

O anand_mani16

https://www.anandmani.com/

APPLICATIONS OF ELASTIC BEHAVIOUR OF SOLIDS

when weight is suspended in beam. it Strouse buckling

> $\omega\ell$ $4 bd^{3}v$



• Extension is measured in ropes of Cranes while load is suspended `on it

$$\sigma = \frac{mg}{A}$$

 σ = stress produced in rope



I - SHAPED BEAMS

- I Shape of beams makes them excellent for unidirectional bending.
- Use of rectangular shaped beams is not possible in railway tracks as of improper load distribution

ISOTHERMAL BULK MODULUS B = P

ADIABATIC BULK MODULUS

(I) B = YP. (2) Y = Adiabatic constant

POISSON'S RATIO

Ratio of lateral to longitudinal Strain is Poisson's ratio

 $\sigma = \frac{-\Sigma \text{ lateral}}{\Sigma \text{ longitudnal}} \left(-1 \le \sigma \le 0.5\right)$

Relation between Y. B. η and Σ (1) Y = 3B (1 - 2σ). (2) $Y = 2N(1 + \sigma)$ (3) $\sigma = \frac{3B - 2n}{2n + 6B}$

TYPES OF ELASTIC CONSTANTS

YOUNG'S MODULES = $\frac{\sigma}{\sigma}$

Property of material, that tells how easily it can be stretched.

 σ . E are normal stress and strains respectively

SHEAR MODULUS

· Ratio of Shear Stress by Shear Strain. · Unit is pascal (Pa)

 $-\Delta P$ BULK MODULUS = $\Delta V / V$

measure of ability of material to withstands the change in volume. Negative Sign indicates decrease in volume

COMPRESSIBILITY = $\frac{1}{R}$

· Reciprocal of Bulk modulus Value depends on particle shape. density and chemical composition.



