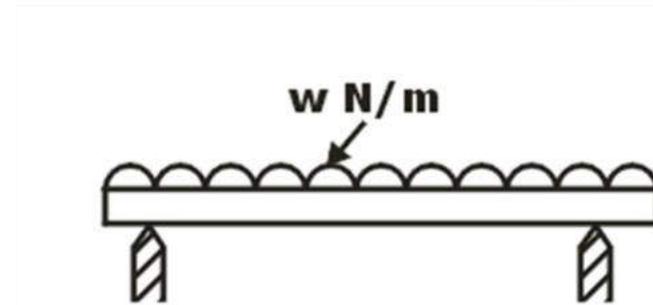


Uniformly Distributed Load

A uniformly distributed load is a type of load which acts in constant intensity throughout the span of a structural member. A uniformly distributed load is spread over a beam so that the rate of loading w is uniform along the length (i.e., each unit length is loaded at the same rate). The rate of loading is expressed as w N/m run. Various questions are formulated in the [GATE CE question paper](#) based on this topic.

In Civil Engineering and construction works, uniformly distributed loads are preferred more than point loads because point loads can induce stress concentration. In the case of prestressed concrete, if the beam supports a uniformly distributed load, the tendon follows a parabolic profile to balance the effect of external load.



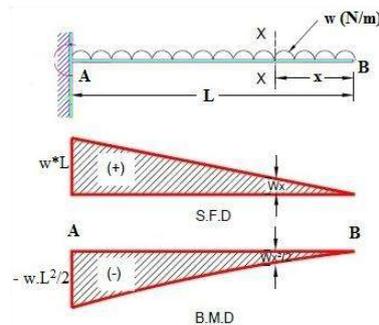
Uniformly Distributed Load Formula

Many parameters are considered for the design of structures that depend on the type of loads and support conditions. These parameters include bending moment, shear force etc. In most real-world applications, uniformly distributed loads act over the structural member. It includes the dead weight of a structure, wind force, pressure force etc. UDL is essential for the [GATE CE exam](#). These loads are expressed in terms of the per unit length of the member. Various formulas for the uniformly distributed load are calculated in terms of its length along the span.

The formula for any stress functions also depends upon the type of support and members. For Example, the maximum bending moment for a simply supported beam and cantilever beam having a uniformly distributed load will differ. The effects of uniformly distributed loads for a symmetric beam will also be different from an asymmetric beam.

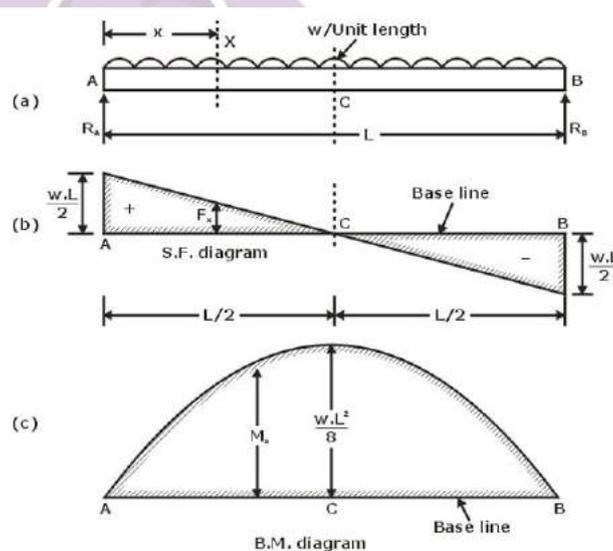
Cantilever Carrying a Uniformly Distributed Load

A cantilever beam is a type of beam which has fixed support at one end, and another end is free. A cantilever beam is a determinate beam mostly used to resist the hogging type bending moment. A cantilever beam has a maximum bending moment at its fixed support when subjected to a uniformly distributed load and significant for the [GATE exam](#). The shear force and bending moment diagram for the cantilever beam having a uniformly distributed load can be described as follows:



Shear Force and Bending Moment of Simply Supported Beam With Uniformly Distributed Load

Shear force and bending moment for a beam are an important parameters for its design. A beam AB of length L is simply supported at the ends A and B, carrying a uniformly distributed load of w per unit length over the entire length. The reactions at the supports will be equal, and their magnitude will be half the total load on the entire length. [GATE CE syllabus](#) carries various topics based on this. Shear force and bending moment for a simply supported beam can be described as follows.



The shear force equation for a beam has one more degree function as that of load and bending moment equation have two more degree functions. So in the case of a Uniformly distributed load, the shear force will be one degree or linear function, and

the bending moment will have second degree or parabolic function. So, the slope of the shear force diagram for uniformly distributed load is constant throughout the span of a beam.

Uniformly Distributed Load Example

As most structures in civil engineering have distributed loads, it is very important to thoroughly understand the uniformly distributed load. The concept of the load type will be clearer by solving a few questions. Here such an example is described for a beam carrying a uniformly distributed load.

