

※ 考生請注意：本試題 可 不可 使用計算機

1. A solid, continuous round bar shown in Figure 1 can be viewed as comprised of a straight segment and a curved segment. (15%)
 - (a) Draw free-body diagrams for the segments 1 and 2. (5%)
 - (b) Determine the forces and moments acting on both segments by neglecting the weight of the member. (10%)

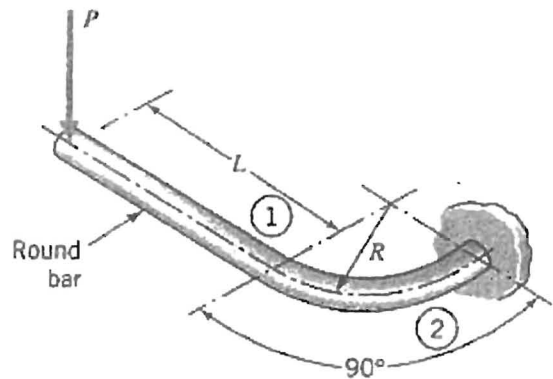


Figure 1

2. Three cables are attached to a bracket as shown. Replace the forces exerted by the cables with an equivalent force-couple system at A. (23%)

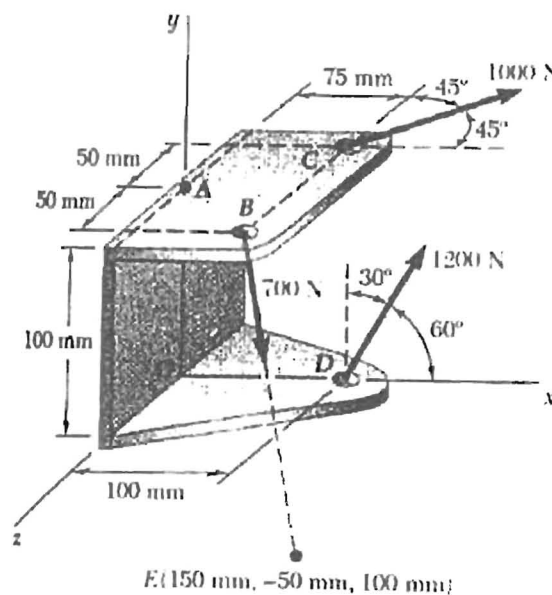


Figure 2

(背面仍有題目,請繼續作答)

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3, A uniform block of mass m is at rest on an incline θ . The coefficient of static friction between the block and the incline is μ_s . Please determine (20%)

- (a) the maximum force P which can be applied to the block in the direction shown before slipping begins. (10%)
- (b) the angle β between the horizontal direction of P and the direction of initial movement of the block. (10%)

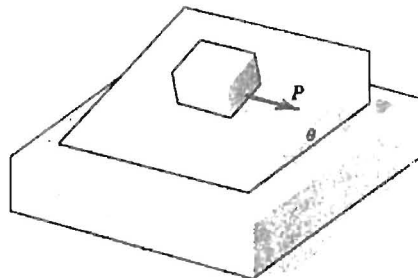


Figure 3

4, A two-level bike parking system is as shown. Please express the compression C in the hydraulic cylinder of the system in terms of the angle θ . The mass of the structure is negligible compared with the mass m of the bicycle. Assuming the length of the hydraulic cylinder is l , the mass center of the bicycle to the ground is h and to the 2nd-level floor is h_0 . (17%)

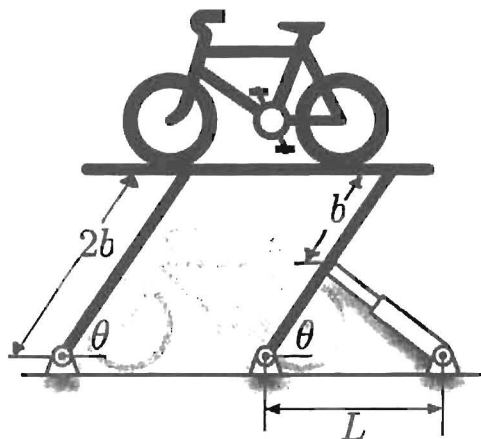


Figure 4

系所組別： 機械工程學系丙組

考試科目： 靜力學及專業英文

考試日期：0219 · 節次：1

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5. 專業英文：翻譯下列英文為中文、中文為英文 (25%)

- (a) 一般量測系統分為接觸式及非接觸式兩大類，非接觸式量測系統又分為光學式及非光學式兩種。(12%)
- (b) Engineers are not educated to study humans, except in some specific circumstances, like human factors or bioengineering. Humans are messy and unpredictable. On the other hand, nature must have appeared just so to early humans. Engineers have used the physical sciences to their advantage to build technologies that do serve humankind. (13%)