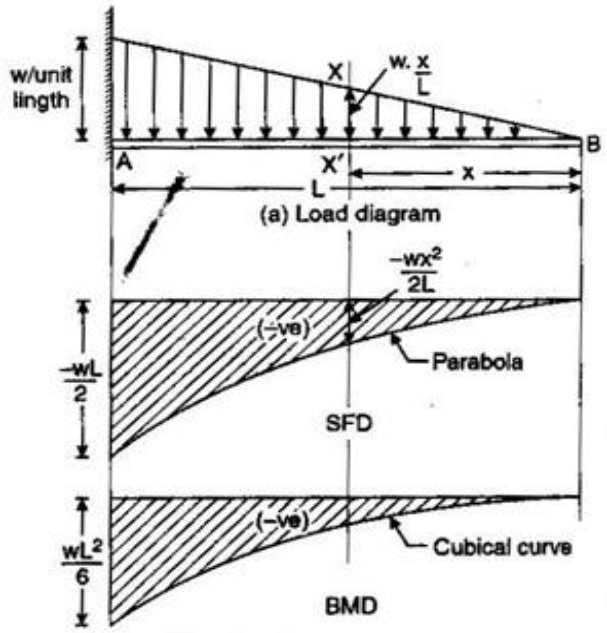
AR6301 : Mechanics of Structures II

Unit 1 : Shear Force and Bending Moment

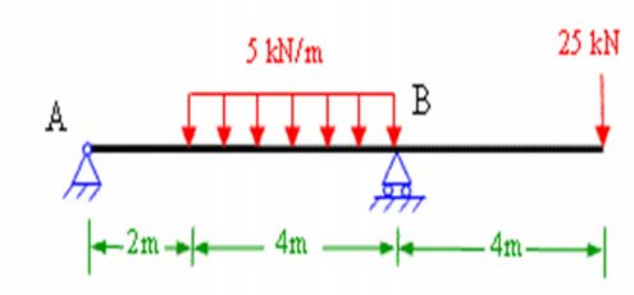
Lecture 5: Simply supported and Overhanging beams

FAQs

Draw the shear force and bending moment diagrams for simply supported beam subjected to uniformly varying load?



Find the shear force and bending moment for overhanging beam given below?



Taking moment about support A ($\Sigma M_A=O$), we get R_A=-10kN and R_B=55kN.

Shear force calculations:

At A, F_A(left)=0

F_A(right)=-10kN

At C, F_C=-10kN

At B, F_B(left)=-10-5x4=-30kN

F_B(right)= -10-5x4+55=25kN

At D,F_D(left)=25kN

F_D(right)=25-25=0

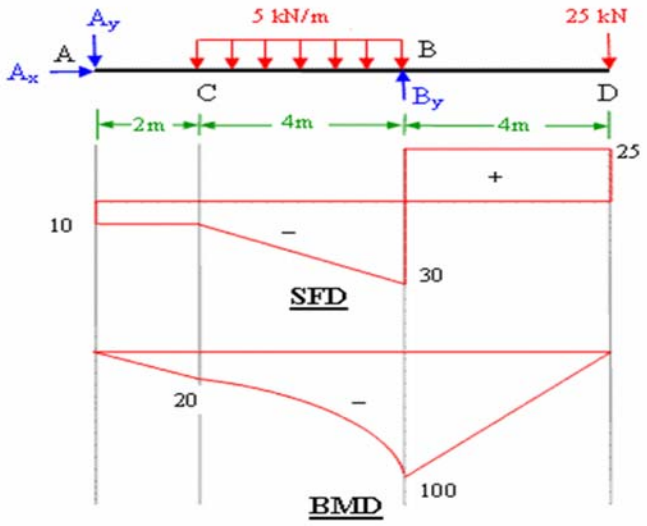
Bending moment calculations:

M_A=0

M_C= -10x2=-20kNm

M_B=-10x6-5x4x2=-100kNm

M_D=0



What are the types of uniformly varying load?

It is that load whose magnitude varies along the loading length with a constant rate. The total load can be obtained by calculating the total area of triangle & multiplied if by the intensity or rate of loading. The total load will act through the centroid of the triangle.

Uniformly varying load is further divided into two types;

1. Triangular Load
2. Trapezoidal Load

Triangular load is that whose magnitude is zero at one end of span and increases constantly till the 2nd end of the span.

Trapezoidal load is that which is acting on the span length in the form of trapezoid. Trapezoid is generally form with

the combination of uniformly distributed load (UDL) and triangular load.