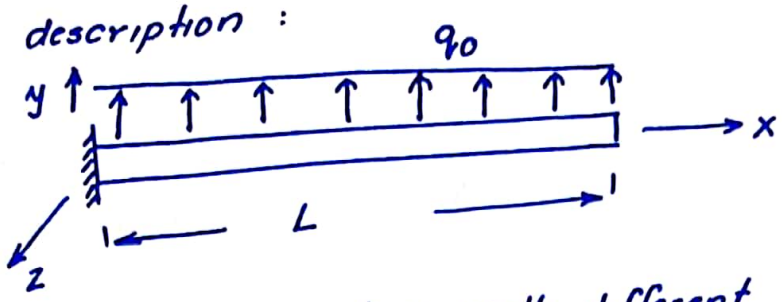
ASSIGNMENT (Bending)

Beam description :



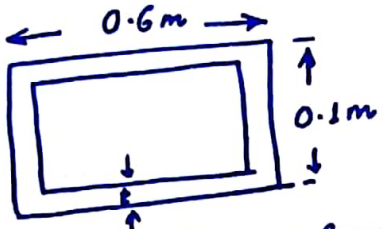
$L = 6\ m$

Material :

$E = 70\ GPa$

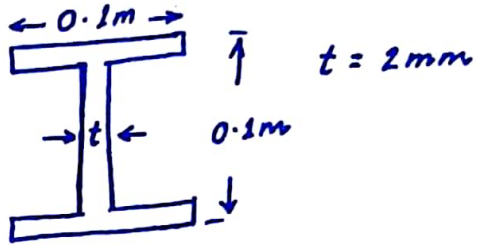
$\nu = 0.3$

Uniform cross-section with different geometries as given :

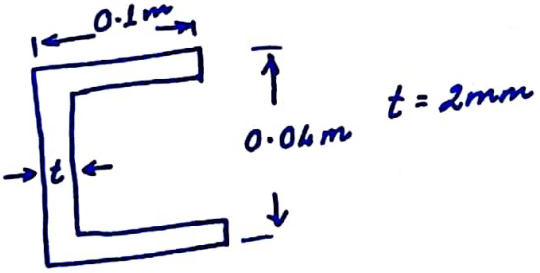


t = thickness = 2mm

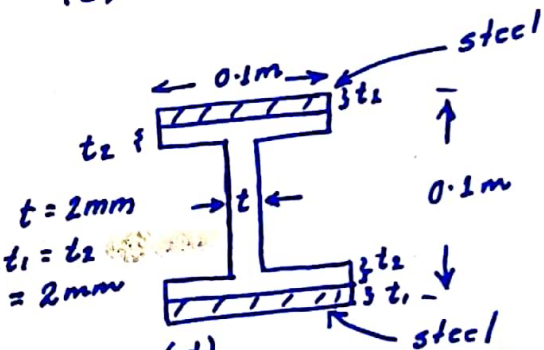
(a)



(b)



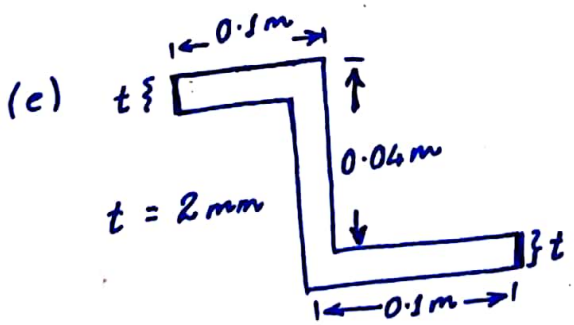
(c)

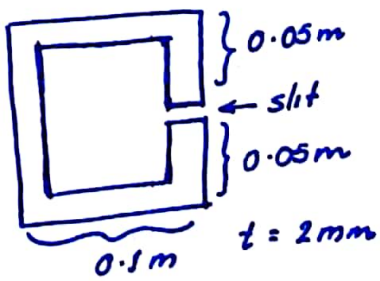


(d)

$E_{steel} = 200\ GPa$

$\nu_{steel} = 0.3$





Q1 : If $q_0 = 3000\ N/m$, then draw (a) Shear force distribution (b) Bending moment distribution

Q2 : At $x = 0$, $x = 3m$ obtain the bending stress distribution for the cross-sections (a) – (f). Determine location and value of $\sigma_{xx}|_{max}$

Q3: (a) At $x = 0, 3m$ obtain the shear flow in the cross-section
Give variation of $q_{xs}(s)$ for the section.

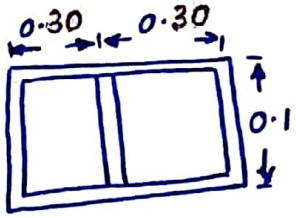
(b) Find shear centre for each case

(c) Show that the shear flow indeed gives the shear force as the resultant.

(d) Find location and value of maximum

Q4: For the mult-celled section shown, obtain the bending stress distribution and shear flow.

$t = 2mm$



* SUBMIT (by 3rd Nov.) : Q1 ; Q2 for sections (b), (f); Q3 for sections (a), (b), (e), (f) ;