

UNIVERSITY OF REGINA
FACULTY OF ENGINEERING



ENIN 241 - Mechanics of Deformable Solids

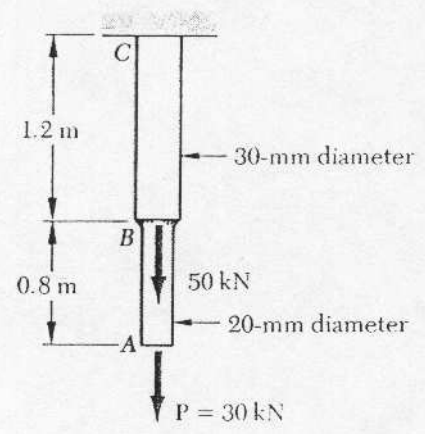
MID-TERM EXAM

Time: 50 min.
Date: February 17, 1995

Total Marks: 100
Instructor: S. Gong

Problem 1 (25 Marks)

Two solid circular rods are welded together at *B* as shown. Determine the normal stress at the midpoint of each rod.

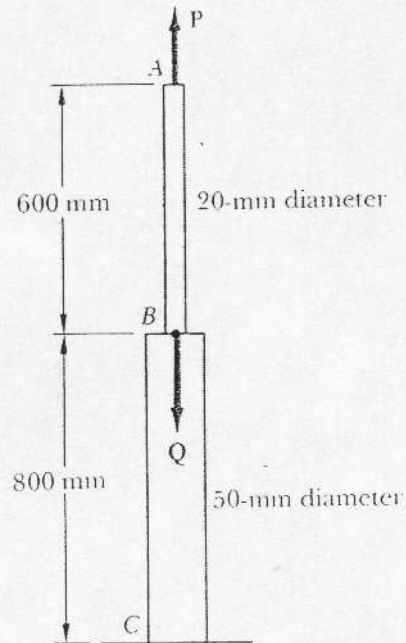


Problem 2 (25 Marks)

A steel control rod which is 2.8 m long must not stretch more than 2 mm when a 9-kN tensile load is applied to it. Knowing that $E = 200$ GPa, determine (a) the smallest diameter rod which should be used, (b) the corresponding normal stress caused by the load.

Problem 3 (30 Marks)

The steel rod ABC is subjected to a known downward load $Q = 150 \text{ kN}$ and a variable upward load P . Assuming that $E = 200 \text{ GPa}$, determine (a) the magnitude of P for which the deflection of A is zero, (b) the corresponding deflection of B .



Problem 4 (20 Marks)

Each of the rods BD and CE is made of brass ($E = 105 \text{ GPa}$) and has a cross-sectional area of 200 mm^2 . Determine the deflection of end A of the rigid member ABC caused by the 2.5-kN load.

