

大葉大學九十二學年度 研究所碩士班 招生考試試題紙

系所	組別	考試科目 (中文名稱)	考試日期	節次	備註
機械工程研究所 碩士班	甲組 丁組	應用力學	4月13日	第三節 13:30~15:00	<ul style="list-style-type: none"> <li>Casio 3600 功能(含)以下計算機</li> <li>共乙頁</li> </ul>

註：• 考生可否攜帶計算機或其他資料作答，請在備註欄註明。

• 詳列計算步驟，否則一概不計分；地表面之重力場強度  $g = 9.81 \text{ m/s}^2$ 。

- Three parallel bolting forces act on the rim of the circular cover plate in Fig. 1. Determine the magnitude and direction of a resultant force equivalent to the given force system and locate its point of application,  $P$ , on the cover plate. (20%)
- Determine the tension in cables  $BC$  and  $BD$  and the reactions at the ball-and-socket joint  $A$  for the mast shown in Fig. 2. (20%)
- The maximum tension that can be developed in the cord shown in Fig. 3 is 500 N. If the pulley at  $A$  is free to rotate and the coefficient of static friction at the fixed drums  $B$  and  $C$  is  $\mu_s = 0.25$ , determine the largest mass of the cylinder that can be lifted by the cord. Assume that the force  $T$  applied at the end of the cord is directed vertically downward, as shown. (20%)
- The 100-kg block  $A$  shown in Fig. 4 is released from rest. If the masses of the pulleys and the cord are neglected, determine the speed of the 20-kg block  $B$  in 2 s. (20%)
- The uniform slender pole shown in Fig. 5 has a mass of 100 kg and a moment of inertia  $I_G = 75 \text{ kg}\cdot\text{m}^2$ . If the coefficients of static and kinetic friction between the end of the pole and the surface are  $\mu_s = 0.3$  and  $\mu_k = 0.25$ , respectively, determine the pole's angular acceleration at the instant the 400-N horizontal force is applied. The pole is originally at rest. (20%)

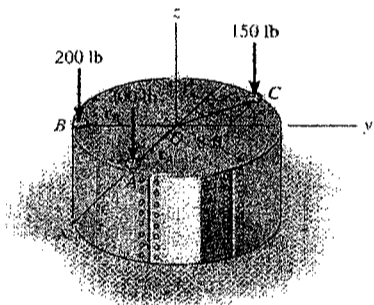


Fig. 1

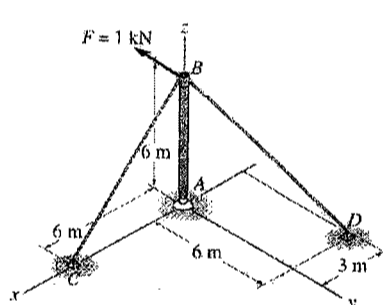


Fig. 2

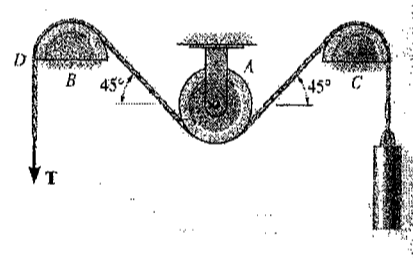


Fig. 3

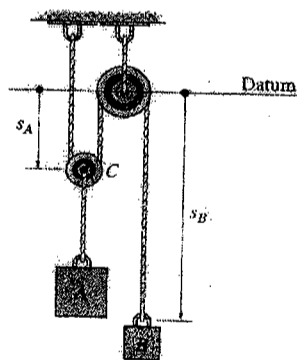


Fig. 4

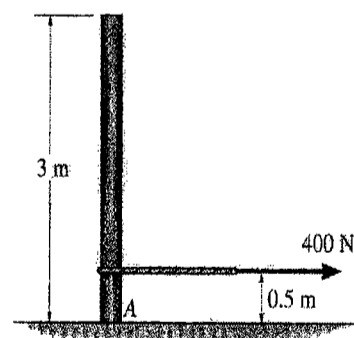


Fig. 5