CVG2140 – Assignment No. 7 (Shear & Torsion)

(Due Date: Tuesday, March 31st, 2015)

Problem 1. The wood beam shown in Fig. 1 has an allowable shear stress of τ_{allow} = 7 MPa. Determine the maximum shear force *V* that can be applied to the cross section.

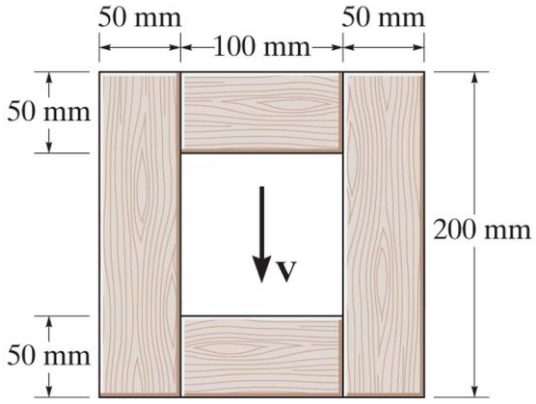

Fig. 1

Problem 2. Determine the absolute maximum shear stress in the T-beam shown in Fig. 2, as well as the maximum shear stress in the cross section that passes through point *C*.

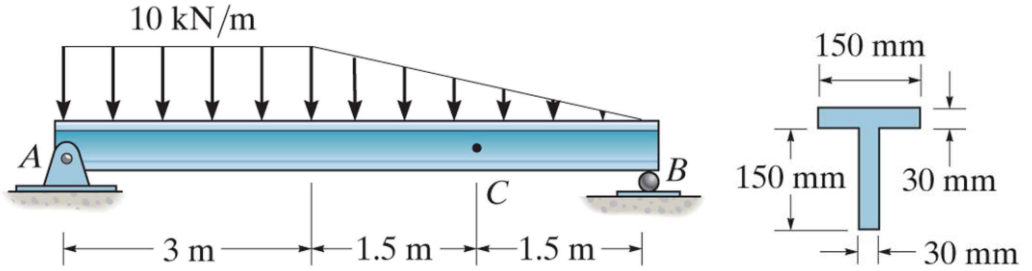

Fig. 2

Problem 3. The 60-mm-diameter solid shaft in Fig. 3 is subjected to the distributed and concentrated torsional loadings shown. Determine the absolute maximum and minimum shear stresses on the outer surface of the shaft and specify their locations, measured from the fixed end *A*.

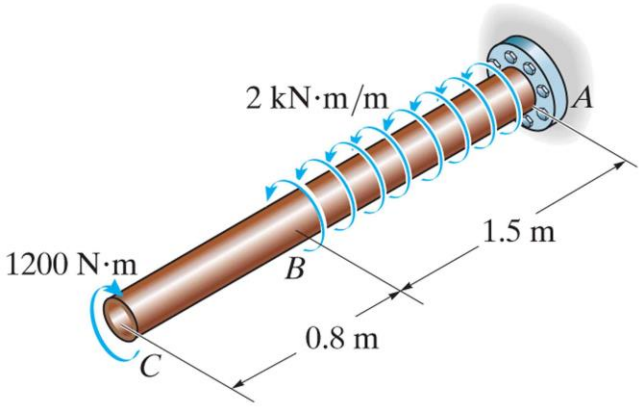

Fig. 3

Problem 4. The A-36 steel assembly in Fig. 4 consists of a tube having an outer radius of 1 in and a wall thickness of 0.125 in. Using a rigid plate at *B*, it is connected to the solid 1-in-diameter shaft *AB*. Determine the rotation of the tube's end *C* if a torque of 200 lb·in is applied to the tube at this end. The end *A* of the shaft is fixed. $G = 11\times10^6$ psi.

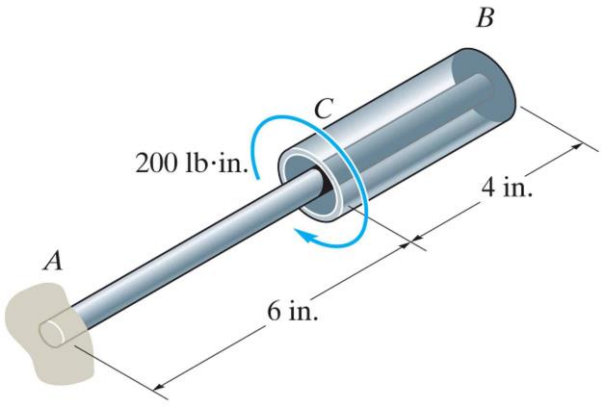

Fig. 4