

國立虎尾科技大學 104 學年度第 2 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

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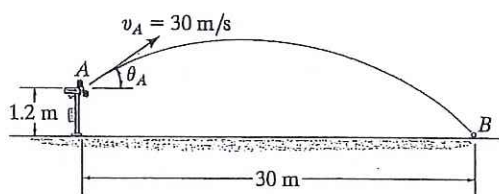
科目：動力學

注意事項：

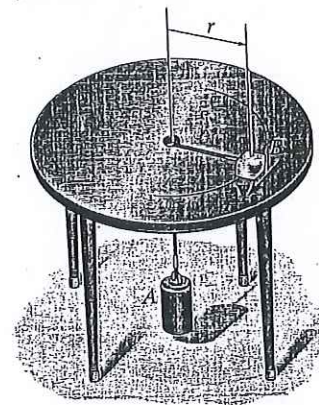
- (1) 本試題共有 4 題，每題 25 分，合計一百分。
- (2) 請依序作答於答案卷上並註明題號，若未註明選答題號及超過規定題數時，謹採計作答順序較前之題目計分。
- (3) 使用計算機，close book。

$$g = 10.0 \text{ m/s}^2$$

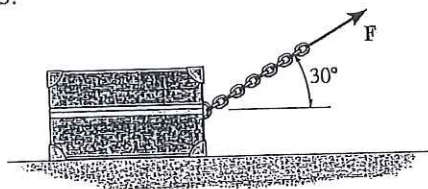
1. The pitching machine is adjusted so that the baseball is launched with a speed of $v_A = 30 \text{ m/s}$. If the ball strikes the ground at B , determine the two possible angles θ_A at which it was launched.



2. The 2-kg block B and 15-kg cylinder A are connected to a light cord that passes through a hole in the center of the smooth table. If the block travels along a circular path of radius $r = 1.5 \text{ m}$, determine the speed of the block.



3. The 20-kg crate is subjected to a force having a constant direction and a magnitude $F = 100 \text{ N}$. When $s = 15 \text{ m}$, the crate is moving to the right with a speed of 8 m/s . Determine its speed when $s = 25 \text{ m}$. The coefficient of kinetic friction between the crate and the ground is $\mu_k = 0.25$.



4. The boy B jumps off the canoe at A with a velocity of 5 m/s relative to the canoe as shown. If he lands in the second canoe C , determine the final speed of both canoes after the motion. Each canoe has a mass of 40 kg . The boy's mass is 30 kg , and the girl D has a mass of 25 kg . Both canoes are originally at rest.

