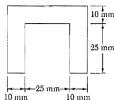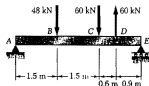※ 考生請注意：本試題 ☑可 □不可 使用計算機

1. (10pts) The brass rod AD is fitted with a jacket that is used to apply a hydrostatic pressure of 48 MPa to the 240-mm portion BC of the rod. Knowing that E = 105 GPa and ν = 0.33, determine (a) the change in the total length AD, (b) the change in diameter of portion BC of the rod.
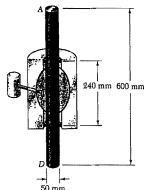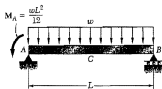

2. (10pts) Determine the plastic moment of a steel beam of the cross section shown, assuming the steel to be idealized elastoplastic with a yield strength of 240 MPa.

3. (10pts) Determine the maximum value of the bending moment in the beam.

4. (10pts) For the beam and loading shown, determine the deflection at the midpoint C.


$M_A = \dfrac{wL^2}{12}$

（背面仍有題目,請繼續作答）

※ 考生請注意：本試題 ☑可 □不可 使用計算機

5.(20pts) Two solid steel shafts are fitted with flanges which are then connected by fitted bolts so that there is no relative rotation between the flanges. Knowing that G = 77 GPa, determine the maximum shearing stress in each shaft when a 500 N·m torque is applied to flange B.
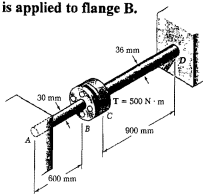
6.(20pts) The pressure tank shown has a 3/8-in. wall thickness and butt-welded seam forming an angle β = 25° with a transverse plane. Determine the largest allowable gage pressure, knowing that the allowable normal stress perpendicular to the weld is 18 ksi and the allowable shearing stress parallel to the weld is 10 ksi.
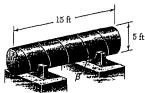
7.(20pts) Three forces are applied to a steel post as shown. Determine the normal and shearing stresses at point H.