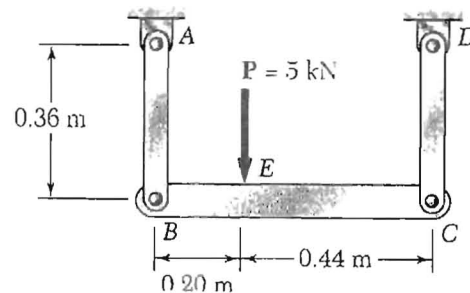


※ 考生請注意：本試題 可 不可 使用計算機

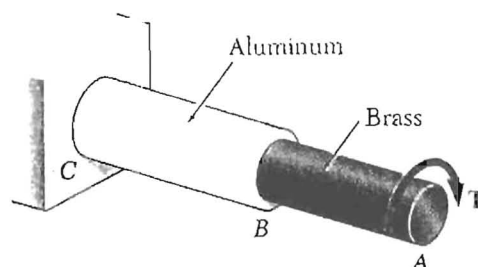
1. (10pts) Please define the following terms:

(a) yield strength at 0.2% offset, (b) generalized Hooke's Law for a homogeneous and isotropic material under most general stress condition, (c) three-point bending, (d) shear center, (e) von Mises yield criterion.

2. (15pts) Each of the links AB and CD is made of aluminum ($E = 75 \text{ GPa}$) and has a cross-sectional area of 125 mm^2 . Knowing that they support the rigid member BC, determine the deflection of point E.



3. (15pts) The solid rod BC has a diameter of 30 mm and is made of an aluminum for which the allowable shearing stress is 25 MPa. Rod AB is hollow and has an outer diameter of 25 mm; it is made of a brass for which the allowable shearing stress is 50 MPa. Determine (a) the largest inner diameter of rod AB for which the factor of safety is the same for each rod, (b) the largest torque that may be applied at A.



4. (20pts) For the beam and loading shown, design the cross section of the beam, knowing that the grade of the timber used has an allowable normal stress of 12 MPa.

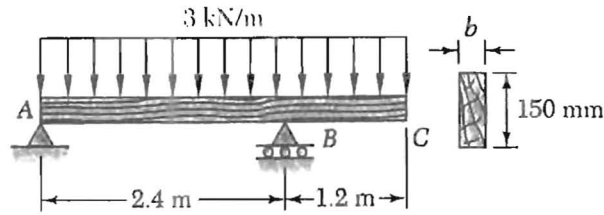
(背面仍有題目,請繼續作答)

系所組別： 工程科學系丙、己組

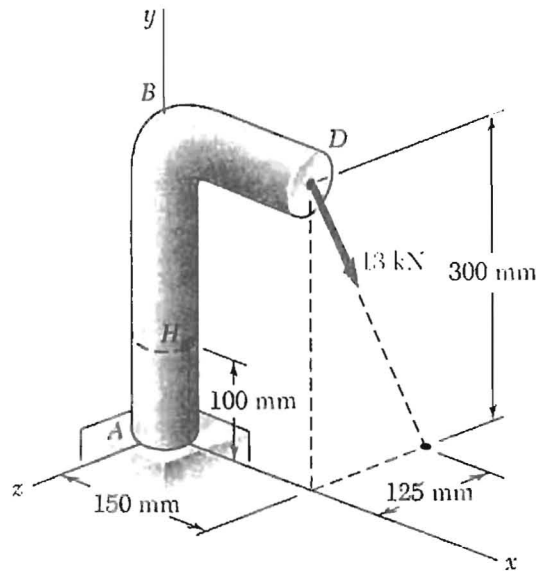
考試科目： 材料力學

考試日期： 0219， 節次： 2

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5. (20pts) A 13-kN force is applied as shown to the 60-mm-diameter cast-iron post ABD. At point H, determine (a) the principal stresses and principal planes, (b) the maximum shearing stress.



6. (20pts) For the beam and loading shown, determine (a) the reaction at the roller support, (b) the deflection at point C.

