Bronze
E = 105 GPa
12-mm diameter

Aluminum
E = 70 GPa
9-mm diameter

4 m

2.5 m

0.6 m

1. Collar D is released from rest in the position shown and is stopped by a small plate attached at end C of the vertical rod ABC. Determine the mass of the collar for which the maximum normal stress in portion BC is 125 MPa using energy balance

2. Using the method of work and energy, determine the deflection at point D caused by the load P.
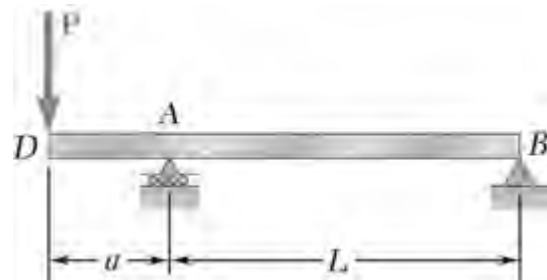
3. Each member of the truss shown is made of steel; the cross-sectional area of the member BC is 800 mm2 and for all other members the cross-sectional area is 400 mm2. Using E = 200 GPa, determine the deflection of point D caused by the 60 kN load shown, using the method of work energy equivalence.
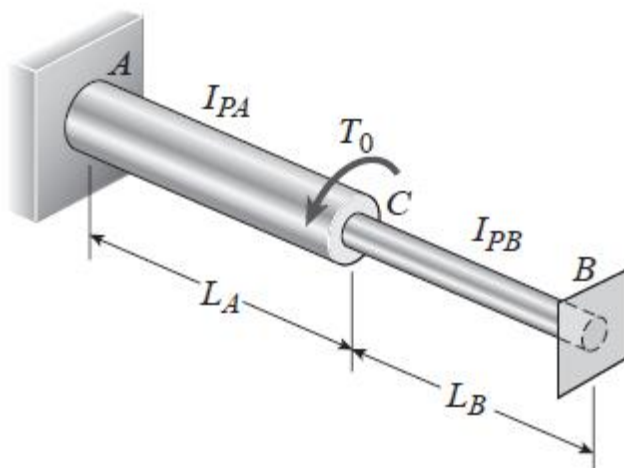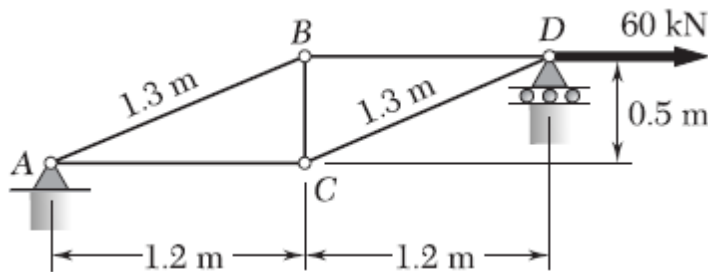
4. A statically indeterminate stepped shaft ACB is fixed at ends A and B and loaded by a torque T0 at point C. The two segments of the bar are made of the same material, have lengths LA and LB, and have polar moments of inertia I_{PA} and I_{PB}. Determine the angle of rotation of the cross section at C by using work energy equivalence.