VE02

國立臺北科技大學 108 學年度碩士班招生考試

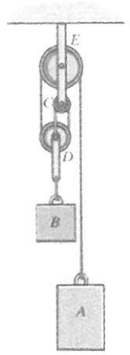
系所組別：1301 車輛工程系碩士班

第二節　動力學　試題（選考）

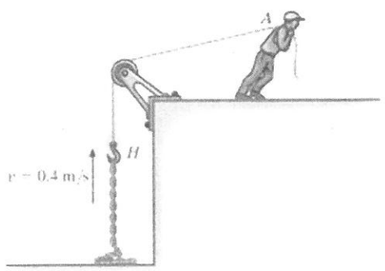
注意事項：

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。

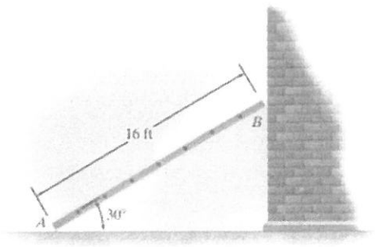
1. The 50-kg block A is released from rest. Determine the velocity of the 15-kg block B in 2 second. Neglect the mass of the pulleys and cable. (20%)



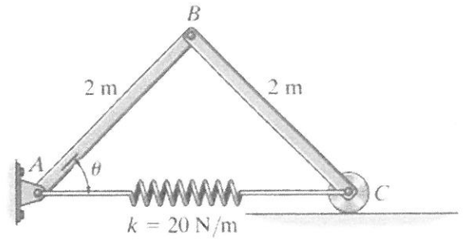
2. Determine the magnitude of force F as a function of time, which must be applied to the end of the cord at A to raise the hook H with a constant speed v = 0.4 m/s. Initially the chain is at rest on the ground. Neglect the mass of the cord and the hook. The chain has a mass of 2 kg/m. (20%)



3. At a given instant the top B of the ladder has an acceleration $a_B = 2$ ft/s^2 and a velocity of $v_B = 4$ ft/s, both acting downward. Determine the acceleration of the bottom A of the ladder, and the ladder's angular acceleration at this instant. (20%)



4. The two 12-kg slender rods are pin connected and released from rest at the position θ=60°. If the spring has an unstretched length of 1.5 m, determine the angular velocity of rod BC, when the system is at the position θ= 0°. Neglect the mass of the roller at C. (20%)



5. The hammer consists of a 10-kg solid cylinder C and 6-kg uniform slender rod AB. If the hammer is released from rest when θ= 90° and strikes the 30-kg block D whenθ= 0°, determine the velocity of block D and the angular velocity of the hammer immediately after the impact. The coefficient of restitution between the hammer and the block is e = 0.6. (20%)