Tension :

Tension is defined as the pulling force exerted by each end of a string, cable, chain or similar one-dimensional continuous object or by each end of a rod, truss member or similar three dimensional object.

Compression :

Compression is the reduction of the volume of a gas, liquid or a solid due to external forces acting upon it. The compression itself is not a well-defined quantity. It can be taken as the amount of volume reduced or the percentage of the amount of volume reduced.

Shear stress :

Shear stress is a stress state where the stress is parallel to the surface of the material, as opposed to normal stress when the stress is vertical to the surface . Shear stress may occur in solids or liquids; in the latter it is related to fluid viscosity.

1.2.1.Compressive stress

Compressive stress

The stress induced at any cross section of the member which is subjected to a compressive force is known as compressive stress.

Compressive stress $= \dfrac{\text{Compressive Force}}{\text{Area of cross section}}$

1.2.2.Tensile stress

Tensile stress

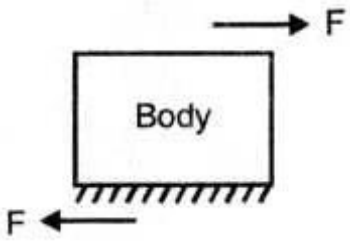
The stress induced at any cross section of the member which is subjected to a tensile force is known as tensile stress.

$$\text{Tensile stress} = \frac{\text{Tensile Force}}{\text{Area of cross section}}$$

1.2.3. Shear stress in a body

Shear stress

The stress induced in a body when subjected to two equal and opposite forces which are acting tangentially across the resisting section is known as shear stress.



The body tends to shear off across the section due to the tangential force F.

1.3 Deformation of simple and compound bars

1.3.1 Compound bar

Compound bar

A bar which is made up of a number of bodies of different length and cross section and of different material is known as compound bar.

1.3.2 Concept used for finding stresses in a composite bar

Let us discuss about the concept used for finding stresses in composite bar

Composite bar: A bar made up of two (or) more members of different materials and sections rigidly fixed with each other and behaving as one unit when subjected to axial force is known as composite bar. The stresses in composite bar are determined as follows:

1.The extension (or) compression in each bar is equal i.e., $\delta_{11} = \delta_{l2.}$

2.The total external force applied on the composite bar is equal to the sum of the loads carried by each different material.

i. e., $P = P_1 + P_2$

$= (\sigma_1 A_1) + (\sigma_2 A_2)$

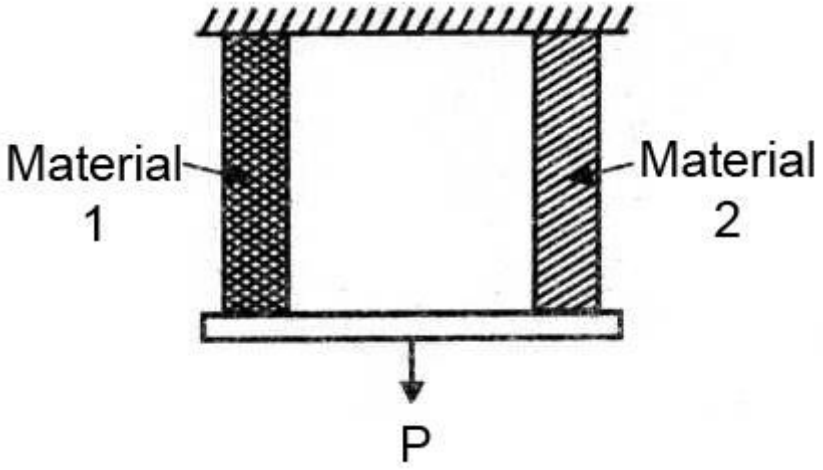


figure:.Composite bar