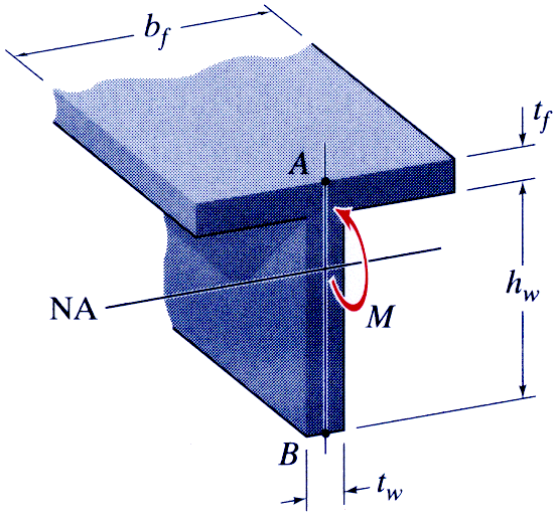
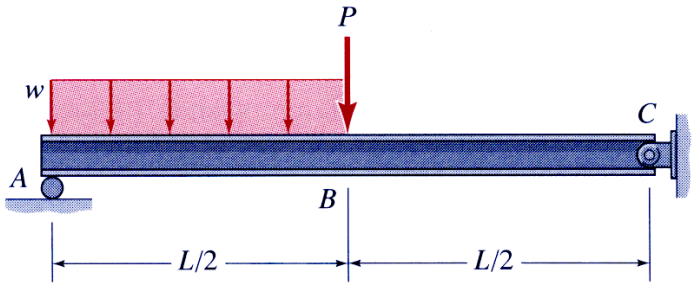
BE 110C F02 Test 2 Name: _____

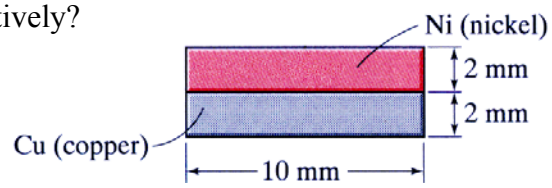
1. Determine the flexural stresses at points *A* and *B* in the cross section if the bending moment at this section is M = 10 kip-ft. The dimensions of the cross section are $b_f = 8$ in., $t_f = 2$ in., $h_w = 6$ in., and $t_w = 2$ in.



2. The simply-supported bean is subjected to a concentrated load of $P = 40$ kips at the center of its span $L = 8$ ft and a uniformly distributed downward load of intensity $w = 5$ kips/ft over the half-span AB. The allowable stress (magnitude) in tension or compression is $F_{allow} = 20$ ksi. From the attached beam table, select the lightest wide-flange steel beam that may be used for this application.



3. The two metals are copper and nickel, whose elastic moduli are E_c = 120 Gpa and E_n = 210 Gpa, respectively. If the strip is subjected to a bending moment M = 2 Nm, what are the maximum stresses $\sigma_{c,max}$ and $\sigma_{n,max}$ in the copper and nickel, respectively?



4. Four 30 mm × 180 mm (actual dimensions) boards are attached together by wood screws to form a box beam. If each screw has an allowable shear force capacity of V_s = 1 kN and the beam is to be subjected to a vertical shear force V = 5 kN, what is the maximum permissible longitudinal spacing, s, of the screws?