

國立虎尾科技大學 106 學年度第一學期博士班資格考試題

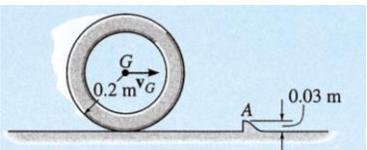
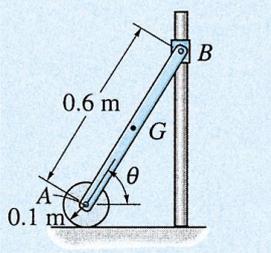
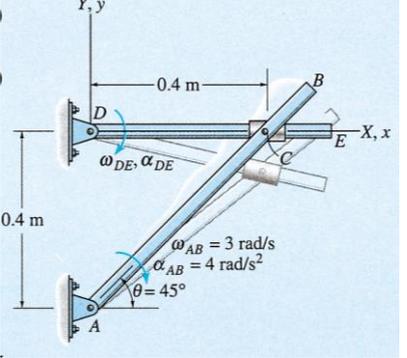
系別：動力機械工程系機械與機電工程博士班

第 1 頁 共 1 頁

科目：動力學

注意事項：

- (1) 本試題共有 4 題，任選 4 題作答，每題 25 分，合計一百分。
- (2) 請依序作答於答案卷上並註明題號，若未註明選答題號及超過規定題數時，謹採計作答順序較前之題目計分。
- (3) 可使用計算機，close book

1	<p>The 10-Kg wheel shown in Figure has a moment of inertia $I_G=0.156 \text{ Kg.m}^2$. Assuming that the wheel does not slip or rebound, determine the minimum velocity v_G it must have to roll over the obstruction at A.</p>	
2	<p>The 10-Kg homogeneous disk shown in Figure is attached to a uniform 5-Kg rod AB. If the assembly is released from rest when $\theta = 60^\circ$, determine the angular velocity of the rod when $\theta = 0^\circ$. Assume that the disk rolls without slipping. Neglect friction along the guide and the mass of the collar at B.</p>	
3.	<p>The rod AB, shown in Figure, rotates clockwise such that it has an angular velocity $\omega_{AB} = 3 \text{ rad/s}$ and angular acceleration $\alpha_{AB} = 4 \text{ rad/s}^2$ when $\theta = 45^\circ$. Determine the angular motion of rod DE at this instant. The collar at C is pin-connected to AB and slides over rod DE.</p>	
4	<p>The 2=Kg disk shown in Figure rests on a smooth horizontal surface and is attached to an elastic cord that has a stiffness $k_c = 20 \text{ N/m}$ and is initially unstretched. If the disk is given a velocity $(v_D)_1 = 1.5 \text{ m/s}$, perpendicular to the cord, determine the rate at which the cord is being stretched and the speed of the disk at the instant the cord is stretched 0.2 m.</p>	