Class: 2nd
Subject: Strength of Materials
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Al-Mustaqbal University College
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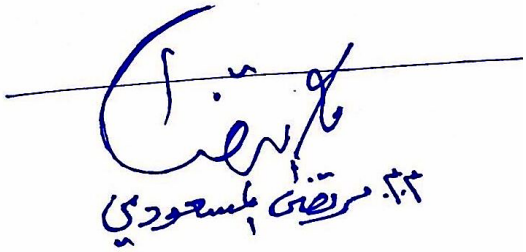
Strength of Materials

Second Stage

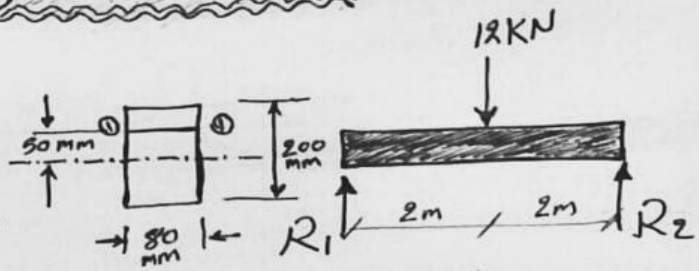
M.Sc Murtadha Mohsen Al-Masoudy



Shearing stress in beams

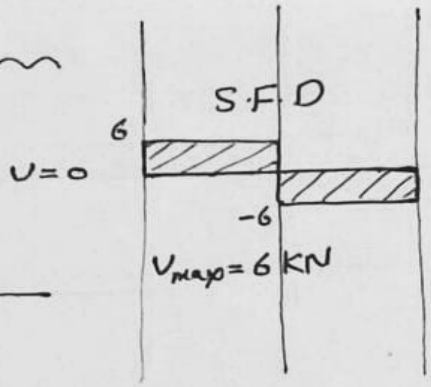
Ex.1

Determine:
1- The max. shearing stress.
2- The shearing stress at the Level shown for the section of max. shearing force.



Sol.

$$R_1 = R_2 = \frac{12}{2} = 6\,KN$$



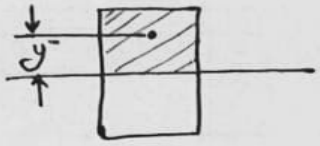
① $\tau = \frac{V \cdot Q}{I_{N.A} \cdot b}$

τ_{max} at the n.A

$V = 6\,KN$.

$b = 0.08\,m$

$$I_{N.A} = \frac{b.h^3}{12} = \frac{0.08*(0.2)^3}{12}$$



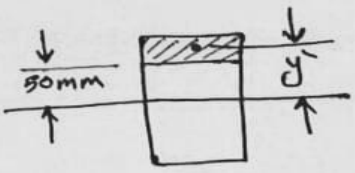
$$Q = \acute{A} \cdot \bar{y}$$

$$= \left[0.08 * \frac{0.2}{2}\right] * \left(\frac{1}{2} * \frac{0.2}{2}\right) \Rightarrow \therefore \boxed{\tau_{max.} =}$$

②

$V = 6KN$; $b = 0.08$

$$I_{N.A} = \frac{0.08 \cdot (0.2)^3}{12}$$



$$Q = \acute{A} \cdot \bar{y} \Rightarrow$$

$$\acute{A} = \left(\frac{0.2}{2} - 0.05\right) * 0.08$$

$$\bar{y} = 0.05 + \left[\left(\frac{0.2}{2} - 0.05\right)/2\right]$$

$$\therefore \boxed{\tau = \frac{V \cdot Q}{I_{N.A} \cdot b} =}$$