國立虎尾科技大學105學年度第1學期博士班資格考試題
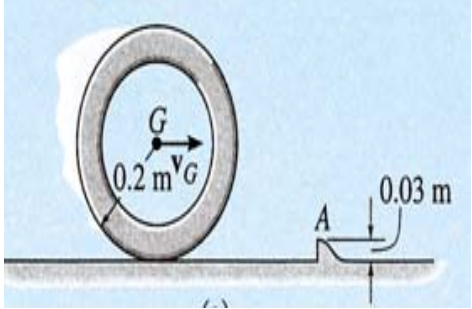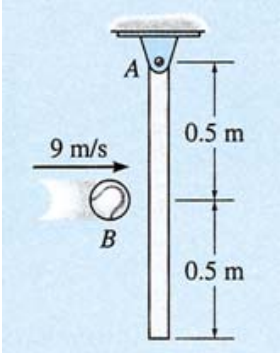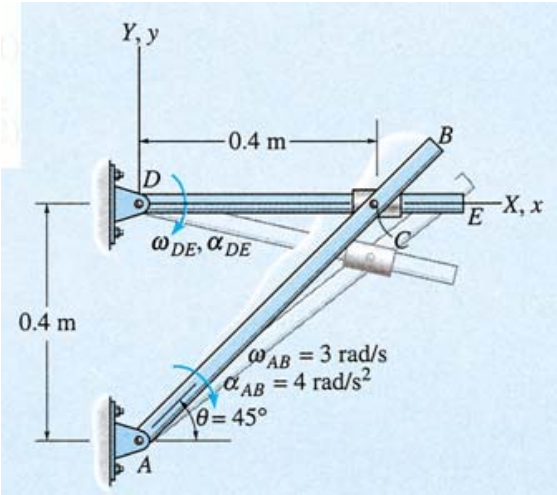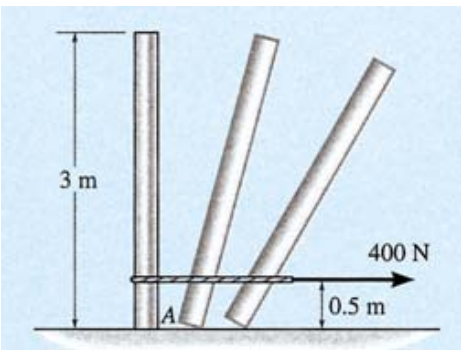
系別:動力機械系機械與機電工程博士班
科目:動力學資格考

注意事項:
(1)本試題共有4題,合計100分。
(2)請依序作答於答案卷上並註明題號。
(3)可使用計算機 close book

1		The 10-Kg wheel shown in Figure has a moment of inertia I_G = 0.156 Kg.m². Assuming that the wheel does not slip or rebound, determine the minimum velocity v_G it must have to just rool over the obstruction at A.
2		The 5-kg slender rod is suspended from the pin at A shown in Figure. If a 1-kg ball B is thrown at the rod and strikes its center with a horizontal velocity of 9 m/s, detremine the angular velocity of the rod just after impact. The coefficient of restitution is e = 0.4.
3		The rod AB, shown in Figure, rotates clockwise such that it has an angular velocity α_{AB} = 4 rad/s² when θ = 45⁰. Determine the angular motion of rod DE at this instant. The collar at C is pin-connected to AB and slides over rod DE.
4		The uniform slender pole shown in Figure has a mass of 100 kg and a moment of inertia I_G = 75 Kg.m². If the coefficients of static and kinetic friction between the end of the pole and the surface are μ_s=0.3 and μ_k=0.25, respectively, determine the pole's angular acceleration at the instant the 400-N horizontal force is applied. The pole is originally at rest.