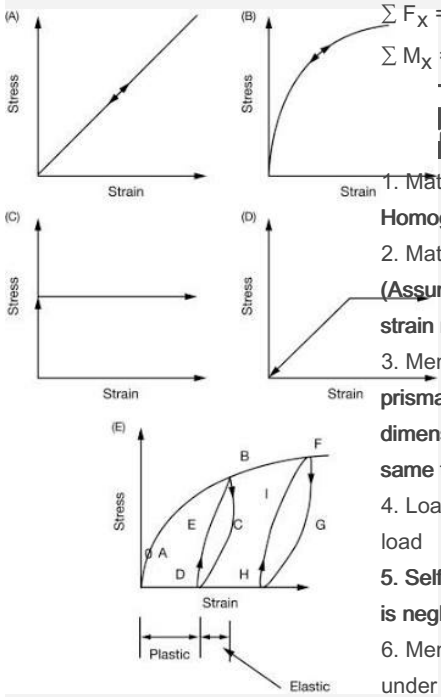
Strain - Stress Graph



Slope of the curve is Young's Modulus

Young's Modulus (E) = $\Delta\sigma / \Delta\varepsilon$

Perfectly Elastic Bodies retain their shape in elastic region

Rigid vs Plastic Bodies

Perfect Rigid body an ideal physical model of a solid object that does not deform, bend, stretch, or change shape in any way when forces or torques are applied to it	Perfectly Plastic Body does not regain its original shape or size at all when an external deforming force is removed, remaining permanently deformed

Static Equilibrium Equation

$\sum F_x = 0$; $\sum F_y = 0$; $\sum F_z = 0$;

$\sum M_x = 0$; $\sum M_y = 0$; $\sum M_z = 0$;

nptions in SOM

1. Material is said to be **Homogeneous & Isotropic**
2. Material obeys **Hooke's Law (Assume to be within stress & strain region)**
3. Member is assumed to be **prismatic (Cross section & dimensions are assumed to be same through the length)**
4. Load is assumed to be static load
5. **Self weight of the component is neglected**
6. Member is assumed to be under static equation

Homogeneous : A material is said to be homogeneous when it exhibits same elastic properties at any point in a given direction

Isotropic:A material is said to be isotropic when it exhibits same elastic properties in any direction.

Every Homogeneous material need not be isotropic & vice versa

Anisotropic : A material is said to be anisotropic when it exhibits direction dependent elastic properties

Classification of Loads - Application

With Respect to Time :

1. **Static Load** - Dead Load & Gradually Applied Load
2. **Dynamic Load** - Impact / Shock / Suddenly Applied Load

With Respect to Cross Section :

1. **Normal Load** - Axial Loads & Eccentric Axial Load
2. **Shear Load** - Transverse Shear load & Eccentric transverse load

With Respect to distribution load :

1. **Distributed Load**
- Uniformly Distributed Load
- Uniformly varying Load
- Uniformly Distributed Moment

2. **Concentrated Load**
- Concentrated Point Load
- Concentrated Moments

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