

114VE02

國立臺北科技大學 114 學年度碩士班招生考試

系所組別：1301 車輛工程系碩士班

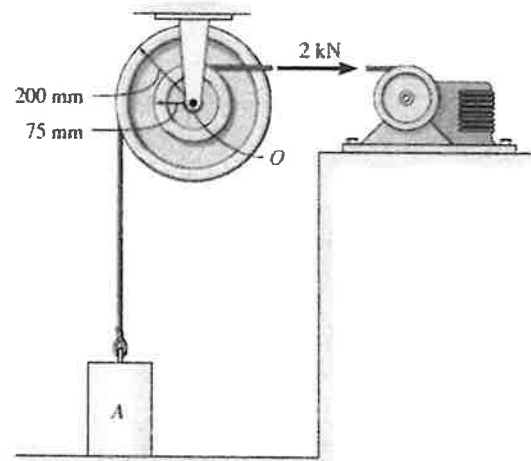
第二節 動力學 試題（選考）

第 1 頁 共 1 頁

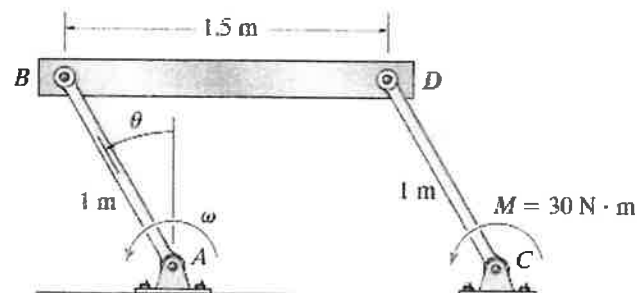
注意事項：

1. 本試題共 4 題，每題 25 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。

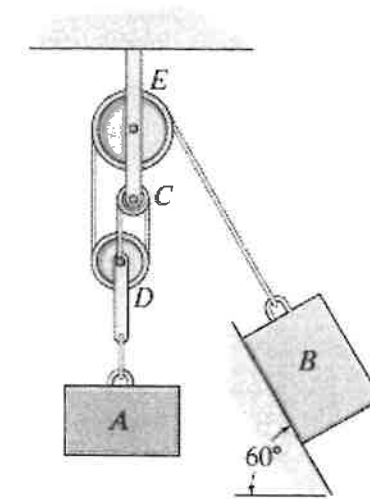
1. The double pulley consists of two wheels which are attached to one another and turn at the same rate. The pulley has a mass of 15 kg and a radius of gyration of $k_o = 110$ mm. If the block at A has a mass of 40 kg, determine the speed of the block in 3 s after a constant force of 2 kN is applied to the rope wrapped around the inner hub of the pulley. The block is originally at rest. (25%)



2. The linkage consists of two 6-kg rods AB and CD and a 20-kg bar BD. When $\theta = 0^\circ$, rod AB is rotating with an angular velocity $\omega = 2$ rad/s. If rod CD is subjected to a couple moment $M = 30$ N·m, determine ω at the instant $\theta = 45^\circ$. (25%)



3. Determine the required mass of block A so that when it is released from rest it moves the 5-kg block B 0.75 m up along the smooth inclined plane in $t = 2$ s. Neglect the mass of the pulleys and cords. (25%)



4. Block A has a mass of 2 kg and slides into an open ended box B with a velocity of 2 m/s. The box B has a mass of 3 kg and rests on top of a plate P that has a mass of 3 kg. The coefficient of kinetic friction between the box and the plate is $\mu_k = 0.2$, and between the plate and the floor $\mu_k = 0.4$. Also, the coefficient of static friction between the plate and the floor is $\mu_s = 0.5$. Determine
 - (a) the distance the plate moves after it stops sliding on the floor (15%)
 - (b) how long is it after impact before all motion ceases? (10%)

