Tutorial Session 9 Homework: Lower Bound Theorem

Mentor Guide Knowledge & Skills Questions

1.14 Describe qualitatively the influence of plastic yielding on the stress distribution in simple example cases, (i) for primary loads, (ii) for secondary loads.

1.15 Describe qualitatively why a structure under primary loading has an ultimate (plastic collapse) load.

1.16 State the lower bound theorem for the plastic limit load.

Algebraic Questions

1) Find lower bound collapse solutions for a rectangular section bar under axial end load and bending.

2) Find lower bound collapse solutions for,

EITHER A thin pipe under axial end load and global bending;

OR A thin pipe under internal pressure and global bending (Mises)

(Obviously a lower bound is zero! No marks for that – please give a useful lower bound).