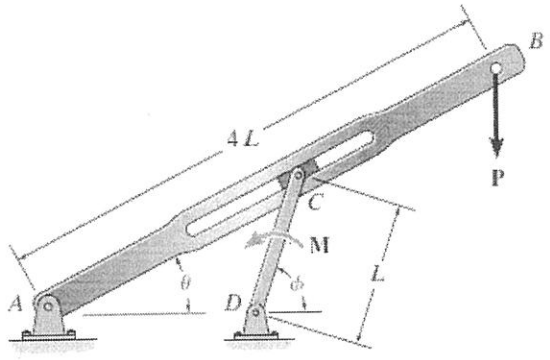
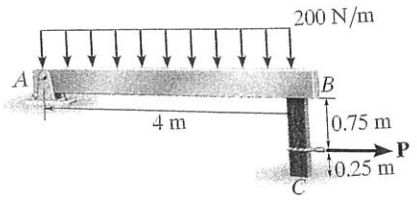
1011 機械系博士班資格考試題目

考試科目	方式	
Applied Mechanics(Statics and Dynamics	**Closed Book, Calculator is permitted.**	**Part I**

1. Determine the couple moment M that must be applied to member DC for equilibrium of the quick-return mechanism. Express the result in terms of the angles $\emptyset$ and θ, dimension L, and the applied vertical force P. The block at C is confined to slide within the slot of member AB. (25 %)



2. Beam AB is subjected to a uniform load of 200 N/m and is supported at B by post BC as shown in the figure. If the coefficients of static friction at B and C are $\mu_B = 0.2$ and $\mu_C = 0.5$, respectively, determine the force P needed to pull the post out from the under beam. Neglect the weight of the members and the thickness of the beam. (25 %)



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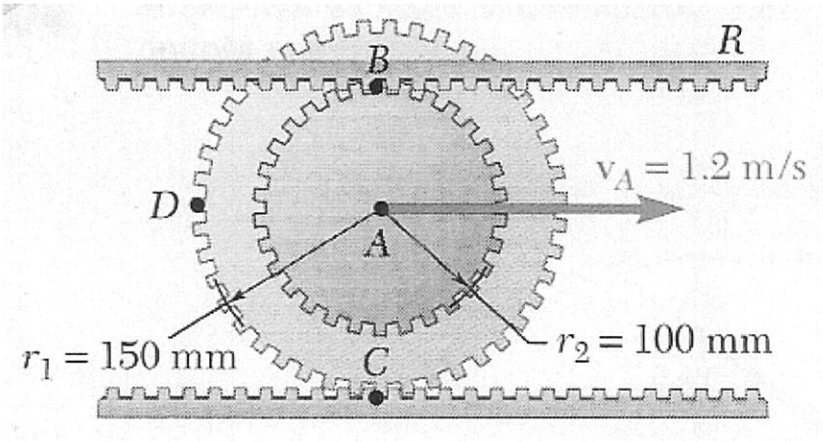
考試科目	方式	
Applied Mechanics(Statics and Dynamics	Closed Book, Calculator is permitted.	Part II

1. The double gear shown rolls on the stationary lower rack; the velocity of its center *A* is 1.2 m/s directed to the right. Determine
   (a) the angular velocity of the gear, (10%)
   (b) the velocity of the upper rack R and of point D of the gear. (10%)



2. A cord is wrapped around a homogeneous disk of radius r = 0.5 m and mass m = 15 kg. If the cord is pulled upward with a force T of magnitude 180 N, determine
   (a) the acceleration components of the center of thee disk, (10%)
   (b) the angular acceleration of the disk, (10%)
   (c) the acceleration of the cord. (10%)