
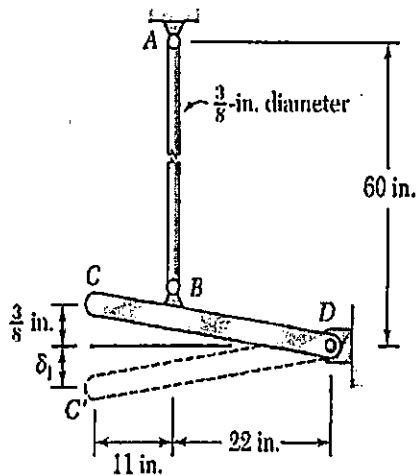


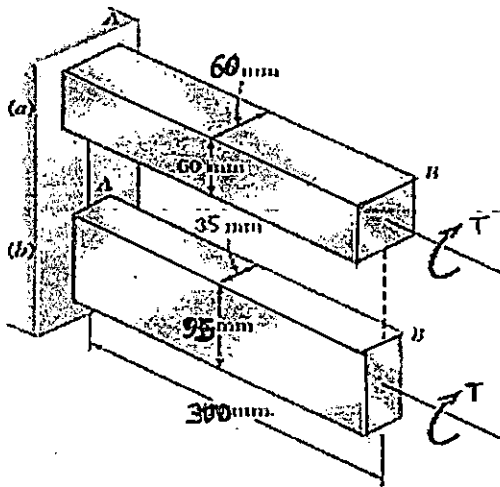
Mansoura University		Academic Year 2019/2020
Faculty of Engineering		Course Name: Stress Analysis (PDE281)
Total Grade: 20 marks		Level: (200) Dept.: BME
No. of pages: 1		Time Allowed: 60 min.
1St term Mid-Term Exam		

PROBLEM 1:



Rod AB is made of a mild steel that is assumed to be elastoplastic with $E = 29 \times 10^6$ psi and $\sigma_y = 36$ ksi. After the rod has been attached to the rigid lever CD , it is found that end C is $\frac{3}{8}$ in. too high. A vertical force Q is then applied at C until this point has moved to position C' . Determine the required magnitude of Q and the deflection δ_1 if the lever is to *snap* back to a horizontal position after Q is removed.

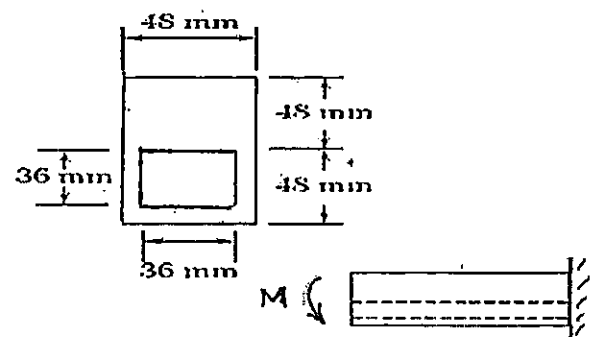
PROBLEM 2



Each of the two aluminium bars shown is subjected to a torque of magnitude $T = 1800$ N · m. Knowing that $G = 26$ GPa, determine for each bar the maximum shearing stress and the angle of twist at B .

PROBLEM 3

Knowing that for the extruded beam shown the allowable stress is 120 MPa in tension and 150 MPa in compression, determine the largest couple M that can be applied.



Best wishes

Prof. Dr. Abdou Abdel-Samad