



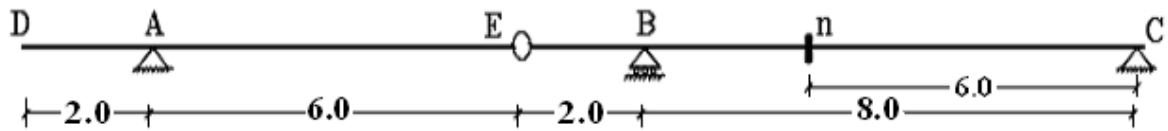
HIGHER TECHNOLOGICAL INSTITUTE

Department of Civil Engineering

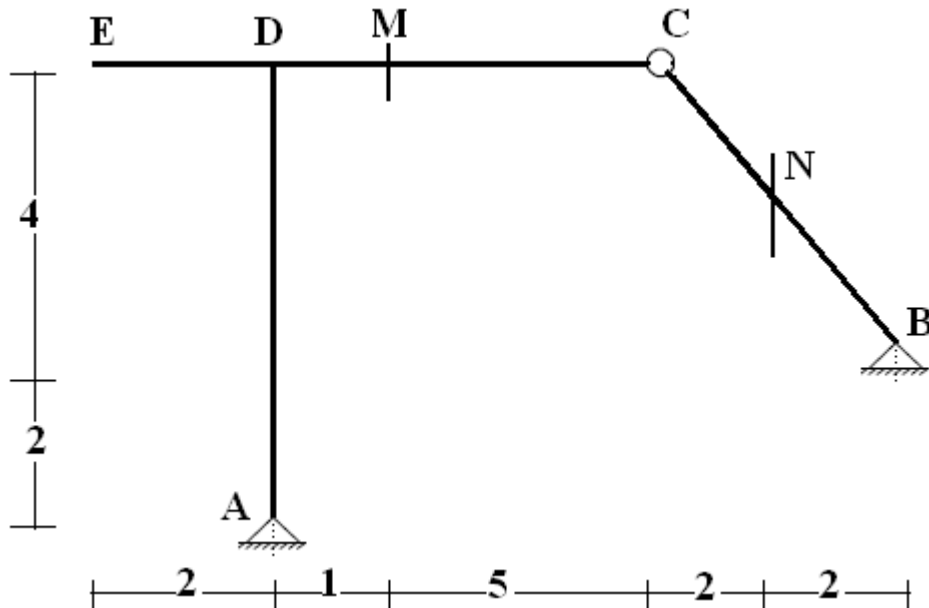
Revision of [CT211 - Theory of Structures (3)]

Influence Lines

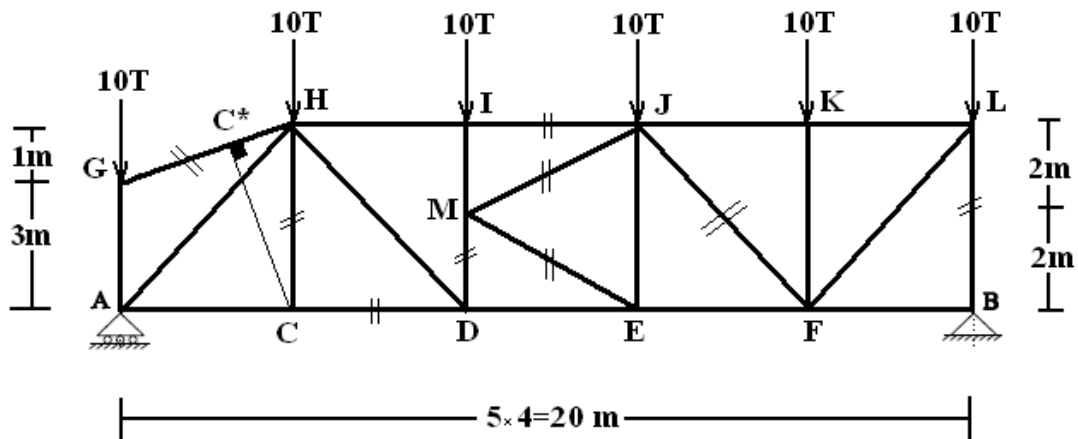
- (1) Draw the influence lines for: Y_A , Y_E , M_A , $Q_{A\text{-left}}$, Y_B , Y_C , Q_n , M_n , $Q_{B\text{-left}}$, and M_B . Also, calculate the maximum and minimum values for M_n for D.L.=2 t/m and L.L = 3 t/m.



- (2) Draw the influence lines for: normal, shear, and bending at sections M and N. Also find the influence lines of $Q_{D\text{-left}}$, M_{DE} , M_{DA} , M_{DC} , $Q_{D\text{-right}}$, N_{DA} , and Q_{DA} .

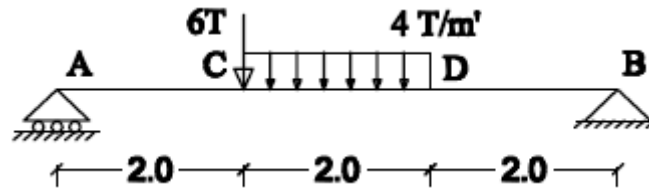


(3) Find the influence lines for the marked members.

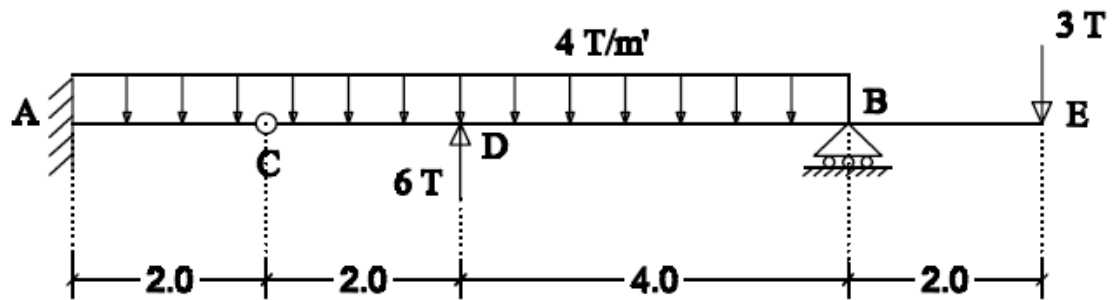


Deflection

(4) Draw the elastic lines for the shown beams.

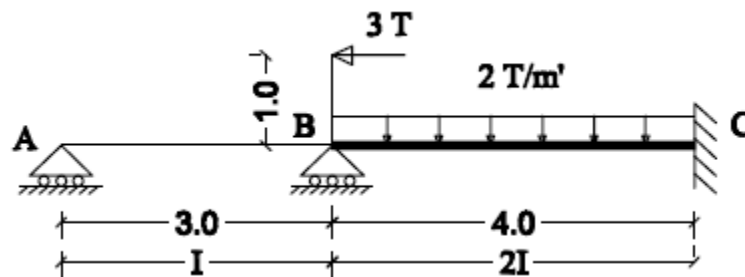


(5)

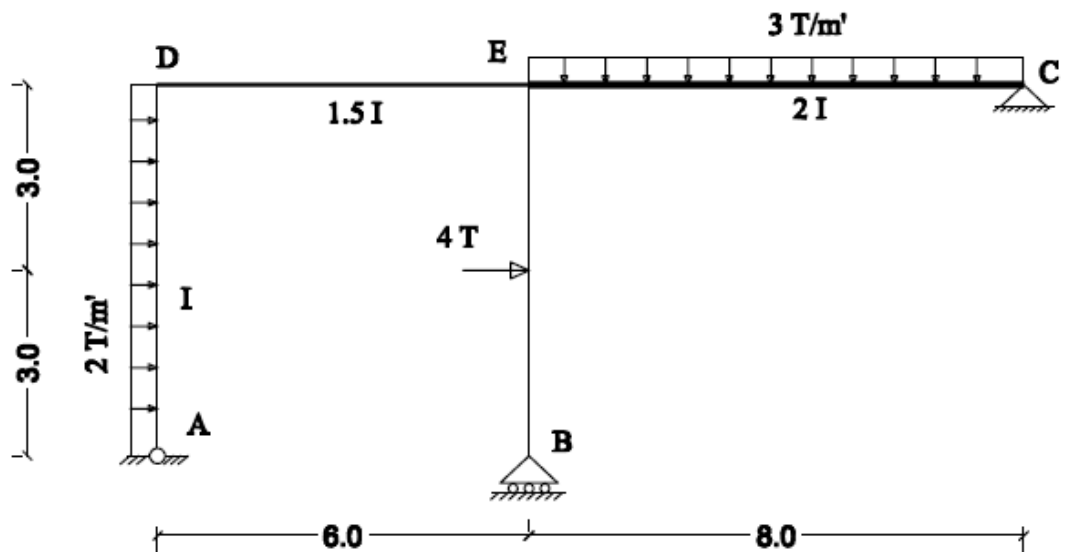


Three Moment Equation Method

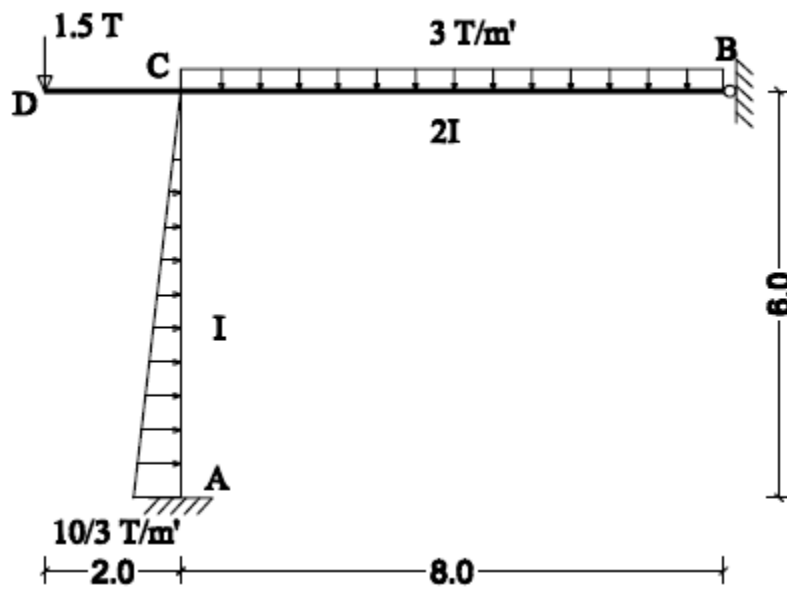
(6) Draw S.F.D and B.M.D for the shown beam.



(7) Draw B.M.D for the shown frames.

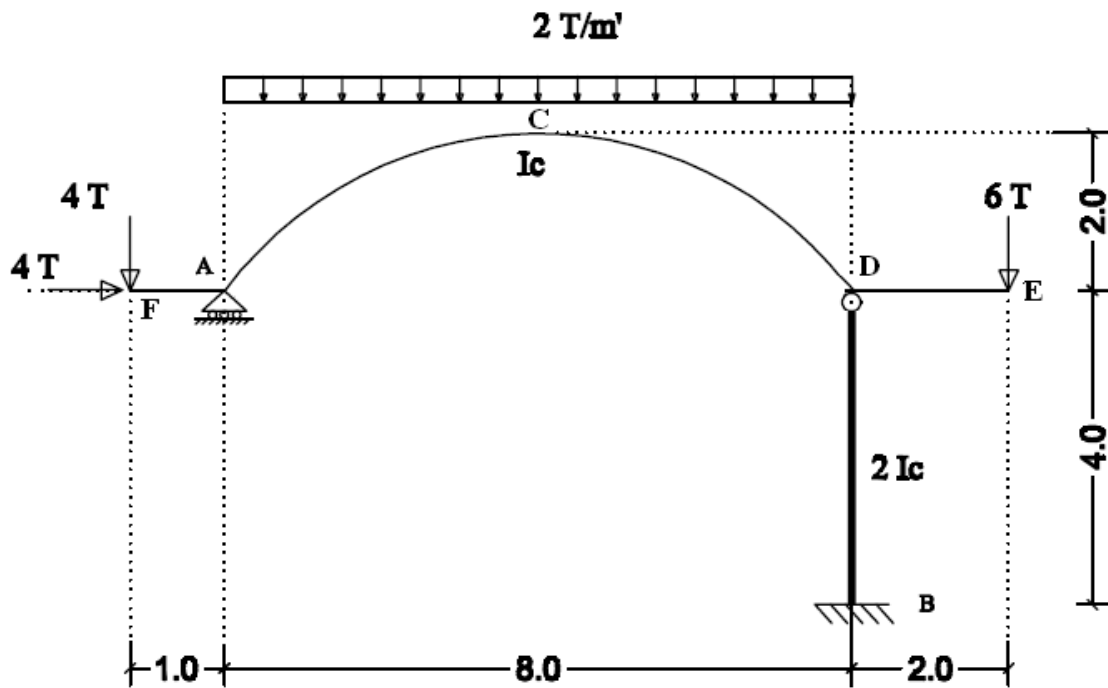


(8)

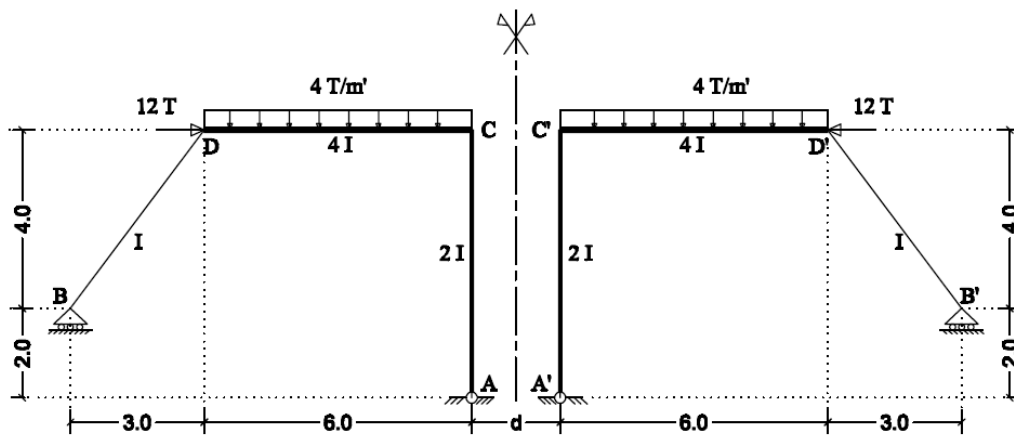


Virtual Work Method

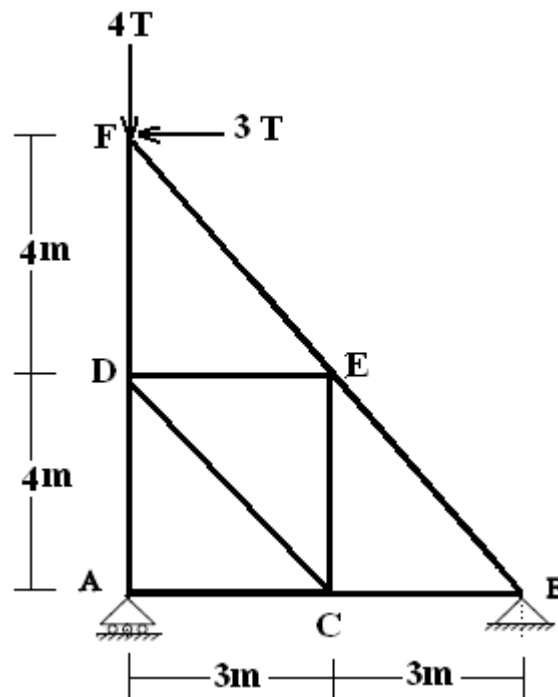
(9) Find H_A , Y_c and Φ_B for the shown structure ($EI=10000 \text{ t.m}^2$ and $EA = 40000 \text{ t}$).



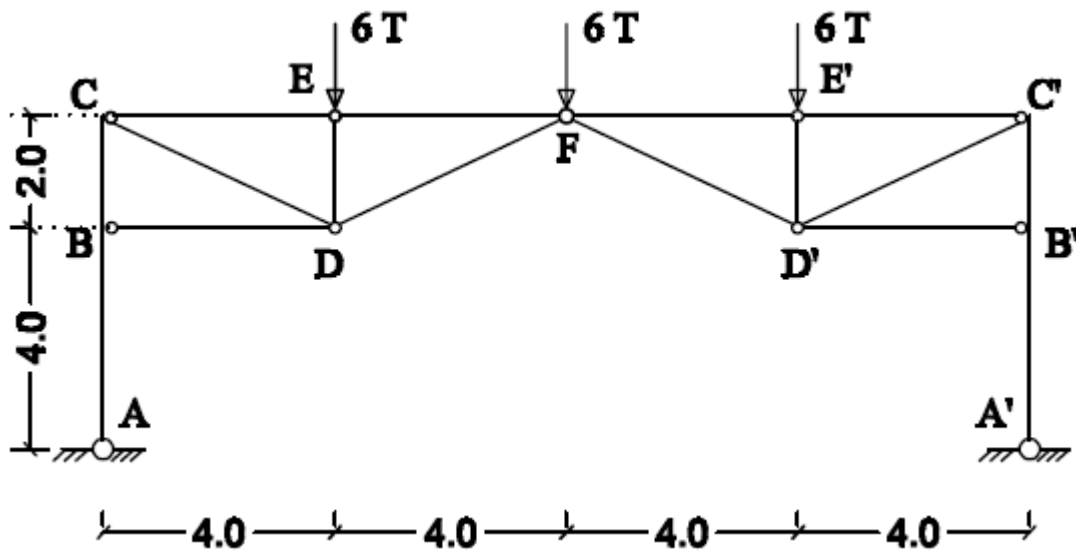
(10) Find the maximum distance between the two frames that points C and C' will not touch ($EI=10000 \text{ t.m}^2$ and $EA = 40000 \text{ t}$).



(11) Find Y_F and the relative displacement between A and E - ($EA = 40000 t$).



(12) Find Y_F for the shown trussed frame ($EI=10000 t.m^2$ and $EA = 40000 t$).



Good Luck

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