

Beam:

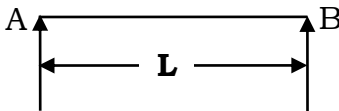
“It is a structural member the length of which is considerably more than the other two dimensions (width and depth) and is only transversely (vertically) loaded.”

Types of Beam:-

1. Simply supported beam
2. Cantilever beam
3. Overhanging beam
4. Fixed beam
5. Continuous beam

1. Simply Supported Beam

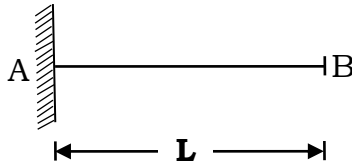
“A beam which is freely supported on the walls or columns at its both the ends is known as simply supported beam”.



Simply Supported Beam

2. Cantilever Beam

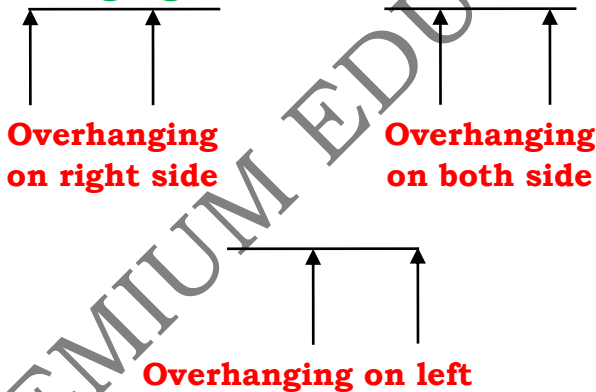
“A beam fixed at one end and free at other is called as a cantilever beam.”



3. Overhanging Beam

If the end portion of the beam extends beyond the support, is known as overhanging beam.

A beam may be **overhanging on one side** or **both sides**.



4. Fixed Beam

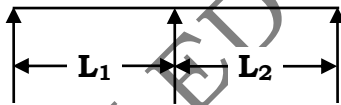
“A beam whose both the ends are rigidly fixed in walls is called a fixed beam, constrained beam, built in beam or an encastre beam.”



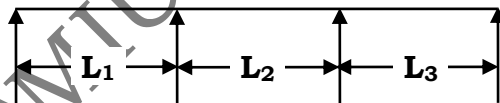
Figure Fixed Beam

5. Continuous Beam

“A beam which is supported on more than two supports (at least three support) is known as continuous beam.”

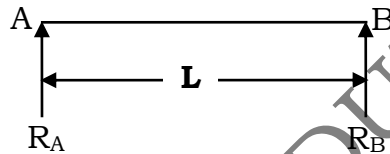
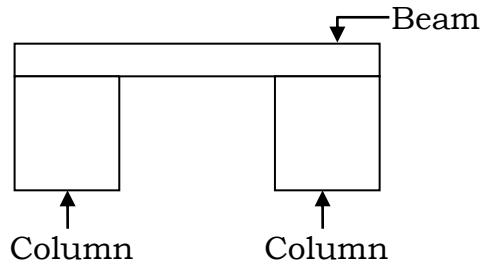


Two span continuous beam



Three span continuous

Beam Reactions



Simply Supported Beam

R_A – Reaction at point A

R_B – Reaction at point B

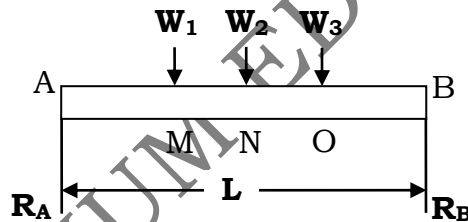
R_A & R_B are called as **beam reactions**

Types of Load:

1. Concentrated or point load
2. Inclined point load
3. Uniformly distributed load (UDL)
4. Equivalent point load

1. Concentrated or point load

“A load acting at a point on the beam is known as concentrated or point load.”

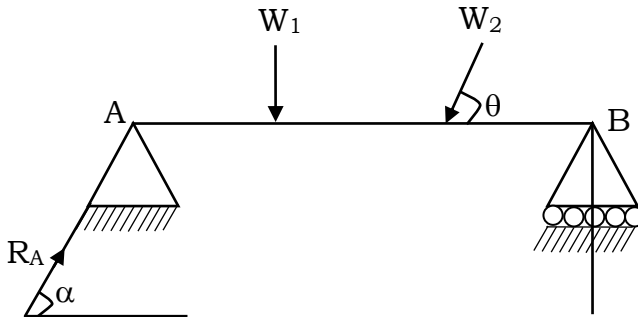


W_1 – Point load acting at M

W_2 } -Point load acting at N & O
 W_3 }

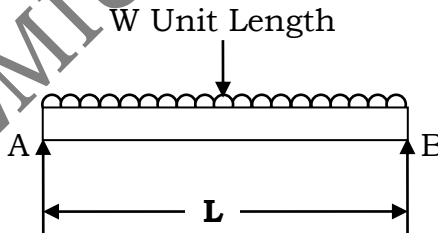
1. Inclined point load

“A load acting at an angle θ to the axis of the beam is known as inclined point load.”



2. Uniformly distributed load (UDL)

“A load which is spread up uniformly on the beam is known as uniformly distributed load” (UDL). Intensity of udl $W/\text{unit length}$ is called as intensity of u.d.l.



All the conditions of equilibrium

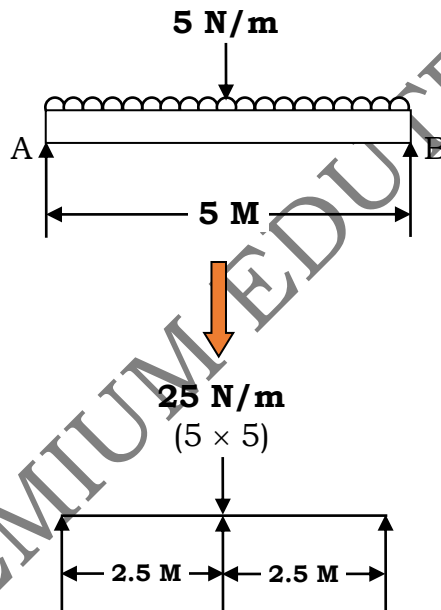
$$\Sigma F_H = 0,$$

$$\Sigma F_V = 0,$$

$$\Sigma F_M = 0,$$

3. Equivalent point load

“Uniformly point load is converted into equivalent point load.” It is act at the centre of gravity of the load.



PREMIUM EDUTECH