

臺灣綜合大學系統 113 學年度學士班轉學生聯合招生考試試題

科目名稱	應用力學	類組代碼	D37
		科目碼	D3791

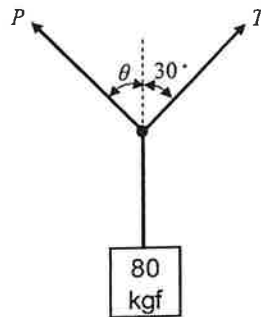
※本項考試依簡章規定所有考科均「不可」使用計算機。

本科試題共計 2 頁

各題配分如試題所列，倒扣分數亦為每題的配分

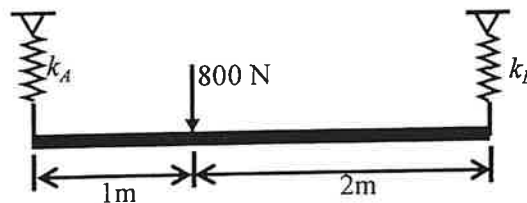
- A. Consider the force equilibrium condition shown below, two cables are used to sustain a block with a weight of 80 kgf. Determine the forces of  $T$ ,  $P$  and angle of  $\theta$  so that  $P$  is a minimum? (單選倒扣)

- Value of  $P =$  (A) 35.6 kgf (B) 40 kgf (C) 69.3 kgf (D) 30 kgf (6%)
- Value of  $T =$  (A) 69.3 kgf (B) 40 kgf (C) 35.6 kgf (D) 30 kgf (6%)
- Value of  $\theta =$  (A)  $45^\circ$  (B)  $30^\circ$  (C)  $60^\circ$  (D)  $75^\circ$  (6%)



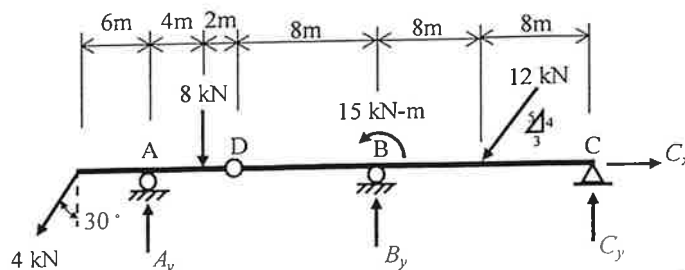
- B. The horizontal beam is supported by springs at its two ends. If the stiffness of the spring of  $k_A = 5 \text{ kN/m}$ , determine the stiffness of  $k_B$  so that the beam remain in horizontal position when a load of 800 N is applied as shown in the below figure. (單選倒扣)

- Value of  $k_B =$  (A) 2.0 kN/m (B) 5.0 kN/m (C) 7.5 kN/m (D) 2.5 kN/m (20%)



- C. Determine the reactions of the following structure. (單選倒扣)

- $A_y =$  (A) 11.46 kN (B) 9.59 kN (C) 12.00 kN (D) 10.00 kN (5%)
- $B_y =$  (A) 8.54 kN (B) 9.60 kN (C) 12.00 kN (D) 7.611 kN (5%)
- $C_x =$  (A) 8.54 kN (B) 9.00 kN (C) 15.46 kN (D) 9.20 kN (5%)
- $C_y =$  (A) 9.60 kN (B) 1.87 kN (C) 2.93 kN (D) 2.59 kN (5%)



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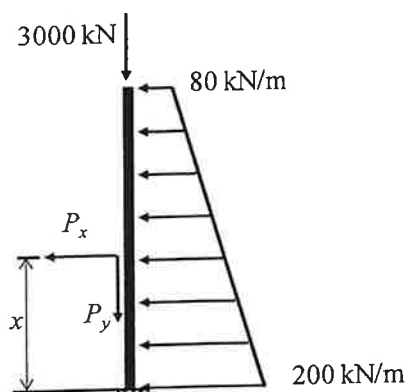
本科試題共計 2 頁

D. A 9m long column is used to supported a vertical force of 3000kN and lateral force due to soil pressure along its side is distributed as shown. Replace this loading by an equivalent resultant force  $P_x$  and  $P_y$ , and specify where it acts along the column. (單選倒扣)

9.  $P_x =$  (A) 1260 kN (B) 4260 kN (C) 2800 kN (D) 3000 kN (7%)

10.  $P_y =$  (A) 1260 kN (B) 3000 kN (C) 4260 kN (D) 2800 kN (7%)

11.  $x =$  (A) 3.50 m (B) 4.50 m (C) 3.75 m (D) 3.86 m (7%)



E. The beam structure together with its shear and bending moment diagram are shown below. Compute the peak values of the shear ( $V_{BL}$ ,  $V_{BR}$ , and  $V_C$ ) and bending moment ( $M_B$  and  $M_{MAX}$ ). Indicate the distance of  $x$  of  $M_{MAX}$ . (單選倒扣)

12.  $V_{BL} =$  (A) -15.31 kN (B) -7.81 kN (C) -7.5 kN (D) 7.5 kN (3%)

13.  $V_{BR} =$  (A) 7.81 kN (B) 7.5 kN (C) -15.31 kN (D) -7.81 kN (3%)

14.  $V_C =$  (A) -10 kN (B) -2.19 kN (C) 2.19 kN (D) -7.81 kN (3%)

15.  $M_B =$  (A) -15.31 kN-m (B) -5.63 kN-m (C) -7.5 kN-m (D) -2.19 kN-m (4%)

16.  $M_{MAX} =$  (A) 0.30 kN-m (B) 7.50 kN-m (C) 2.19 kN-m (D) 0.239 kN-m (4%)

17.  $x =$  (A) 0.219 m (B) 0.333 m (C) 0.438 m (D) 0.110 m (4%)

