

DI Physics flows

Paper-I

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Relations between the elastic constants

एचएन कट-आफ़ स्विच
सुविधाजनक और ख्याल रखें

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One Month

(*) Beam: A rod (or bar) of uniform rectangular or circular cross-section whose length is very large in comparison to its thickness or radius is called a beam.

A beam may be considered as made up of a number of thin plane (or cylindrical) layers, collected parallel (or coaxial) to each other. Also, each layer is regarded as to consist of a number of parallel longitudinal fibres, which are called the longitudinal filaments.

(*) Neutral Surface: When a beam is clamped horizontally at one end and loaded at the other, it undergoes bending. The filaments (or fibres) of outward side are lengthened and subjected to tension, while those of the inner side are shortened and compressed. In between these two portions, there is a layer or surface in which the filaments are neither elongated nor shortened.

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Such a surface is called neutral surface.
In the fig. (1); EFGH is the neutral surface.

(*) Plane of Bending: As shown in fig (1), the plane has symmetry ABCD parallel to its length. This plane intersects every transverse section in a straight line which is an axis of symmetry for that section.

If the bending is uniform, all longitudinal filaments are bent into circular arcs in planes parallel to the plane of symmetry ABCD. Then, plane ABCD may be called the plane of bending.

The centres of curvature of the longitudinal filaments lie on a straight line perpendicular to the plane of bending.

In fig. (1), line OO' is the axis of bending.

(*) Neutral axis: The line of intersection of the plane of bending with the neutral surface (both are perpendicular to each other) is called the neutral axis. In fig. (1), line NN' is the neutral axis.

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Old Model

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