



Class: 2nd
Subject: Strength of Materials
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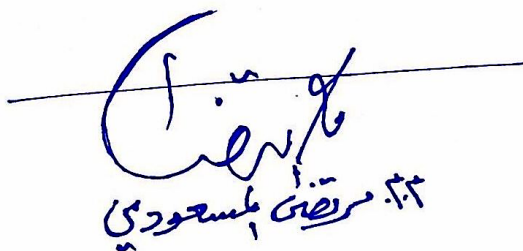
Al-Mustaqbal University College
Air Conditioning and Refrigeration Techniques
Engineering Department

Strength of Materials

Second Stage

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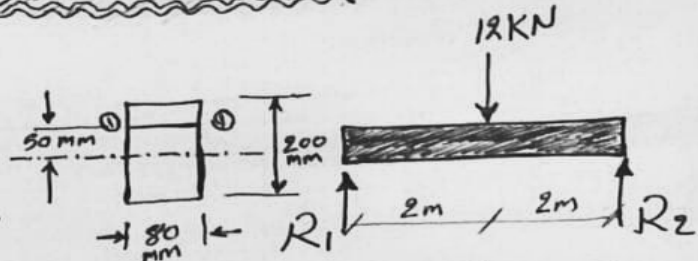

م.س. مرقضي ماسودي

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.

$$R_1 = R_2 = \frac{12}{2} = 6 \text{ kN}$$

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

τ_{max} at the N.A

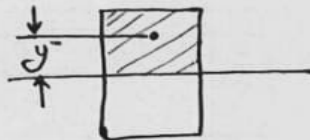
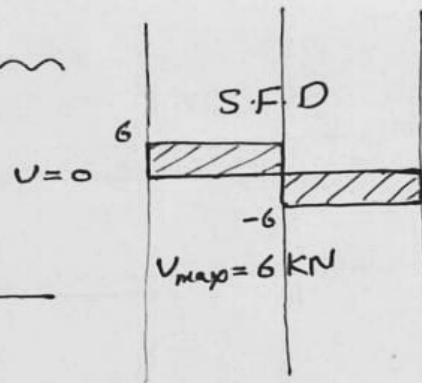
$$V = 6 \text{ kN}$$

$$b = 0.08 \text{ m}$$

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

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

$$= \left[0.08 \cdot \frac{0.2}{2} \right] \cdot \left(\frac{1}{2} \cdot \frac{0.2}{2} \right) \Rightarrow \tau_{\text{max}} =$$



$\textcircled{2}$

$$V = 6 \text{ kN} ; b = 0.08$$

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

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

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

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

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

