EWCE-311

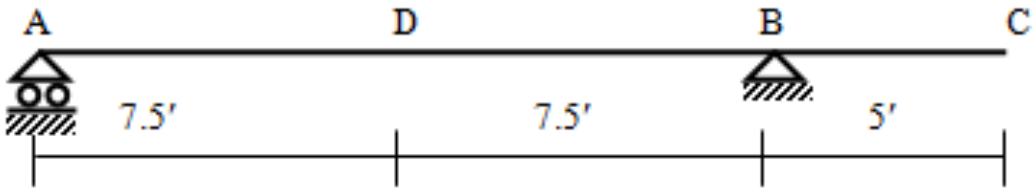
Structural Analysis And Design-I

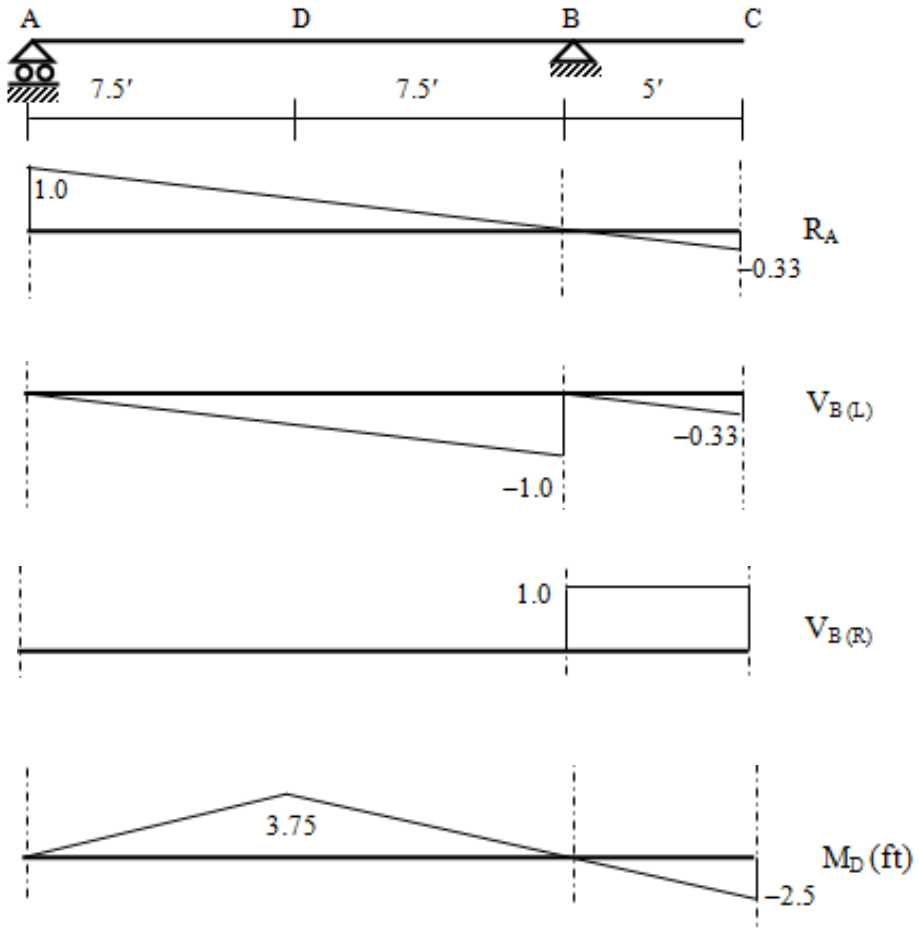
Influence line of determinate beam

Instructor: Dr. Noor Md. Sadiqul Hasan

Influence Line of Beam

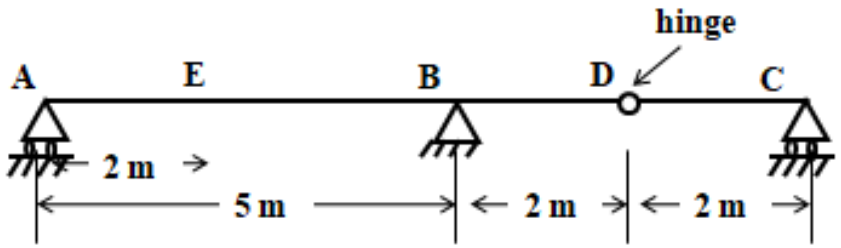
Draw the influence lines RA, VB(L), VB(R) and MD and MB the beam shown below



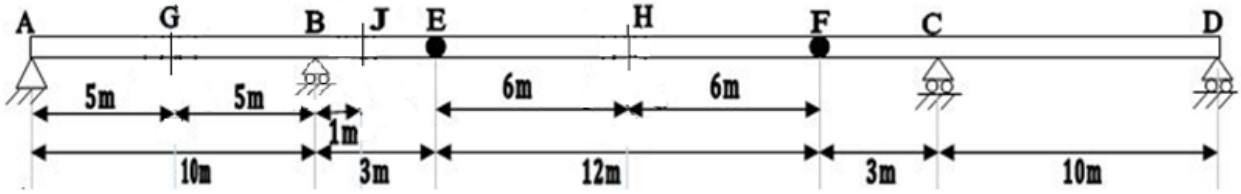

A
D
B
C
7.5′
7.5′
5′
1.0
R_A
−0.33
$V_{B\,(L)}$
−0.33
−1.0
1.0
$V_{B\,(R)}$
3.75
M_D (ft)
−2.5

Influence Line of Beam

Draw IL of RA, RB, RC, VE, VB(L), VB(R), Vc , VD , MB, ME

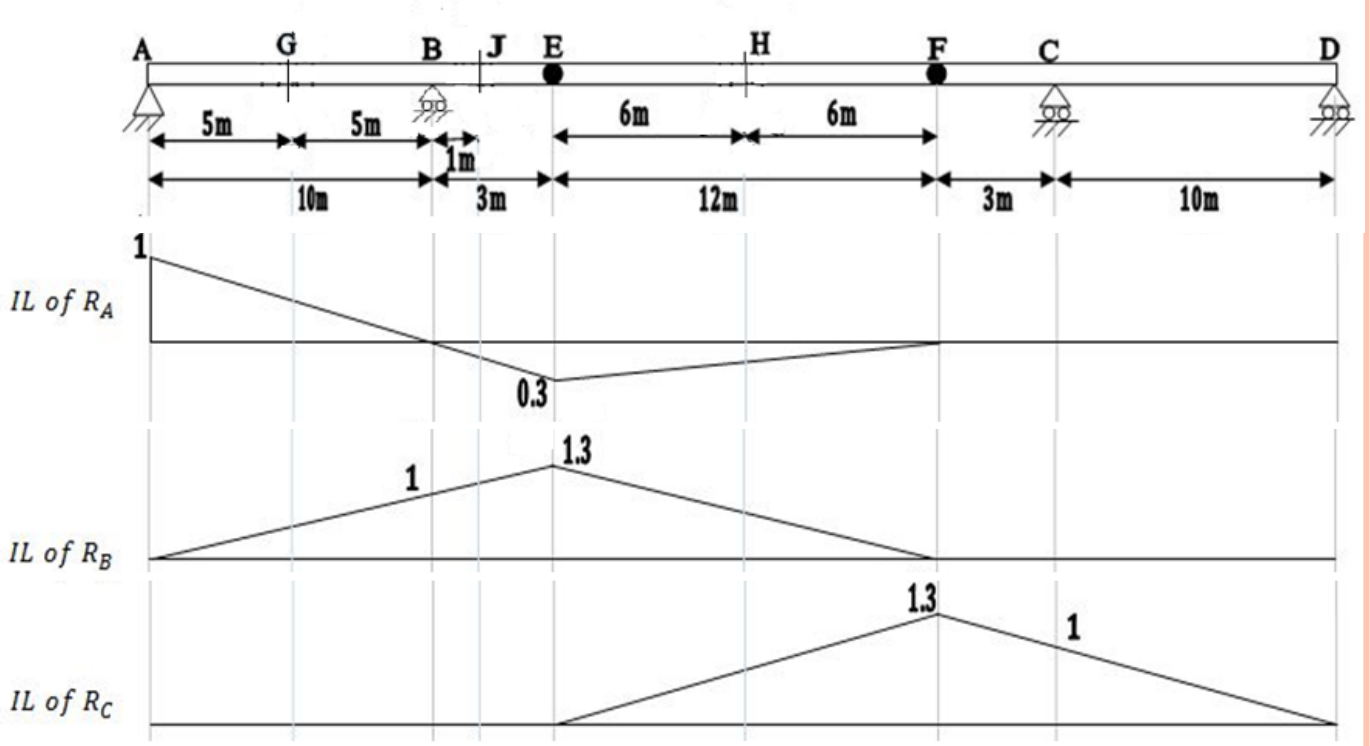


Draw IL of RA, RB, RC, RD, VG, VJ, VH, MG, MJ, MH

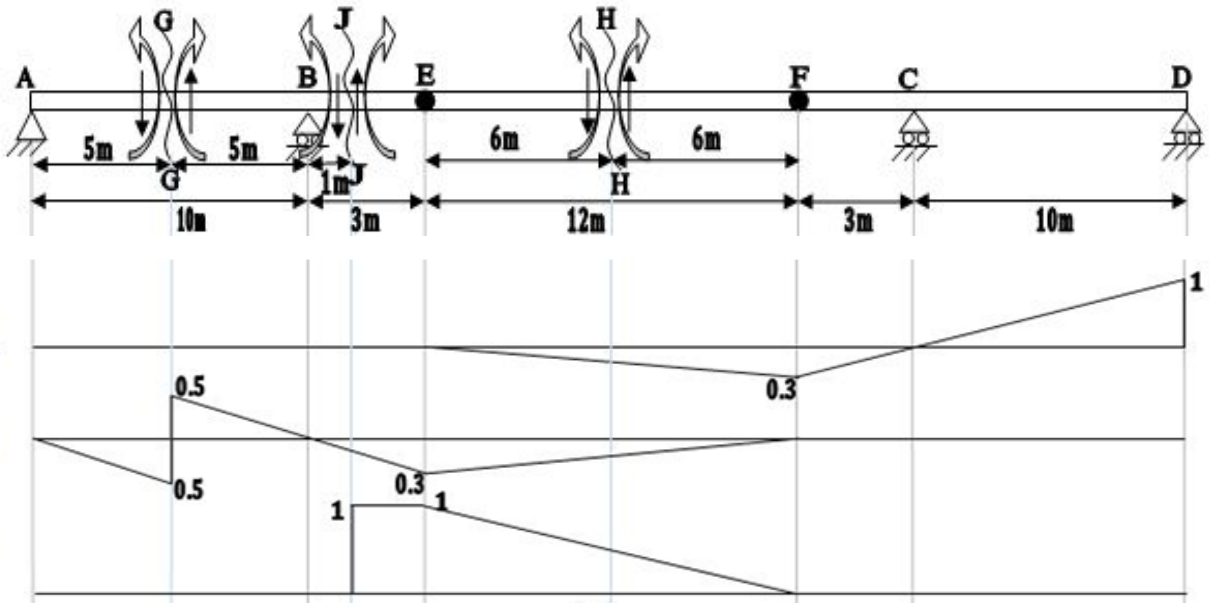


Influence Line of Beam

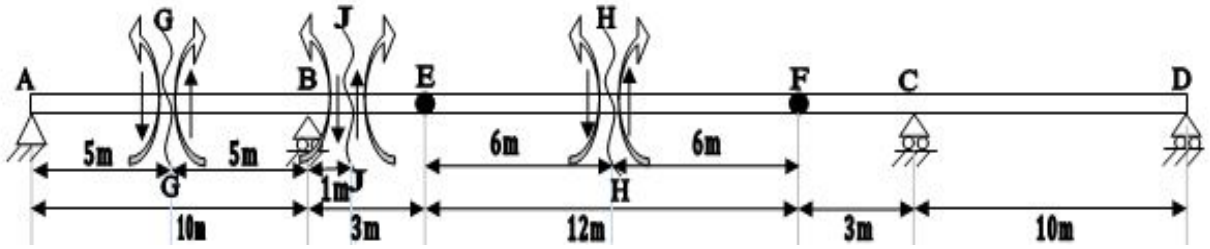
Draw IL of RA, RB, RC, RD, VG, VJ, VH, MG, MJ, MH

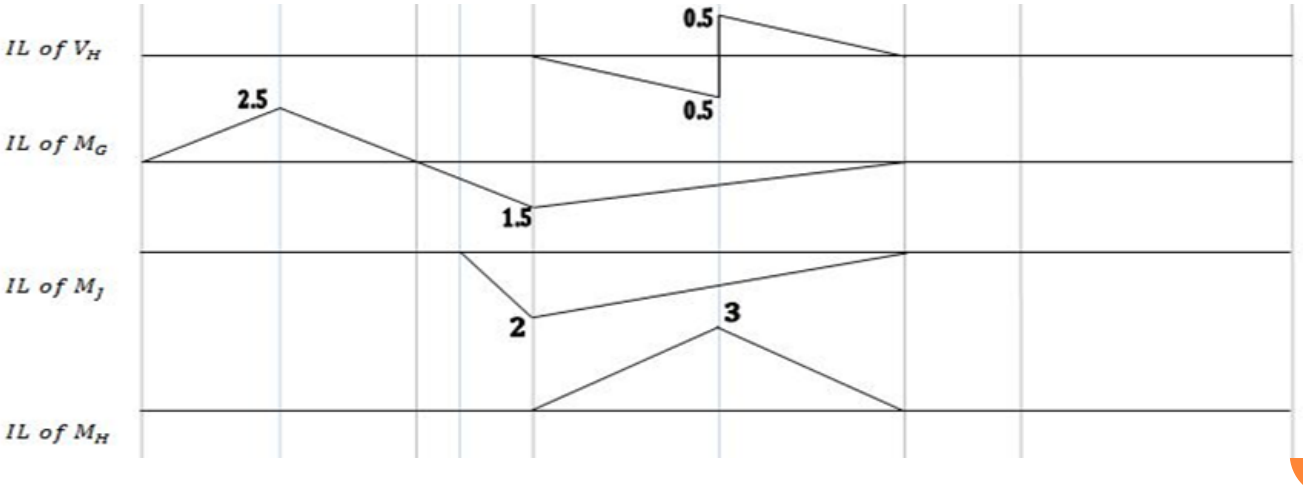


Influence Line of Beam



Influence Line of Beam



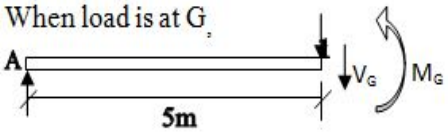


Influence Line of Beam

Influence Lines (Calculation)

IL of M_G

When load is at G,



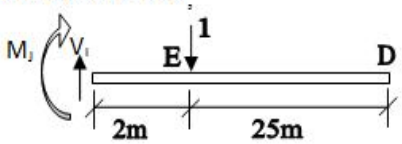
$\therefore \sum M_G = 0 \quad (+)$

$0.5*5 - M_G = 0$

$\therefore M_G = 2.5$ KN-m

IL of M_J

When load is at E,



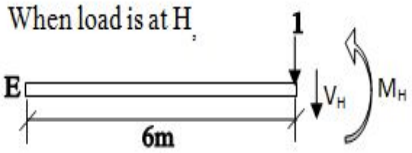
$\therefore \sum M_J = 0 \quad (+)$

$2*1 + M_J = 0$

$\therefore M_J = -2$ KN-m

IL of M_H

When load is at H,



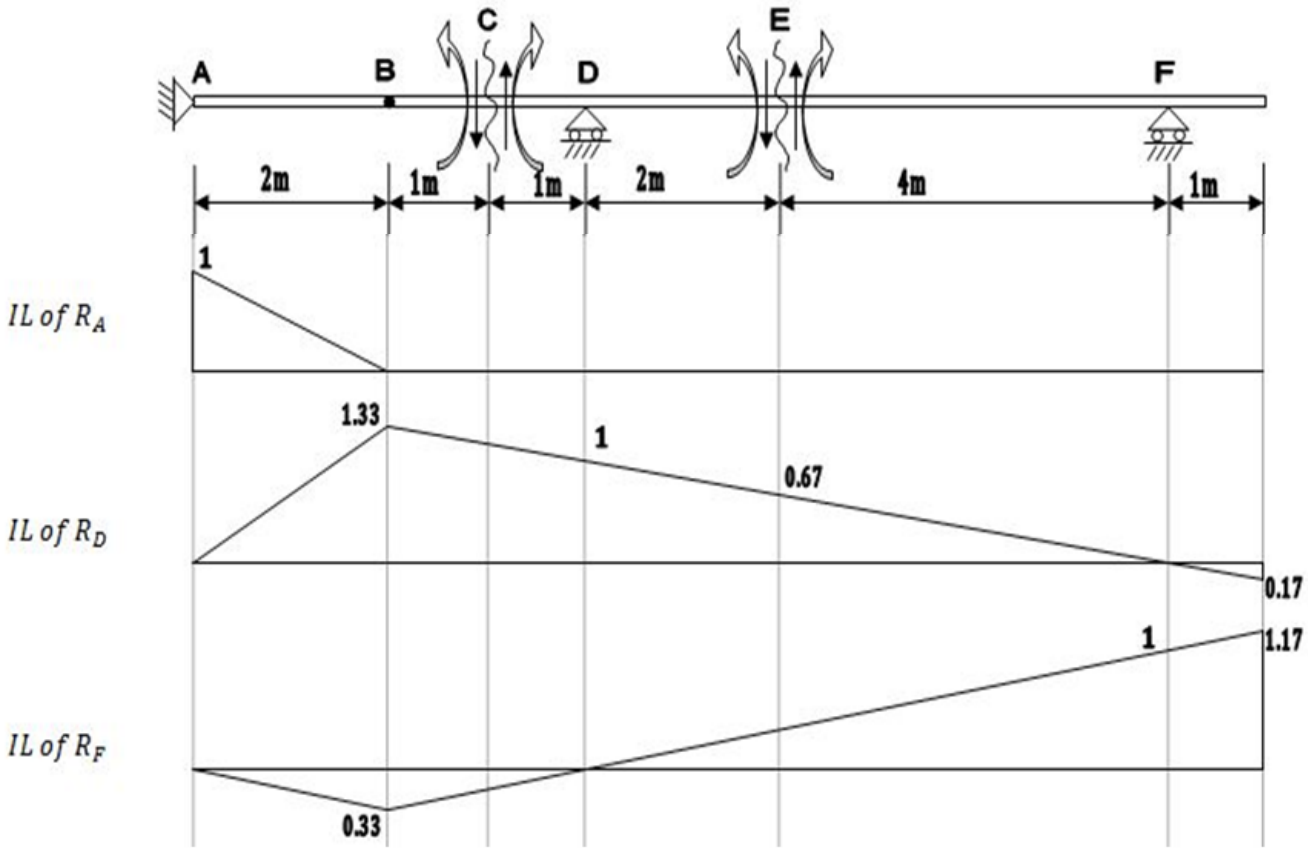
$\therefore \sum M_H = 0 \quad (+)$

$0.5*6 - M_H = 0$

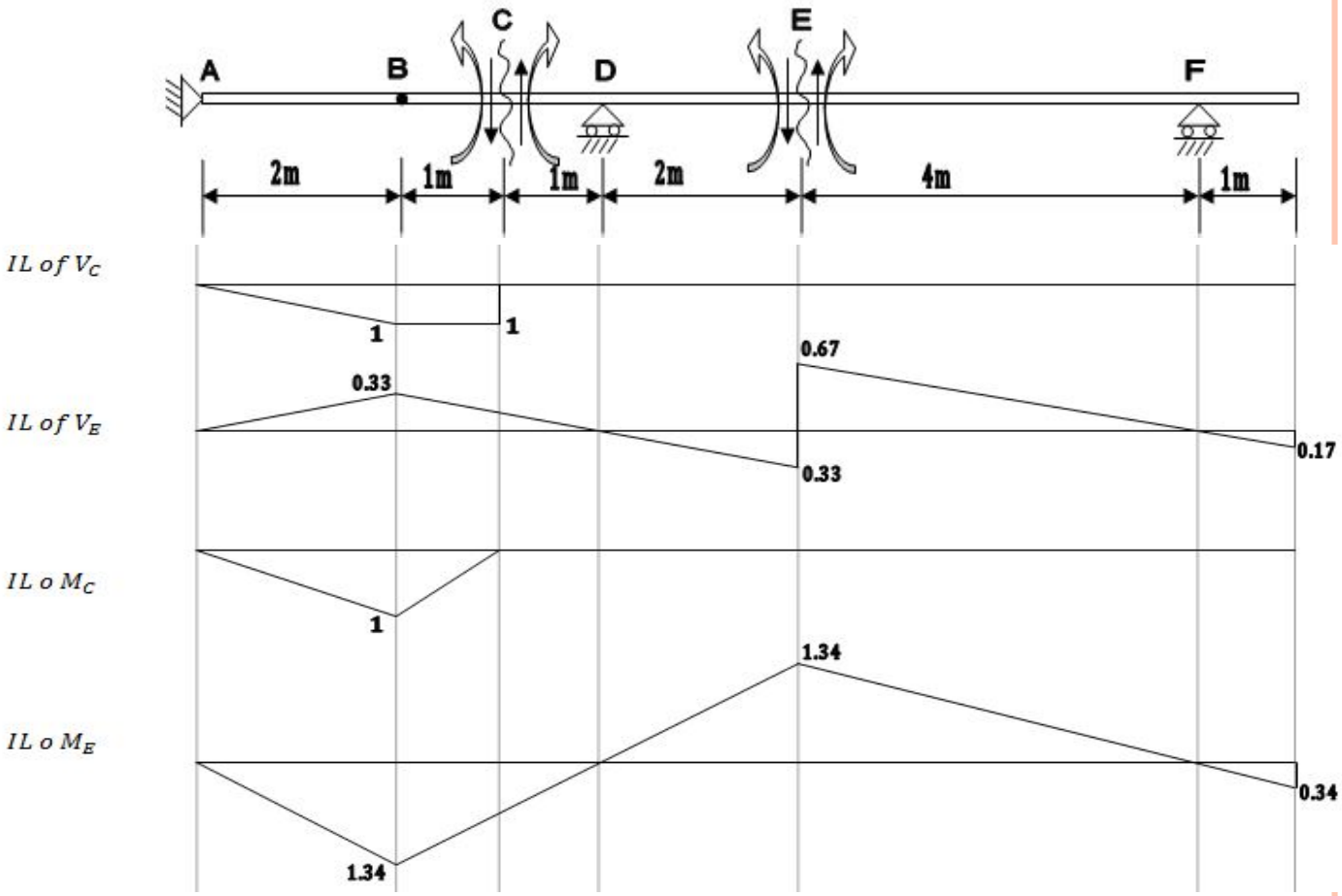
$\therefore M_H = 3$ KN-m

Influence Line of Beam

Draw IL of RA, RD, RF, VC, VE, MC, ME

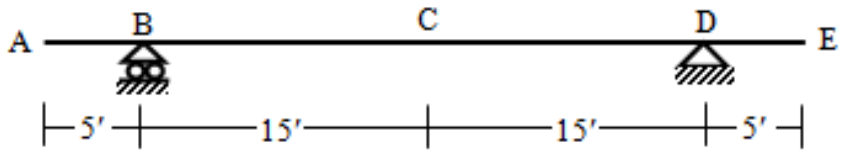


Influence Line of Beam

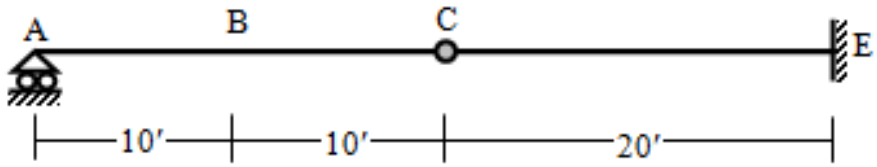


Practice Problems on Influence Lines of Beams

Example 1: For the beam shown below, draw the influence lines for (i) RB, (ii) VBL, VBR, VC, (iii) MB, MC.



Example 2: For the beam shown below, draw the influence lines for (i) RA, RE, (ii) VB, VCL, VCR, (iii) MB, ME.



C is an Internal Hinge