

# 淡江大學八十八學年度碩士班招生考試試題

系別：航空及太空工程學系

科目：材料力學

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本試題雙面印製

1. Two steel shafts ( $G=80 \text{ GPa}$ ) are connected by gears and subjected to a torque  $T = 400 \text{ N-m}$ . Given  $d_1 = 40 \text{ mm}$  and  $d_2 = 30 \text{ mm}$ , please determine
- (i) the angle of rotation in degrees at D.
  - (ii) the maximum shearing stress in each shaft.

(25%)

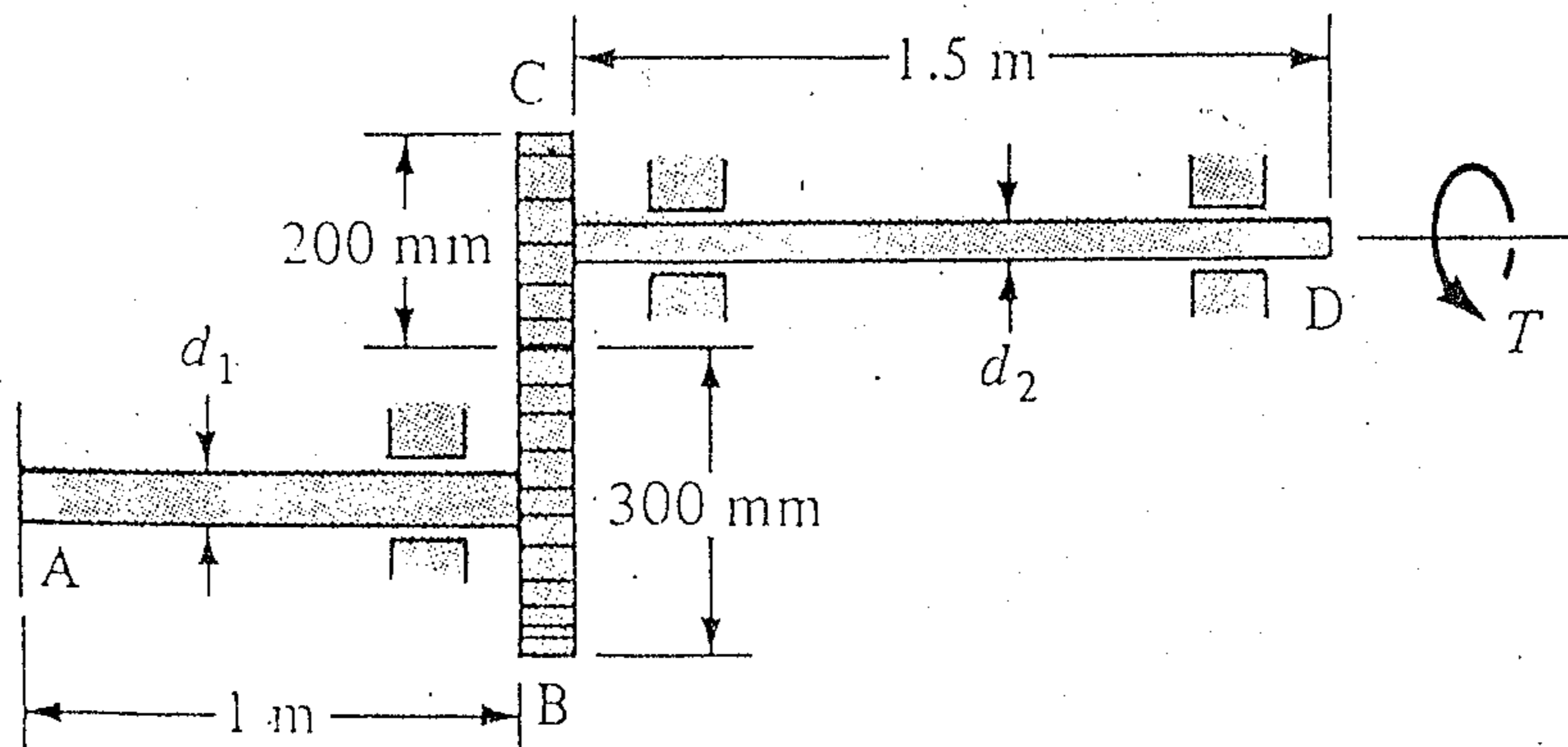


Fig. 1

2. A triangular plate is subjected to stresses as shown in Fig. 2. Please determine  $\sigma_x$ ,  $\sigma_y$ , and  $\tau_{xy}$  and sketch the results on a properly oriented element.

(25%)

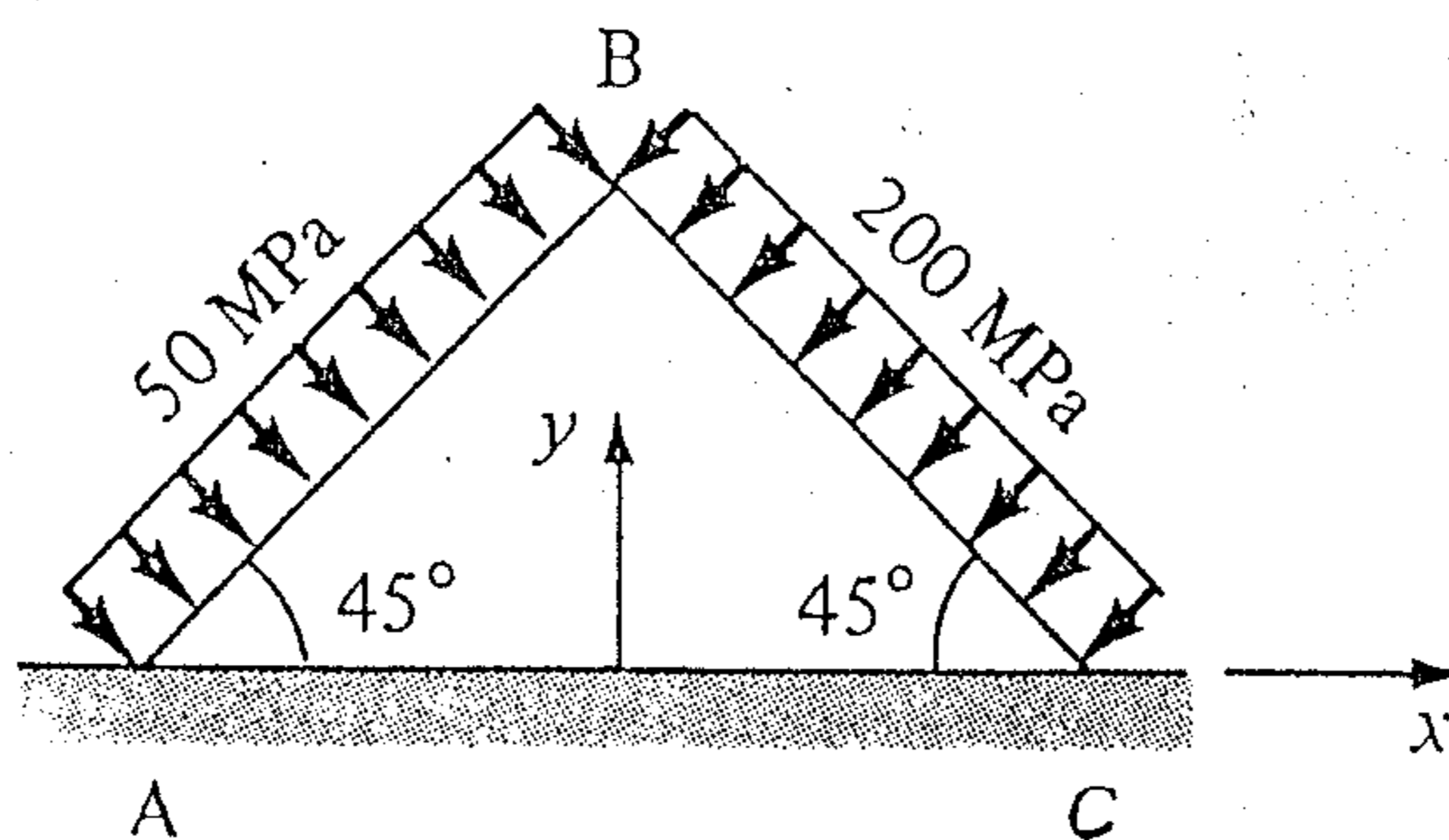


Fig. 2

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3. A beam is loaded as shown in Fig. 3, please determine the reactions at each support.

(25%) Assume  $E$  = Young's modulus,  $I$  = moment of inertia and  $EI$  = constant for the beam.

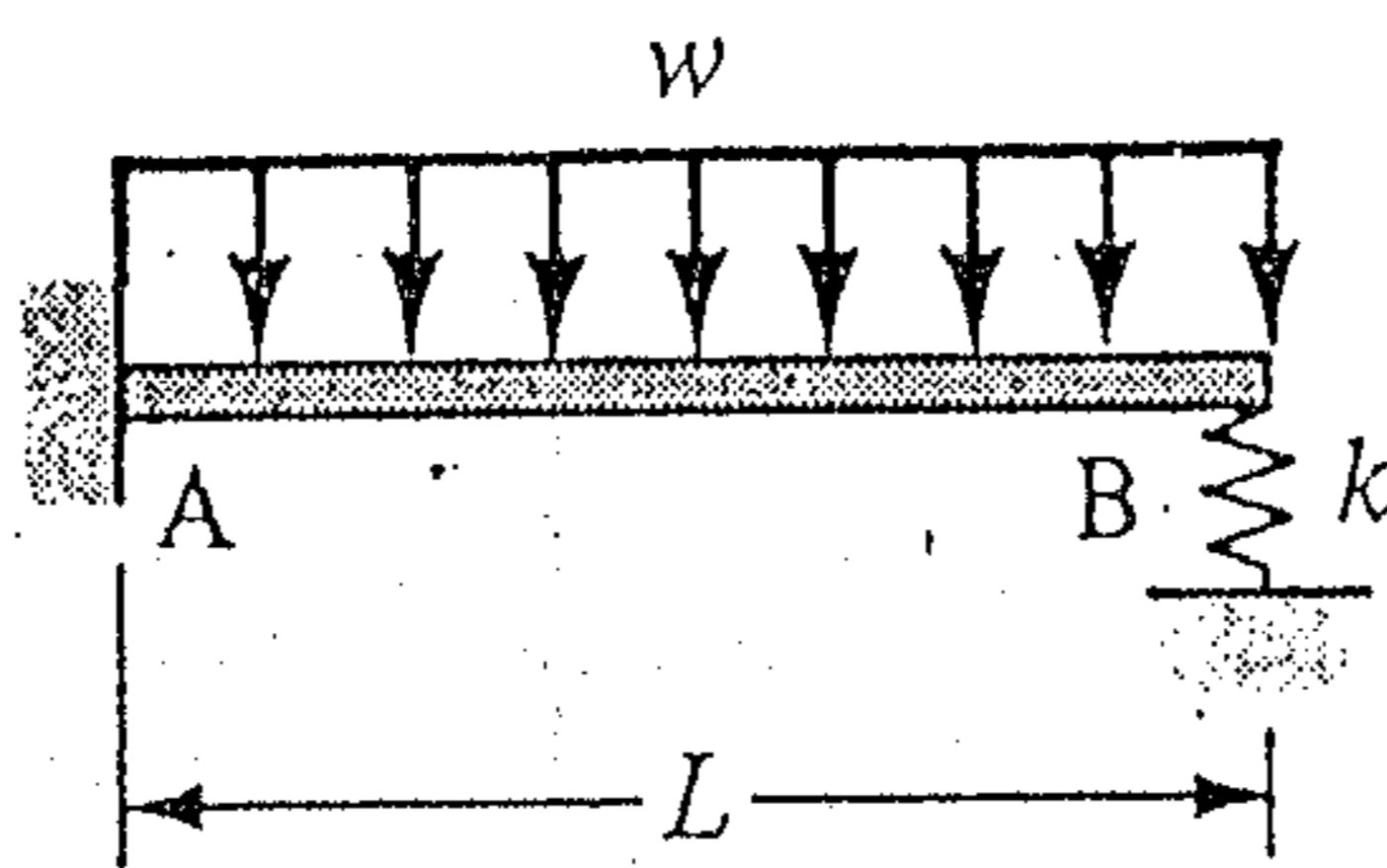


Fig. 3

4. For the truss and loading shown in Fig. 4, please obtain the vertical deflection at point C. Assume that all members are of equal axial rigidity  $AE$ .

(25%)

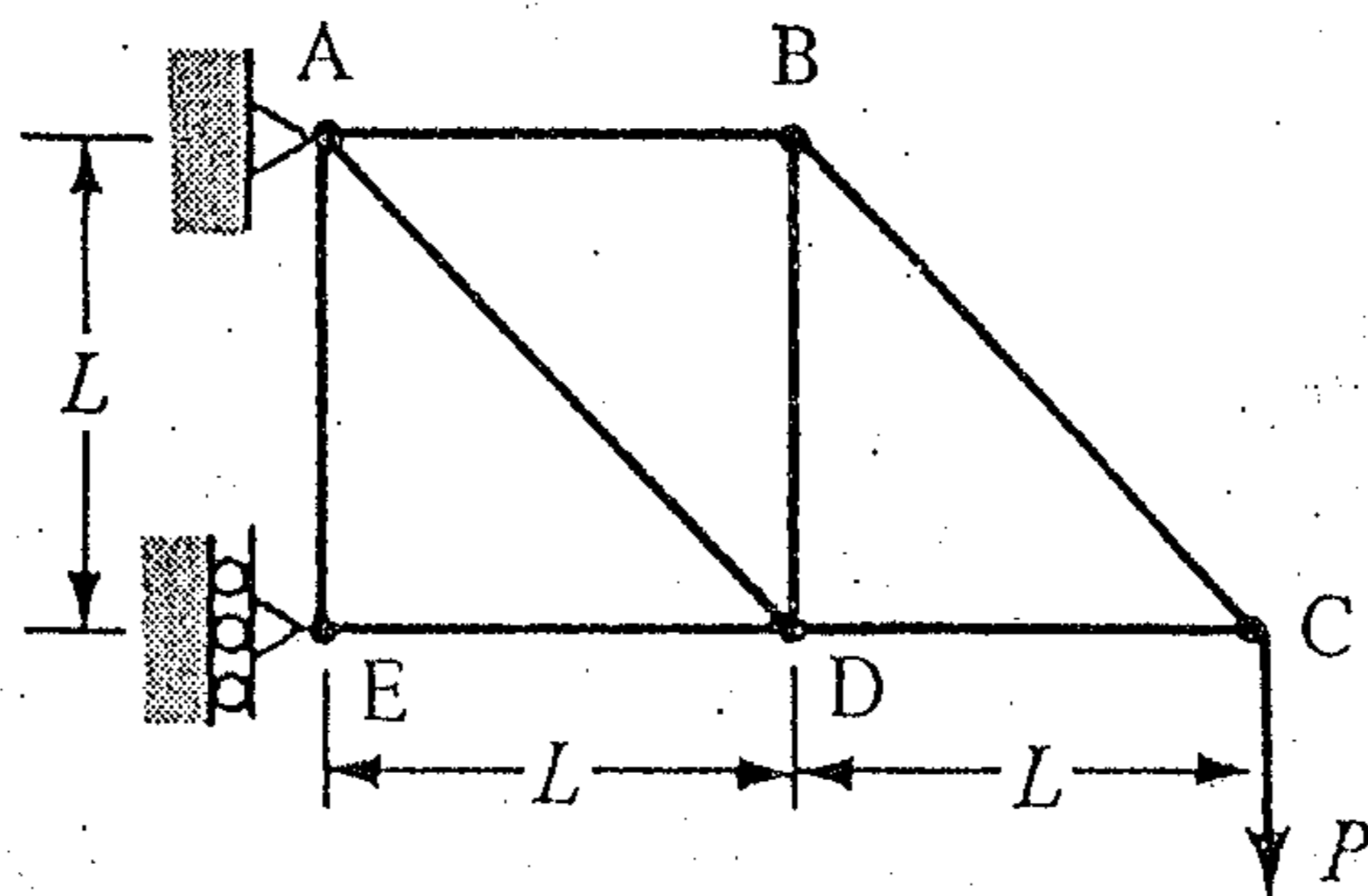


Fig. 4