

國立中山大學 107 學年度碩士暨碩士專班招生考試試題

科目名稱：動力學【機電系碩士班丁組】

題號：438007

※本科目依簡章規定「可以」使用計算機（廠牌、功能不拘）（問答申論題） 共 2 頁第 1 頁

- The motion of a particle is defined by the relation  $x = 2t^3 - 9t^2 + 12t + 10$ , where  $x$  and  $t$  are expressed in meters and seconds, respectively. Determine the time, the position, and the acceleration of the particle when the velocity  $v = 0$ . (20%)
- The acceleration of a package sliding at Point  $A$  is  $3 \text{ m/s}^2$ . Assuming that the coefficient of kinetic friction is the same for each section, determine the acceleration of the package at Point  $B$ . (As shown in Fig. P2) (20%)

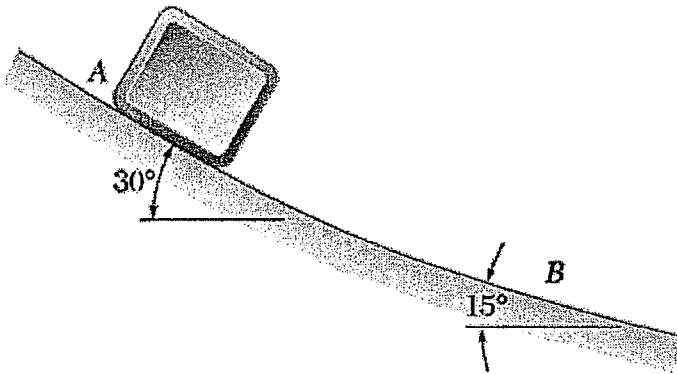


Fig. P2

- A spring is used to stop a 60-kg package which is sliding on a horizontal surface. The spring has a constant  $k = 20 \text{ kN/m}$  and is held by cables so that it is initially compressed 120 mm. Knowing that the package has a velocity of  $2.5 \text{ m/s}$  in the position shown and that the maximum additional deflection of the spring is 40 mm, determine (a) the coefficient of kinetic friction between the package and the surface, (b) the velocity of the package as it passes again through the position shown. (Hint: 本小題問package經spring彈回後經Fig. P3所示之位置之速度). (As shown in Fig. P3) (20%)

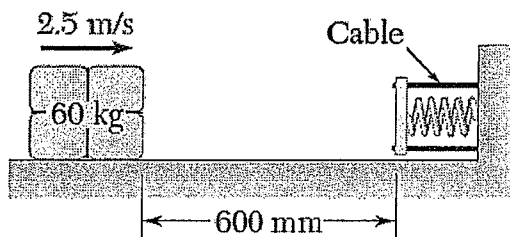


Fig. P3

- A small grinding wheel is attached to the shaft of an electric motor which has a rated speed of 3600 rpm. When the power is turned on, the unit reaches its rated speed in 5 s, and when the power is turned off, the unit coasts to rest in 70 s. Assuming uniformly accelerated motion, determine the number of revolutions that the motor executes (a) in reaching its rated speed, (b) in coasting to rest. (20%)
- Knowing that at the instant shown the velocity of collar  $D$  is  $1.6 \text{ m/s}$  upward, determine (a) the angular velocity of rod  $AD$ , (b) the velocity of Point  $B$ , (c) the velocity of Point  $A$ . (As shown in Fig. P5) (20%)

試題隨卷繳回

背面有題

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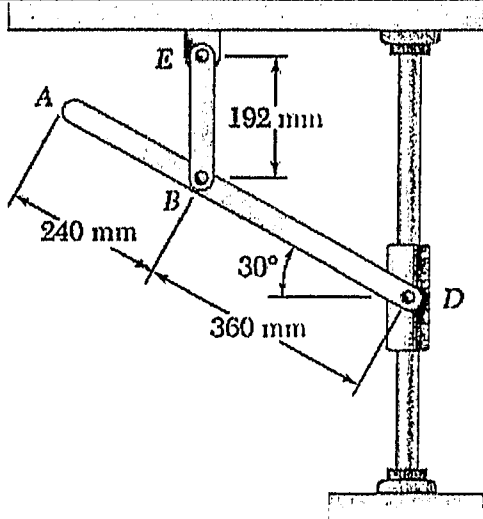


Fig. P5