

國立臺北科技大學 112 學年度碩士班招生考試

系所組別：1301 車輛工程系碩士班

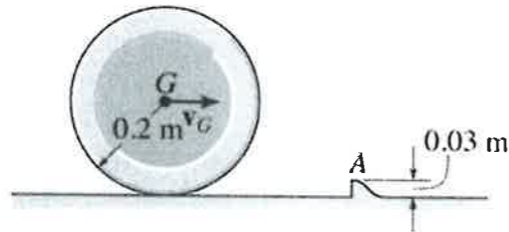
第二節 動力學 試題 (選考)

第 1 頁 共 1 頁

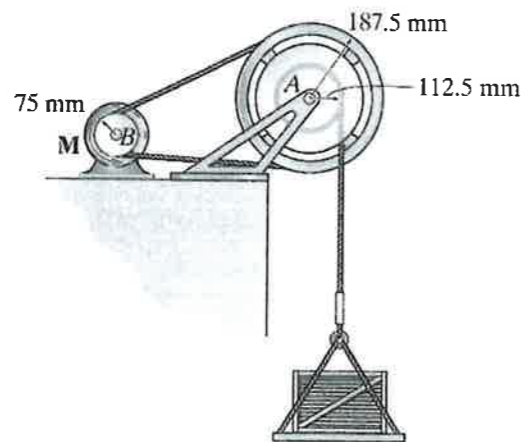
注意事項：

1. 本試題共 5 題，每題 20 分，共 100 分。
2. 不必抄題，作答時請將試題題號及答案依照順序寫在答案卷上。
3. 全部答案均須在答案卷之答案欄內作答，否則不予計分。

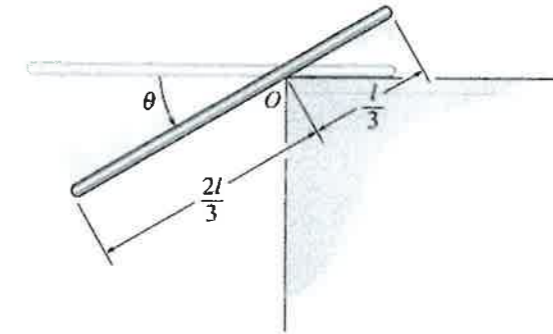
1. The 10-kg wheel, shown in the Figure, has a moment of inertia $I_G = 0.156 \text{ kg}\cdot\text{m}^2$. Assuming the wheel does not slip or rebound, determine the minimum velocity v_G it must have to just roll over the obstruction at A. (20%)



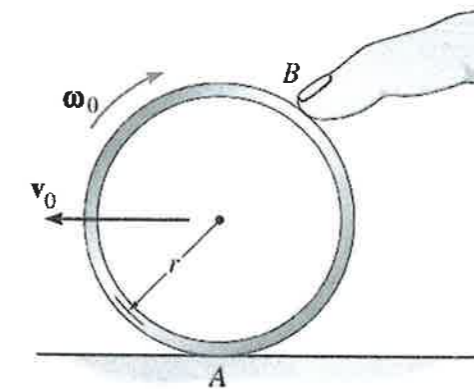
2. The wheel and the attached reel have a combined mass of 25 kg and a radius of gyration about their center of $k_A = 150 \text{ mm}$. If pulley B attached to the motor is subjected to a torque of $M = 75 \text{ N}\cdot\text{m}$, determine the velocity of the 100-kg crate after the pulley has turned 5 revolutions. Neglect the mass of the pulley. (20%)



3. The uniform bar has a mass m and length l . If it is released from rest when $\theta = 0^\circ$, determine the angle θ at which it first begins to slip. The coefficient of static friction at O is $\mu_s = 0.3$. (20%)



4. By pressing down with the finger at B, a thin ring having a mass m is given an initial velocity v_0 and a backspin ω_0 when the finger is released. If the coefficient of kinetic friction between the table and the ring is μ_k , determine the distance the ring travels forward before back-spinning stops. (20%)



5. The 10-kg block A rests on the 50-kg plate B in the position shown. Neglecting the mass of the rope and pulley, and using the coefficients of kinetic friction indicated, determine the time needed for block A to slide 0.5 m on the plate when the system is released from rest. (20%)

