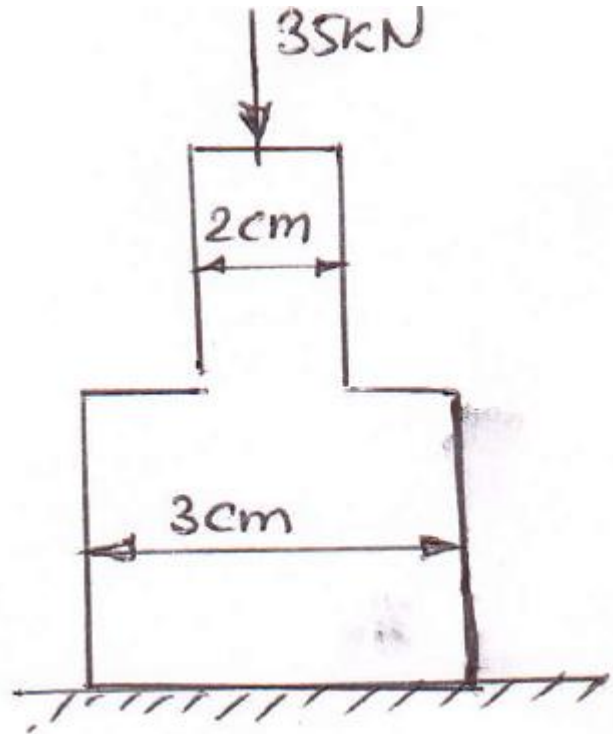


Philadelphia University
Faculty of Engineering
Dep. Of Mechanical Engineering
Quiz:1 .C,2^dsem. 2015
Solid Mech.

Dr. Nabil Musa

A stepped bar shown in figure is subjected to an axially applied compressive load of 35 kN. Find the maximum and minimum stress.



$$P = 35 \times 10^3 \text{ N.}$$

$$D_1 = 2 \text{ cm} = 20 \text{ mm}$$

$$A_1 = \frac{\pi}{4} (20)^2 = 100\pi \text{ mm}^2$$

$$A_2 = \frac{\pi}{4} (30)^2 = 225\pi \text{ mm}^2$$

$$\sigma_{\max} = \frac{35 \times 10^3}{100\pi} = 111,408 \text{ MPa}$$

$$\sigma_{\min} = \frac{35 \times 10^3}{225\pi} = 49,5146 \text{ N/mm}^2$$