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Strength Of Material
By-Krishna Sir

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STRENGTH OF MATERIAL

OR

MECHANICS OF MATERIAL

OR

MECHANICS OF SOLIDS

OR

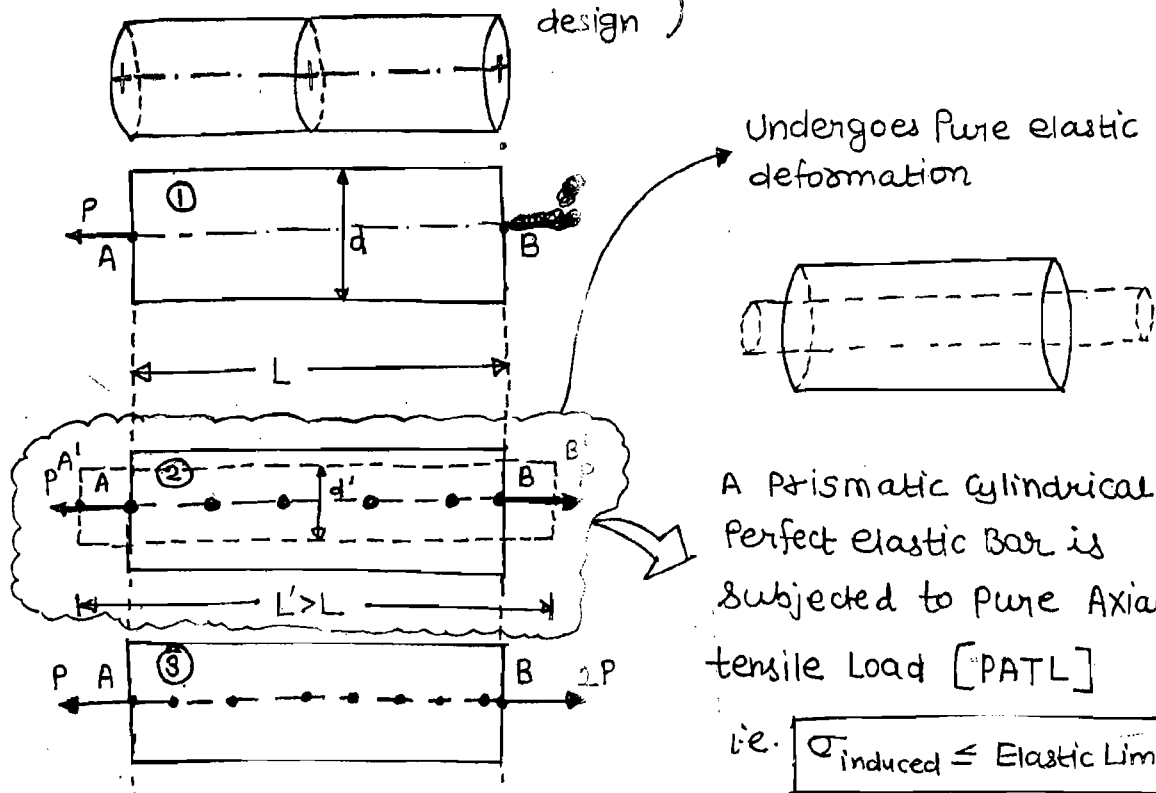
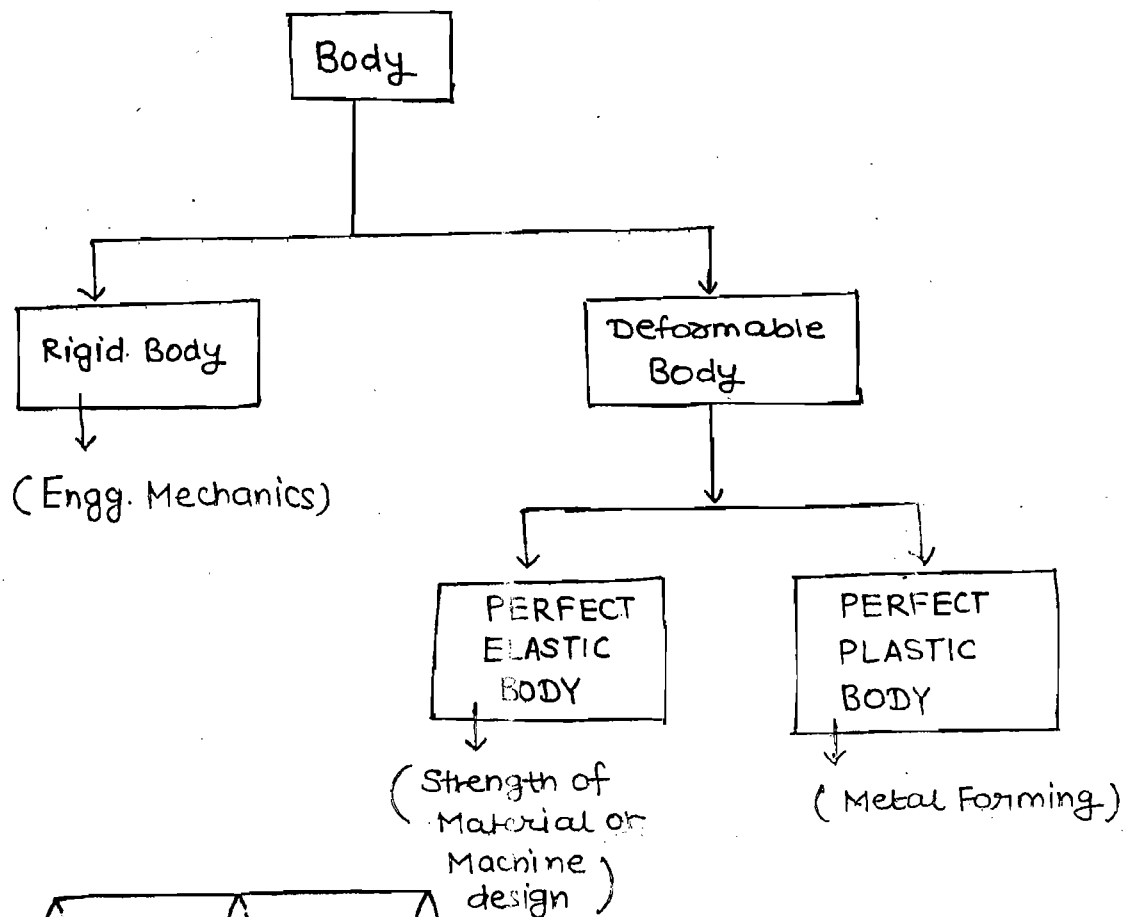
MECHANICS OF STRUCTURE

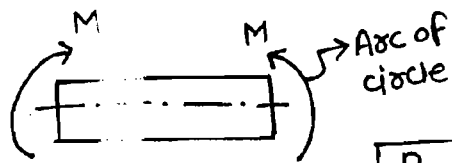
OR

MECHANICS OF PERFECT ELASTIC BODIES



- $\sigma_{\text{induced}} \leq \text{Elastic Limit} \Rightarrow \text{Perfect elastic Body}$
- $\sigma_{\text{induced}} > \text{Yield strength} \Rightarrow \text{Perfect Plastic Body}$





Pure Bending
 → i.e.

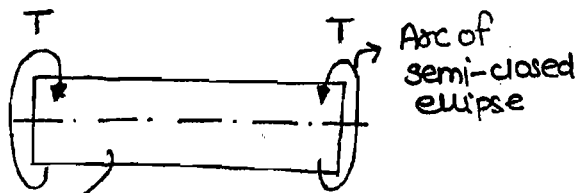
$$\text{Axial load} = \text{Shear Force} = \text{Twisting Moment} = \text{ZERO}$$

$$\text{Bending moment} = \text{Constant}$$

$$\text{i.e. Shear Force} = \text{Bending moment} = \text{Twisting moment} = 0$$

$$\text{Axial load} = \text{Constant}$$

Bending → Two equal parallel opposite eccentric axial load



Pure Torsion

Torsional Couple → Two equal and opposite parallel eccentric transverse shear load.

$$\text{Axial load} = \text{Shear force} = \text{Bending} = \text{zero}$$

$$\text{Torsional Moment} = \text{Constant}$$

Pure axial Load

$$\sigma_a = \frac{P}{A} ; \delta_L = \frac{PL}{AE}$$

$$SV = \frac{PL}{E} (1 - 2\mu)$$

$$FOS = \frac{\text{Failure stress}}{\text{Per Stress}}$$