

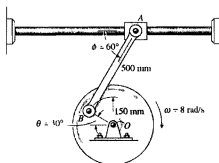
系所組別 系統及船舶機電工程學系乙組

考試科目 動力學

考試日期 0307 節次 2

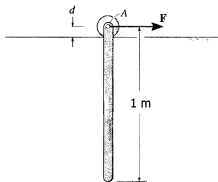
※ 考生請注意：本試題 可 不可 使用計算機

1. 參考圖一，使用瞬間零速度中心的方法，計算 A 點速度與 AB 桿件之旋轉角速度。(15%)



圖一

2. 如圖二，一個均勻質量的桿重 30kg 自 A 點與一滑輪鉸接在一起，並可以沿水平面自由滑動。原先為停止狀態時，在 A 點施加  $F=40\text{N}$  之力時，求 桿件之角加速度與 A 點之加速度？滑輪質量與大小可忽略不計。25%



圖二

(背面仍有題目,請繼續作答)

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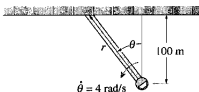
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Fig. 3

4: As shown in Fig 4, the base point A represents the origin of the  $x$ , and  $y$  coordinate system, which is assumed to be both translating and rotating with respect to the  $X$  and  $Y$  system. **Derive** the formulas representing the **absolute velocity and acceleration of B** in terms of the absolute velocity  $V_A$  and the acceleration  $a_A$  of A, relative position vector, relative velocity and relative acceleration of B to A,  $r_{B/A}$ ,  $V_{B/A}$  and  $a_{B/A}$ , respectively. 15%

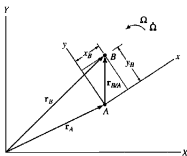


Fig 4

5. A uniform rod AB, of weight 30kg and length 1 meter, is attached to the 40kg cart C. Knowing that the system is released from rest in the position shown and neglecting friction, determine (a) the velocity of the mass center of rod AB passes through a vertical position; (b) the corresponding velocity of cart C; (c) the angular acceleration of the rod. ( Fig 5, 30% )

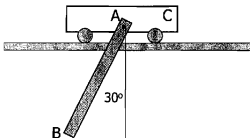


Fig. 5