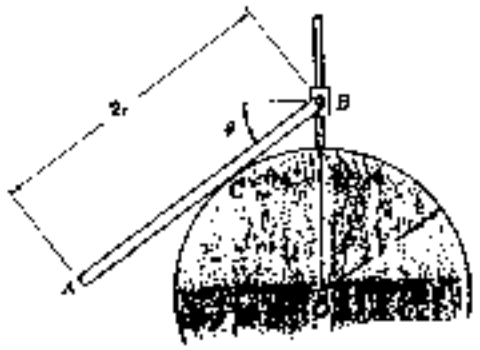
國　立　清　華　大　學　命　題　紙

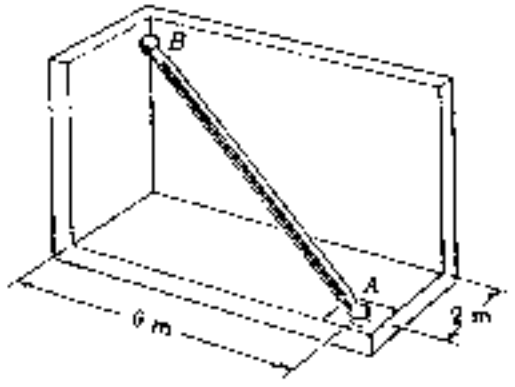
八十六學年度 材料科學工程學 系（所） 甲乙丙 組碩士班研究生入學考試

科目 工程力學(1) 科號 2401 2501 共 2 頁第 1 頁 *請在試卷【答案卷】內作答

1. A slender rod of length $2r$ and weight W is attached to a collar at B and rests on a circular cylinder of radius r. Knowing that the collar may slide freely along a vertical guide and neglecting friction, determine the value of θ corresponding to equilibrium, also calculate the reactions at B and C. (25%)



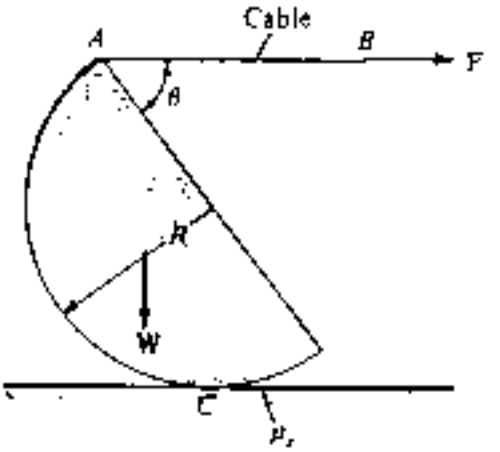
2. The uniform 11-m shaft has a mass of 100-kg and is supported by a ball-and-socket joint at A in the horizontal floor. The ball end B rests against the two smooth vertical walls as shown. Determine the forces exerted by the walls and the floor on the ends of the shaft. (25%)



八十六學年度 材料科學工程學 系（所） 乙 組碩士班研究生入學考試

科目 工程力學(I) 科號 2401 共 2 頁第 2 頁 *請在試卷【答案卷】內作答

3. The solid half-cylinder shown has a weight of W. It is being pulled by a cord AB. For impending slippage at C, determine (a) the angle θ, (b) the corresponding cable force F. Denoted μ_s the coefficient of friction between the half-cylinder and the floor. (25%)



4. Determine the magnitude of the force P required to maintain the equilibrium of the linkage. (25%)