

科目：材料力學

適用：土木系(結構與應力組)

考生注意：

1. 依次序作答，只要標明題號，不必抄題。
2. 答案必須寫在答案卷上，否則不予計分。
3. 限用藍、黑色筆作答；試題須隨卷繳回。

本試題

共 2 頁

第 / 頁

編號：331

- (1) Two rigid bars are connected to each other by two linearly elastic springs. Before loads are applied, the lengths of the springs are such that the bars are parallel and the springs are without stress. Derive a formula for the displacement δ_4 at point 4 when the load P is applied at joint 3 and moment PL is applied at joint 1, as shown in the Figure

1. Assume that the bars rotate through very small angles under the action of the load P . (20%)

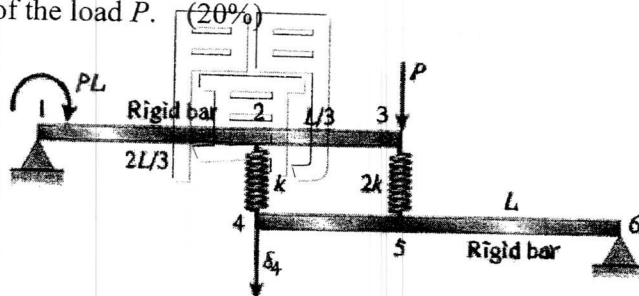


Figure 1

- (2) A bar AB having length L and axial rigidity EA is fixed at end A (see Figure 2). At the other end a small gap of dimension s exists between the end of the bar and a rigid surface. A load P acts on the bar at point C , which is two-thirds of the length from the fixed end. If the support reactions produced by the load P are to be equal in magnitude, what should be the size s of the gap? (25%)

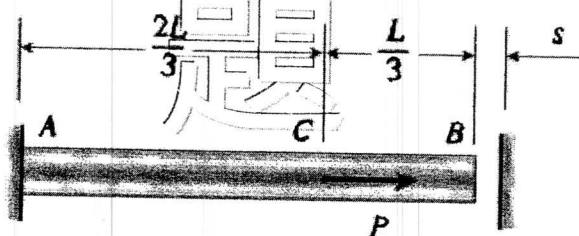


Figure 2

科目：材料力學

適用：土木系(結構與應力組)

考生注意：

1. 依次序作答，只要標明題號，不必抄題。
2. 答案必須寫在答案卷上，否則不予計分。
3. 限用藍、黑色筆作答；試題須隨卷繳回。

本試題

共 2 頁

第 2 頁

編號：331

- (3) The simple beam AB shown in the Figure 3 is subjected to a concentrated load P and a clockwise couple $M_1 = PL/3$. Draw the shear-force diagram (15%) and bending-moment diagram (15%) for this beam.

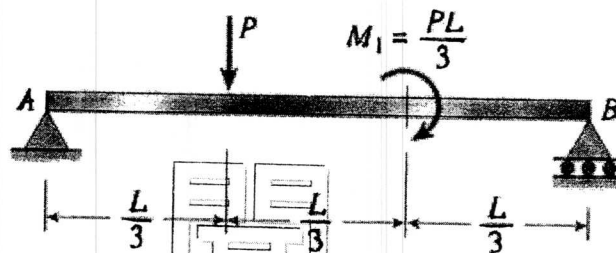


Figure 3

- (4) A beam $ABCDE$ has simple supports at B and D and symmetrical overhangs at each end (see Figure 4). The center span has length L and each overhang has length b . A uniform load of intensity q acts on the beam. Determine the ratio b/L so that the deflection δ_C at the midpoint of the beam is equal to the deflections δ_A and δ_E at the ends. (25%)

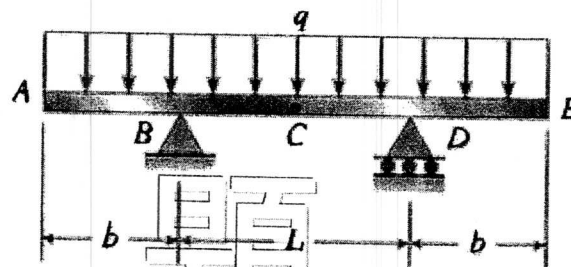


Figure 4