CIVIL ENGINEERING DEPARTMENT

CE 203 STRUCTURAL MECHANICS I
First Semester 2012 / 2013 (**121**)
## HOMEWORK NO. 2

- **Textbook Sections Covered:** **1.4 – 1.7 , Shear Stress & Allowable Stress**

- **DUE DATE**: **Monday 17 September 2012**

1- Use the figure for problem 1- 48 in the textbook (p. 41) . Determine the largest value of P that can be safely applied. For the pin at A : allowable shear stress is 30 MPa and the diameter is 20 mm. For each of the pins at B and C : allowable shear stress is 20 MPa and the diameter is 25 mm.

2- Solve problem 1-75 in the textbook (p. 55) using the given revised data : Ultimate shear stress for the bolts is 400MPa , and the factor of safety is = 2.

3- Solve problem 1-87 in the textbook (p. 57) using the given revised data : Allowable bearing stress for oak is 35 MPa & allowable bearing stress in pine is 20 MPa.

4- The rod AC has a uniform circular cross section. Determine the smallest diameter for rod AC that can be safely used. Given : Allowable normal stress for segment AB is 80 MPa & allowable normal stress for segment BC is 130 MPa.
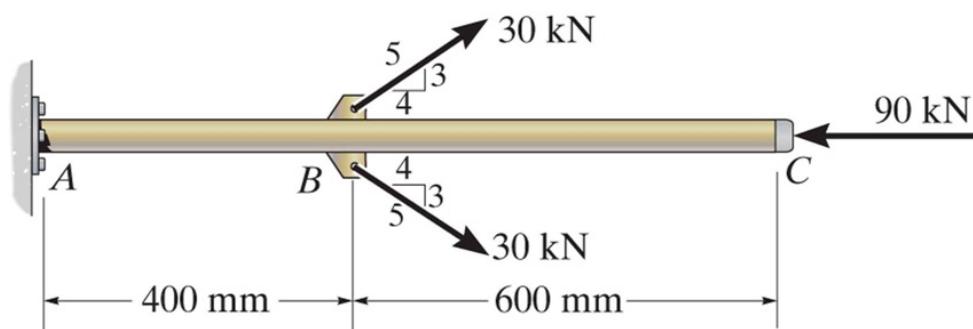
5- The given structure consists of a rigid rod AC and 3 cables. Determine the largest load P that can be safely applied. Given : allowable normal stress for each cable is 20 MPa.

$A_{CD} = 20 \ mm^2$

2 m

$A_{AB} = 32 \ mm^2$

1 m $A_{EF} = 50 \ mm^2$