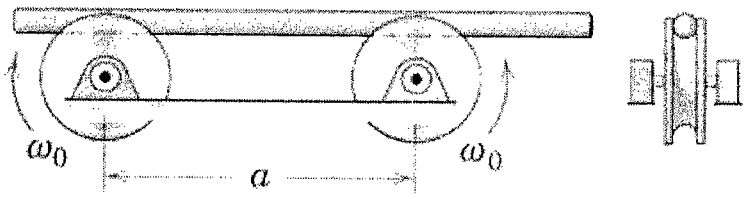
所別：機械工程學系碩士班 甲組(固力與設計)(一般生)　科目：動力學　共 2 頁 第 1 頁
機械工程學系碩士班 丁組(系統)(一般生)
機械工程學系光機電工程碩士班 甲組(機電系統控制)(一般生)
本科考試可使用計算器，廠牌、功能不拘

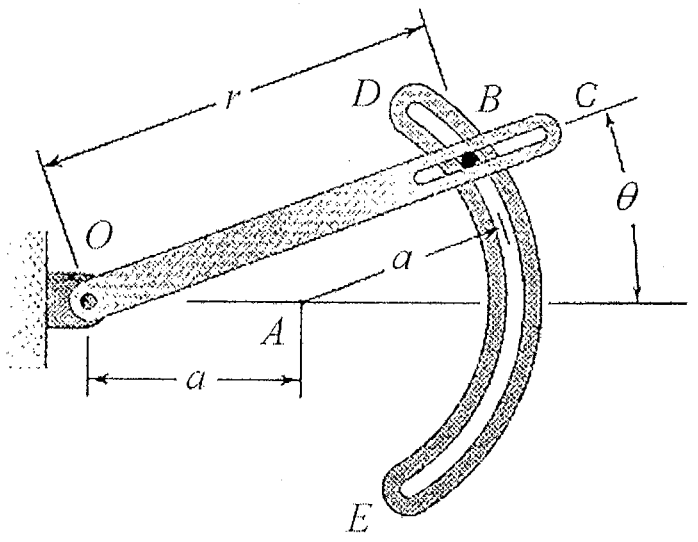
＊請在試卷答案卷（卡）內作答

參考用

1. (25%) The two fixed counterrotating pulleys are driven at the same angular speed ω_0. A round bar is placed off center on the pulleys as shown. Determine the natural frequency of the resulting bar motion. The coefficient of kinetic friction between the bar and pulleys is μ_k.



2. (25%) Pin *B* weights 1 kg and is free to slide in a horizontal plane along the rotating arm OC and the circular slot DE of radius $a = 1$ m. Assume that $\dot{\theta} = 10$ rad/s and $\ddot{\theta} = 20$ rad/s^2. Determine for $\theta = 30°$ (a) the radial and transverse components (R_r and R_θ) of the resultant force exerted on pin *B*, and (b) the force F_1 and F_2 exerted on *B* by rod OC and the wall of Slot DE, respectively.



注意：背面有試題

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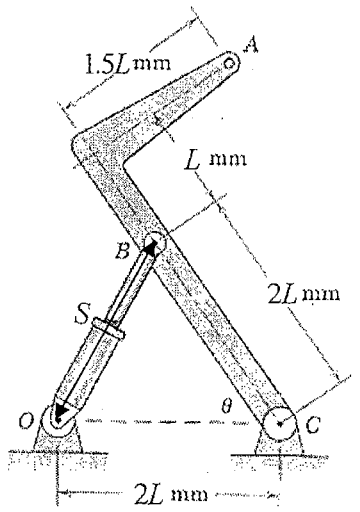
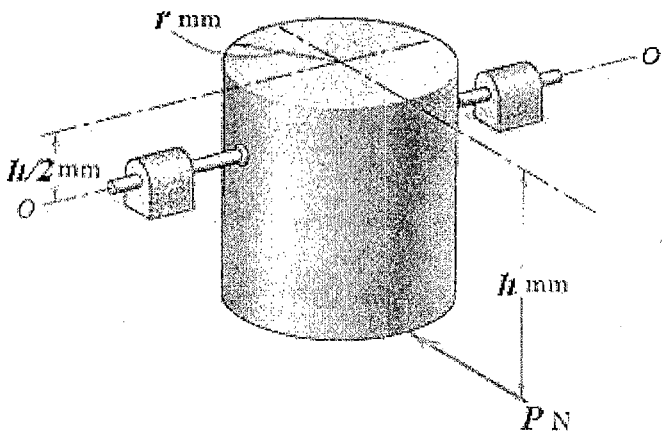
3. (25%) Activation of the hydraulic cylinder causes OB to elongate at the constant rate of $\dot{s}$ m/s. Please calculate the acceleration of point A for the instant when $\theta = 60^\circ$.



4. (25%) The solid homogeneous cylinder has a mass of m kg and is free to rotate about the horizontal axis O-O. If the cylinder, initially at rest, is acted upon by the P N force shown, please calculate the reaction forces supported by each of the two symmetrically placed bearings.



注意:背面有試題