

國立臺北科技大學九十九學年度碩士班招生考試

系所組別：1120 機電整合研究所乙組

第二節 工程力學 試題

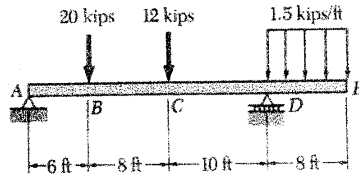
第一頁 共二頁

**注意事項：**

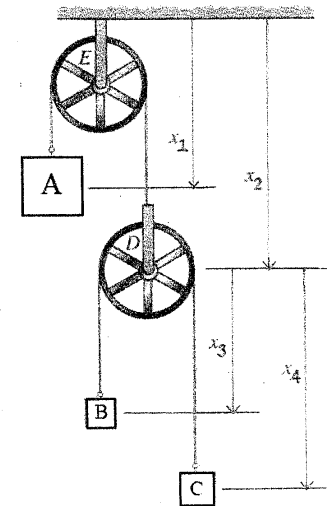
1. 本試題共【4】題，每題【25】分，共100分。
2. 請標明大題、子題編號作答，不必抄題。
3. 全部答案均須在答案卷之答案欄內作答，否則不予計分。

1. Shown in the below figure :

- (a) Draw the shear and bending-moment diagrams for the beam as the loading shown. (15分)
- (b) Determine the maximum shear force and the minimum shear force. (5分)
- (c) Determine the maximum bending moment and the minimum bending moment. (5分)

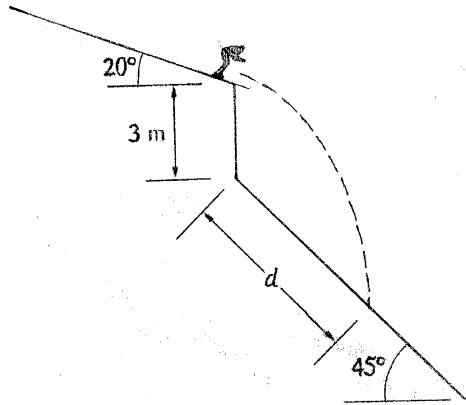


2. Shown in the below figure, a compound machine consists of a system of blocks connected by inextensible strings. The weights of blocks A, B, and C are  $W_A = 200 \text{ lb}_f$ ,  $W_B = 80 \text{ lb}_f$ , and  $W_C = 120 \text{ lb}_f$ , respectively (where  $g = 32.2 \text{ ft/s}^2$ ). The masses and the frictions of the two pulleys are negligible. Determine the accelerations of blocks A, B, and C. (25分)



注意：背面尚有試題

3. Shown in the below figure, the skier leaves the  $20^\circ$  surface at  $10 \text{ m/s}$ .
- Determine the distance  $d$  where he lands. (15 分)
  - The magnitudes of his components of velocity parallel and perpendicular to the  $45^\circ$  surface just before he lands. (10 分)



4. Shown in the below figure, the two crates are released from rest. Their masses are  $m_A = 40 \text{ kg}$  and  $m_B = 30 \text{ kg}$ , and the kinetic coefficient of friction between crate A and the inclined surface is  $\mu_k = 0.15$ . Determine the magnitude of the velocity of the crates when they have moved  $400 \text{ mm}$ . ( $g = 9.81 \text{ m/s}^2$ ,  $m_A$  and  $m_B$  connected by inextensible string, the mass and the friction of the pulley is negligible) (25 分)

