



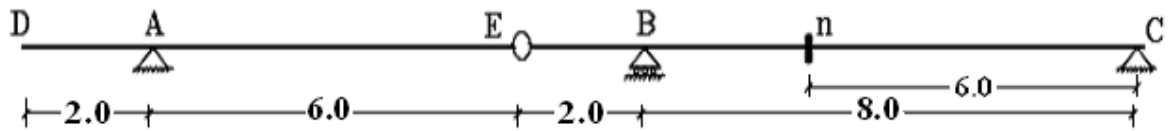
## HIGHER TECHNOLOGICAL INSTITUTE

### Department of Civil Engineering

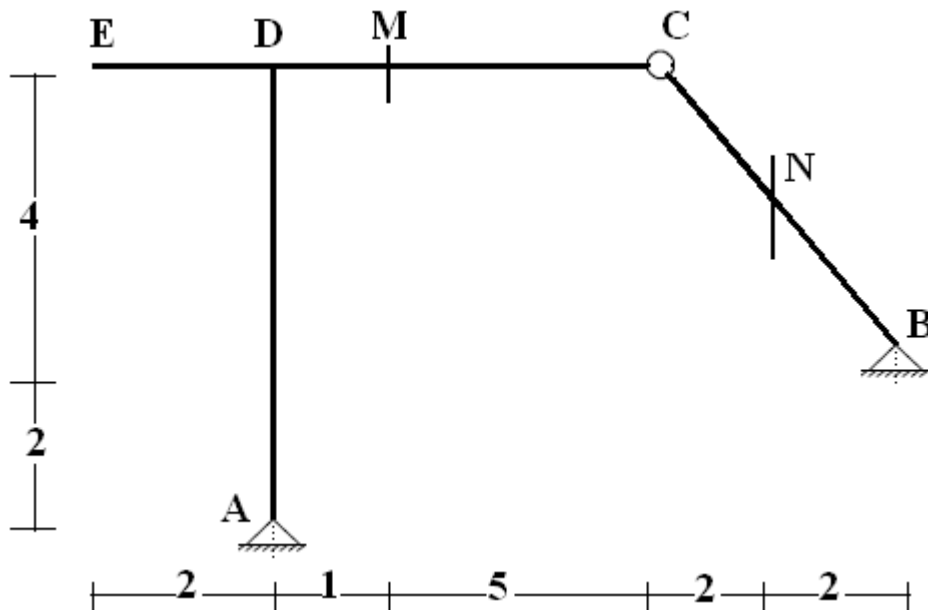
### Revision of [CT211 - Theory of Structures (3)]

#### Influence Lines

(1) Draw the influence lines for:  $Y_A$ ,  $Y_E$ ,  $M_A$ ,  $Q_{A-left}$ ,  $Y_B$ ,  $Y_C$ ,  $Q_n$ ,  $M_n$ ,  $Q_{B-left}$ , 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.

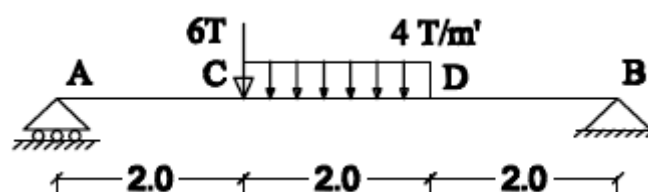


(2) Draw the influence lines for: normal, shear, and bending at sections M and N. Also find the influence lines of  $Q_{D-left}$ ,  $M_{DE}$ ,  $M_{DA}$ ,  $M_{DC}$ ,  $Q_{D-right}$ ,  $N_{DA}$ , and  $Q_{DA}$ .

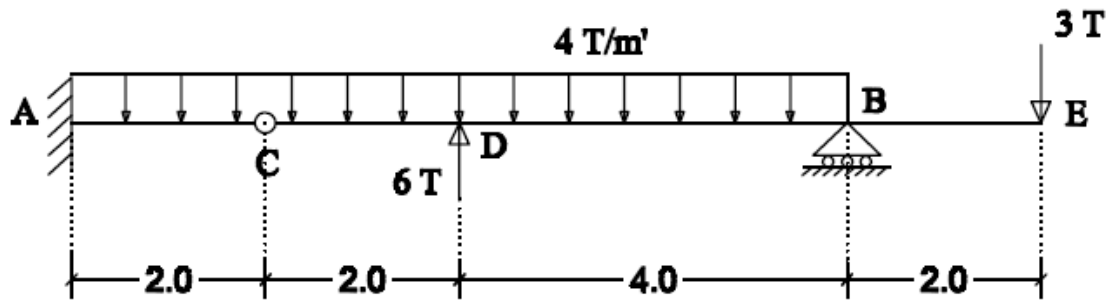


#### Deflection

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

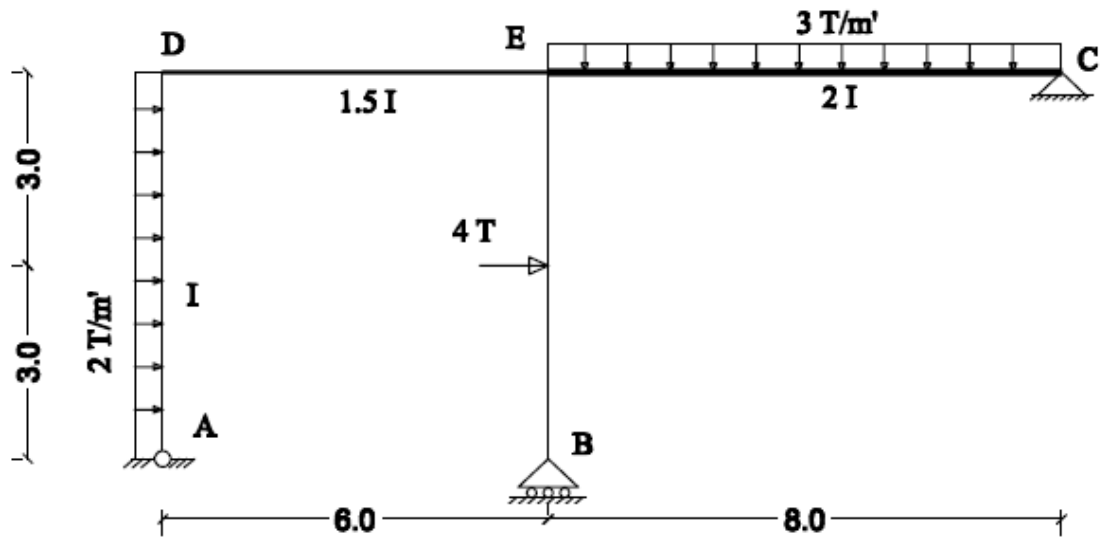


(4)

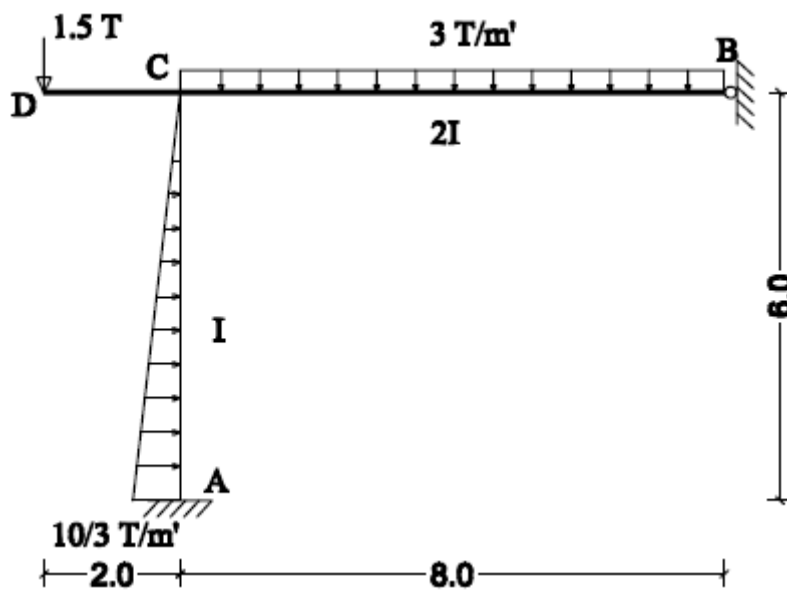


### Three Moment Equation Method

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

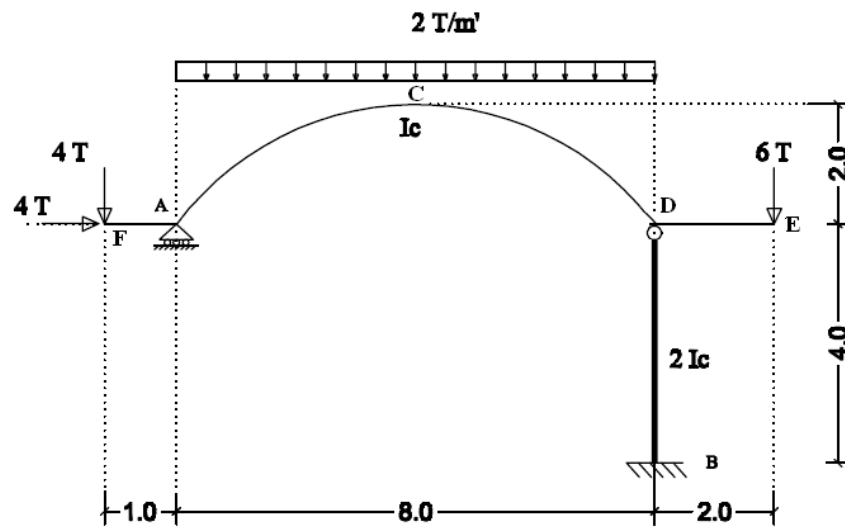


(6)

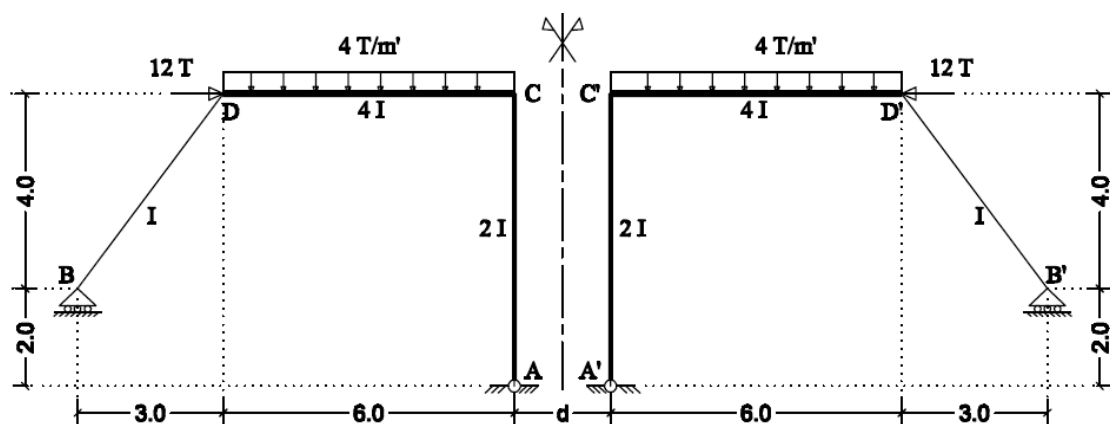


## Virtual Work Method

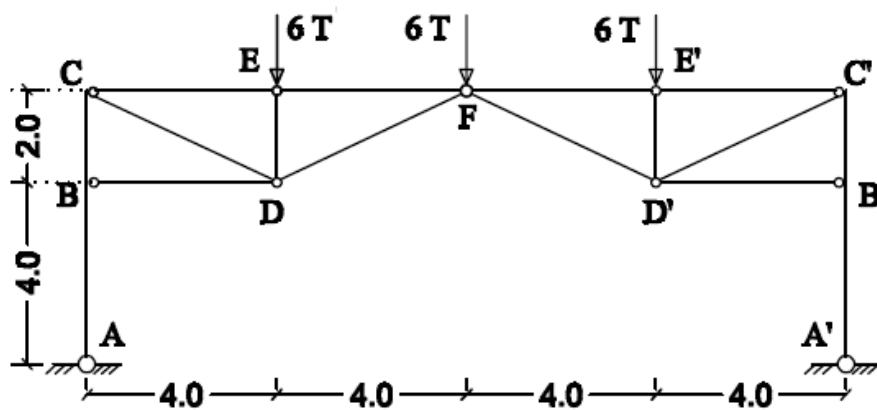
(7) Find  $H_A$ ,  $Y_c$  and  $\Phi_B$  for the shown structure ( $EI=10000 \text{ t.m}^2$  and  $EA = 40000 \text{ t}$ ).



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



(9) Find  $Y_F$  for the shown trussed frame ( $EI=10000 \text{ t.m}^2$  and  $EA = 40000 \text{ t}$ ).



Good Luck

Dr. Mohammad Mohie Eldin