國立虎尾科技大學 107 學年度第一學期博士班資格考試題
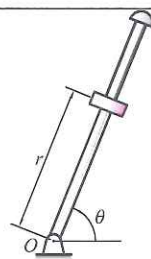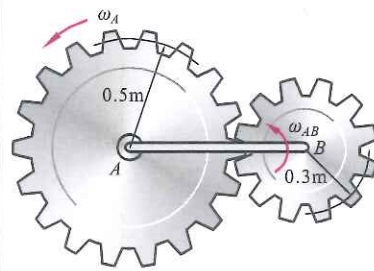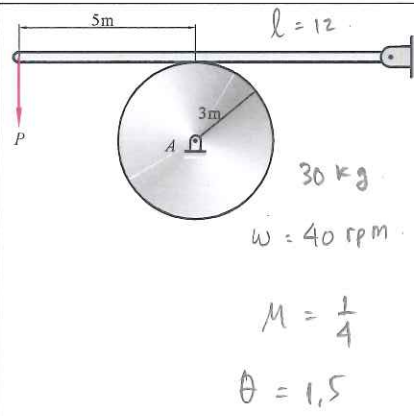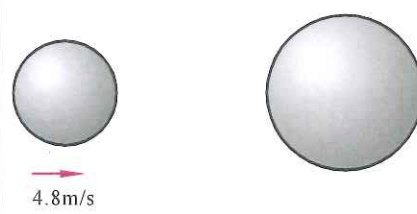
系別：動力機械工程系機械與機電工程博士班　　　　　第 1 頁　共 1 頁
科目：動力學（**Dynamics**）

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）可以使用計算機(Engineering calculator is allowable)，Close book

1	The rod rotates counterclockwise around the O point, and a slider on the rod slides outward at the same time. If $r = t^2 + 6t$, $\theta = t^2$, the unit of r is m, the unit of θ is rad, and the unit of t is sec. Try to find the slider's velocity v and acceleration a at t=4 sec.	
2	There are two gears A and B. If A is fixed, and the B gear is rolled on the A gear. When the gear A rotates at an angular speed of 7 rad/s with r_A=0.5m, the link AB rotates at an angular speed of 5 rad/s. Please determine the angular velocity of the gear B with r_B=0.3m.	
3.	The figure shows a wheel A with a mass of 30 kg and a rotation speed of <u>40 rpm</u>. If the length of a brake lever is 12 m, the mass of a brake lever is ignored, and a pressure of P is applied to the end point to stop the wheel. Assume that the friction coefficient of the contact point between the wheel and the lever is 0.25. The wheel is stopped after the wheel rotates for 1.5 cycles. Determine the force P should be applied?	
4	A steel ball A with a mass of 0.8 kg move forward with a speed of 4.8 m/s to collide with another static steel ball B with a mass of 2.4 kg. If the recovery elastic coefficient $e = 0.8$ between the two steel balls, please determine (a) The speed of A and B balls after the collision? (b) Loss of kinetic energy after collision?	