩士班 乙組(光機)(一般生)
本科考試可使用計算器，廠牌、功能不拘　　　　　　　　　＊請在試卷答案卷（卡）內作答

3. (25%) A truck carries a 1500mm diameter spool of rope with a total mass of m_s kg. The spool has a mass moment of inertial I_s kg mm^2. The truck alone has a mass of m_t kg with center at G. If the truck starts from rest with an initial acceleration of g and the friction coefficient between the wheels and road is 0.5, determine (a) the tension T in the cable where it attaches to the wall and (b) normal reaction under each pair of wheels. (c) the angular acceleration of the spool. Please neglect the rotational inertia of the truck wheels. (Points will be given only if free body diagram is used to analyze the problem)
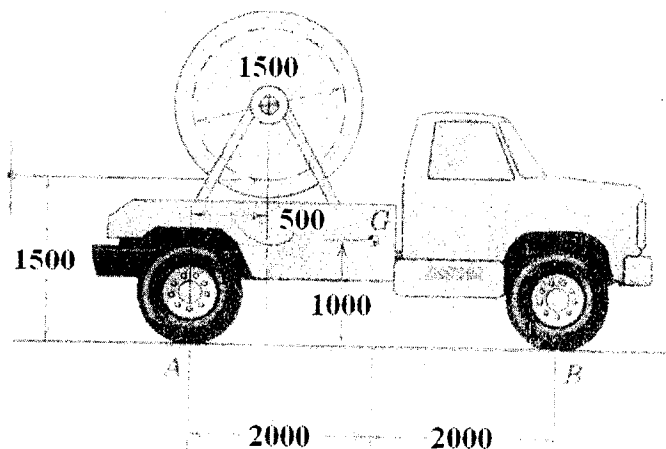
4. (25%) A hole of radius $R/4$ is drilled through a cylinder of radius R to form a body of mass m as shown. If the body rolls on the horizontal surface without slipping, determine the period τ for small oscillations.

注意：背面有試題