SNS COLLEGE OF TECHNOLOGY

19MCB204 – SOLIDMECHANICS

UNIT- IV DEFLECTION OF BEAMS AND BUCKLING OF COLUMNS

Columns - End conditions

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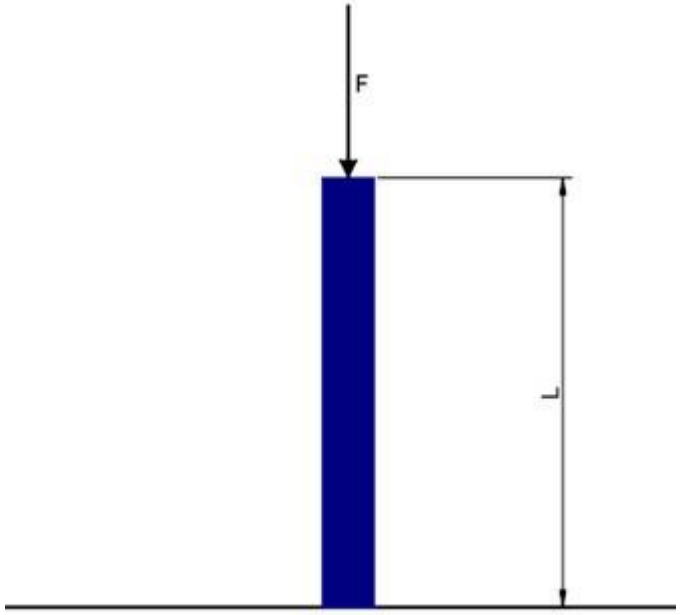
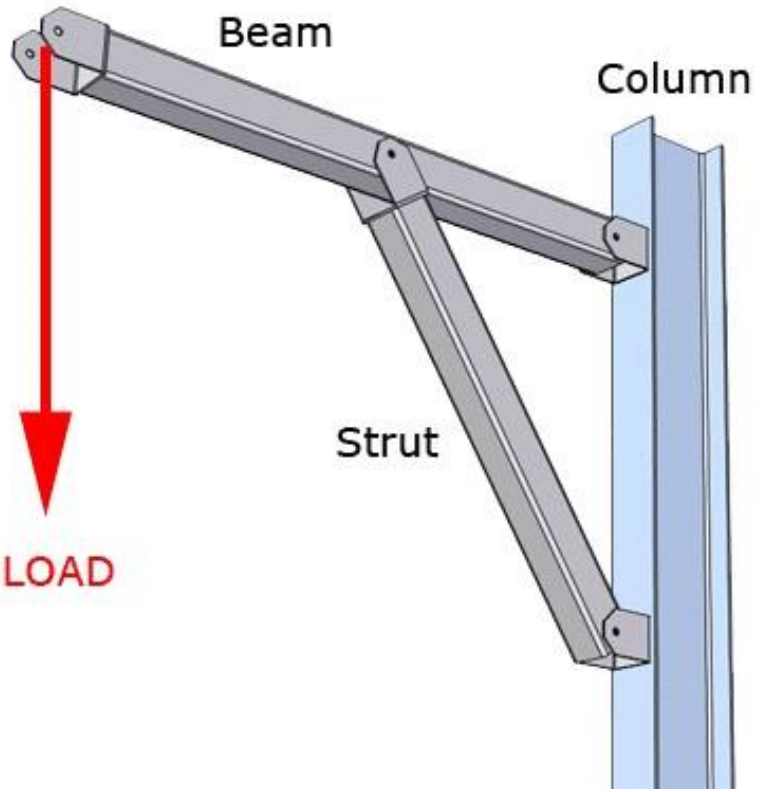
COLUMNS

Structural speaking a column is the vertical member of a broader construction that has the function of transferring the load it supports downwards or as a load transfer structure, in the same direction.



STRUT

A strut can be thought of as a long, inclined column. Column is a thick compression member within a structure, and it fails due to compression rather than buckling.



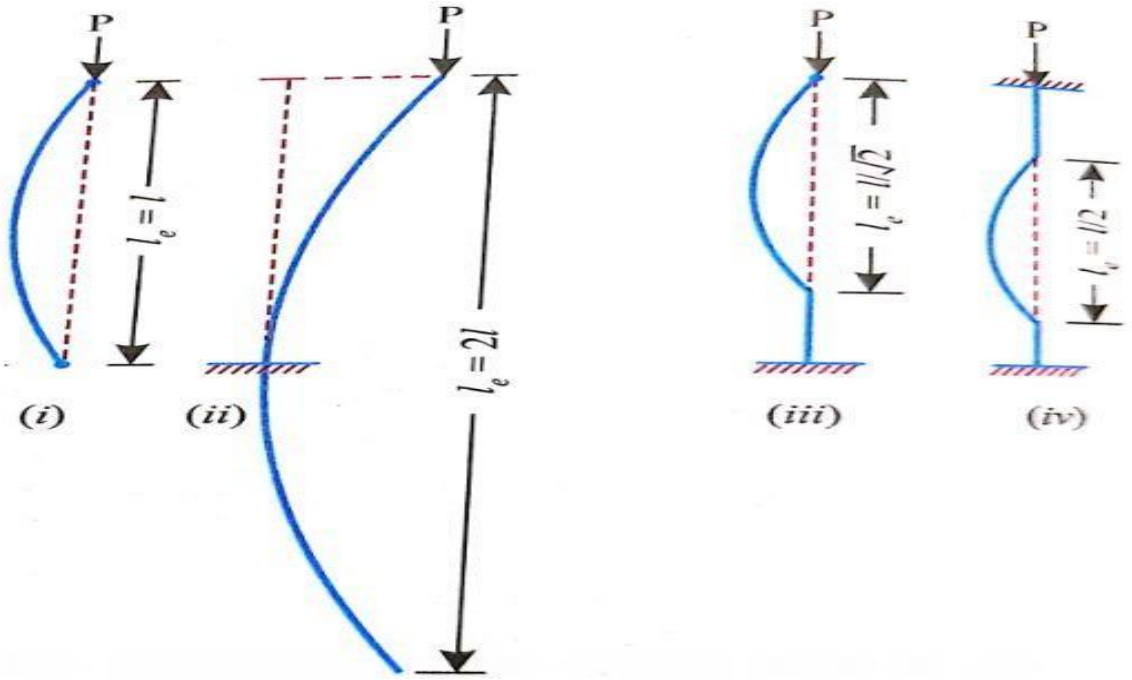
Equivalent length (l_e)

i) Both ends pin joined (or) hinged (or) rounded (or) free

ii) One end fixed and other end free.

iii) One end fixed and the other pin jointed

iv) Both ends fixed.



End conditions

i) **Both ends hinged**

Equivalent length = Actual length.

$l_e = l$

ii) **One end fixed and Other end free.**

$l_e = 2l$, the free end will sway sideways. and the curvature in the length l will be similar to that of the upper half of the simple Column.

iii) **One end fixed and Other pin jointed.**

$l_e = \frac{l}{\sqrt{2}}$, between the top of the Column. and inflexion point.

iv) **Both ends fixed.**

$l_e = \frac{l}{2}$, the distance between the two inflexion Points