

國立屏東科技大學 九十五 學年度 碩士班暨碩士在職專班招生考試  
材料力學

1. The simple beam AB shown in Fig. 1 is subjected to a concentrated load  $P$  and a couple  $M_1 = PL/4$ . Draw the shear-force and bending moment diagrams for this beam. (25 分)
2. A steel bar of solid circular cross section is subjected to an axial tensile force  $T = 26$  kN and a bending moment  $M = 2.7$  kN-m (see Fig. 2). Based on an allowable stress in tension of 125 MPa, determine the required diameter  $d$  of the bar. (Disregard the weight of the bar itself.) (25 分)
3. A bar AB of a solid circular cross section as shown in Fig. 3 is loaded by a distributed torque having intensity  $t(x)$  per unit length that varied linearly from a maximum value  $t_A$  at end A to zero at end B. The diameter is  $d$  and length is  $L$ . (a) What is the maximum shear stress in the bar? (b) What is the angle of twist at end B? (25 分)
4. Determine the angle of rotation  $\theta_B$  and the deflection  $\delta_B$  at the free end for a cantilever beam AB subjected to a uniform load of intensity  $q$ , as shown in Fig. 4. The beam has length  $L$  and constant flexural rigidity  $EI$ . (25 分)

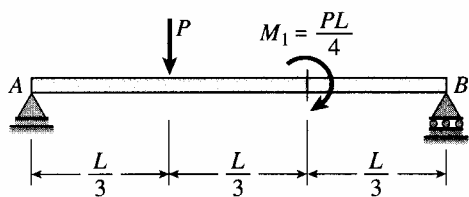


Fig. 1

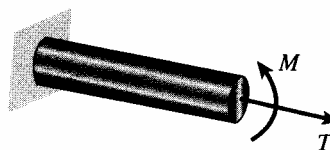


Fig. 2

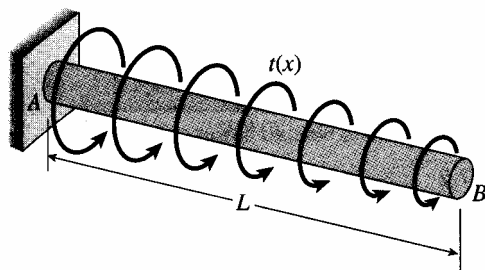


Fig. 3

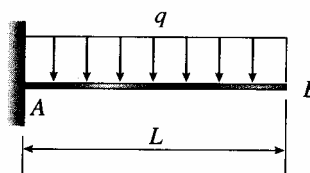


Fig. 4