

Mid-Term Exam

Total Marks: 30

No. of Questions: 2 (Attempt all questions)

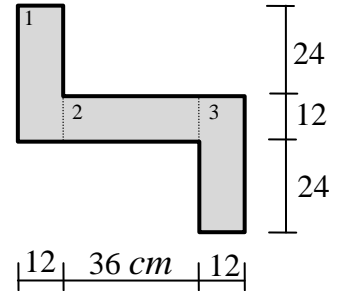
Student Name: _____

Code: _____

Question (1): (15 Marks)

For the shown cross-section, determine the following:

- The location of the centroid.
- The moments of inertia about the centroidal axes.
- The direction of the principal axes.
- The principal moments of inertia.



Solution:

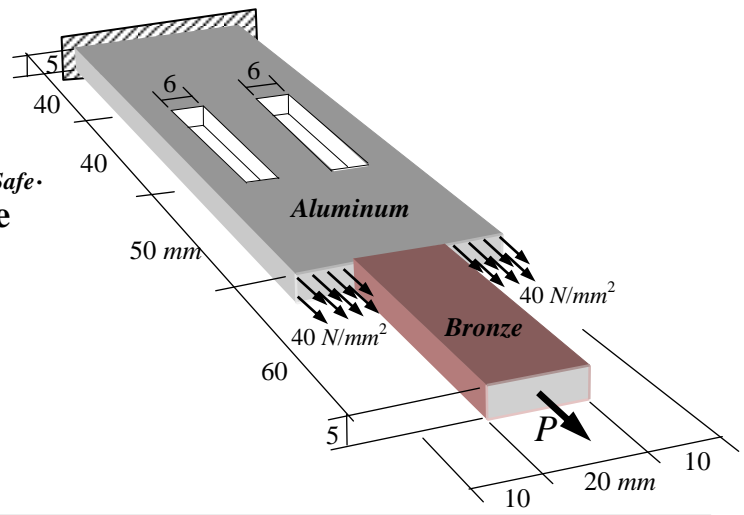
Question (2): (15 Marks)

A bar of variable cross-section is subjected to axial loads as shown.

- (a) Determine the maximum safe value of P_{Safe} .
- (b) Determine the deformation of the **Bronze** part **only** due to P_{Safe} calculated in (a)

Given Data:

Allowable stress for bronze = 100 MPa
Allowable stress for aluminum = 90 MPa
 $E = 2.58 \text{ GPa}$



Solution: