

* CURVED BEAMS *Imp

- V1.* What is Curved Beam?
- QUM
QBM V2.* Differences between Curved Beam and Straight beam?
- V3.* Stresses in Curved Beam.
- QBM V4.* What are the assumptions made in finding stress distribution for a curved flexural member.
- V5.* Stress in Closed Ring.



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V

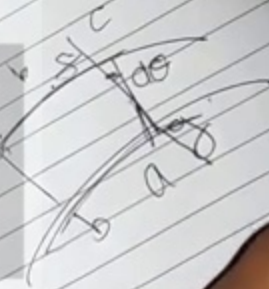


Vizle MECH TIME

cycle



Mb



ie Mb

vizle

et Mb



$$M_b = - \int y dF$$

Substitute the value of dF

$$M_b = \frac{E d \theta}{\theta} \int y^2 dA$$

$$= \frac{E d \theta}{\theta} \int (y^2)$$

$$= \frac{E d \theta}{\theta} \int y dF$$

Geometrical Moment of Area $\int y^2 dA$

represent I

$$M_b = \frac{E d \theta}{\theta} I$$

(iii)

$$M_b = -\sigma (y + r_n) \cdot A \cdot y$$

$$\therefore \sigma = -\frac{M_b y}{(y + r_n) A e} \quad \text{--- (iv)}$$

\therefore Bending stress at the Outer fibre $\sigma_{bo} = -\frac{M_b c_o}{A e (r_n + c_o)}$
 $\sigma_{bo} = -\frac{M_b c_o}{A e r_o} \quad \text{--- (v)}$ ($\because r_n + c_o = r_o$)

\therefore Bending stress at the Inner fibre.

$$\sigma_{bi} = \frac{M_b c_i}{A e (r_n - c_i)} \quad \text{--- (vi)}$$

$\sigma_{bi} = \frac{M_b c_i}{A e r_i}$ ($\because r_n - c_i = r_i$)





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