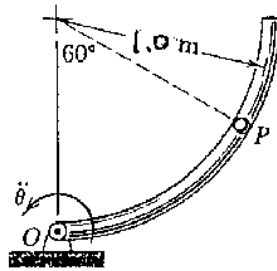


國立中央大學八十七學年度碩士班研究生入學試題卷

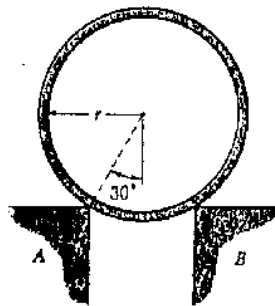
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- (1). A standard gear with 24 teeth is in mesh with another standard gear with 60 teeth. The pressure angle (ϕ) and the module (m) of these two gears are 20° and 4 mm respectively. The addendum of the standard gear is $1.0m$. If the center distance is increased by 1mm during operation. 25%
- Calculate the operating pressure angle.
 - Calculate the operating contact ratio.
 - What is the minimum acceptable value of contact ratio? Why?

- (2). The tube of circular cross section starts from rest at $t = 0$ and rotates about O in a horizontal plane with constant angular acceleration 2 rad/s^2 . At $t = 0$, the 0.5 kg particle P is at the position shown in the figure. At what time will P slip relative to the tube? The coefficients of static and kinetic friction between the particle and the tube are 0.8 and 0.5. (25%)



- (3). A section of pipe, of mass 50kg and radius 250mm, rests on two corners as shown. Assuming that μ between the corners and the pipe is sufficient to prevent sliding, determine (a) the angular acceleration of the pipe just after corner B is removed, (b) the corresponding magnitude of the reaction at A . (25%)



參考用

注意：背面有試題

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- (4): The uniform semicylindrical shell of mass m and radius r is released from rest in the position shown with its lower edge resting on the horizontal surface. Determine the minimum coefficient of static friction μ_s which is necessary to prevent any initial slipping of the shell. (25%)

