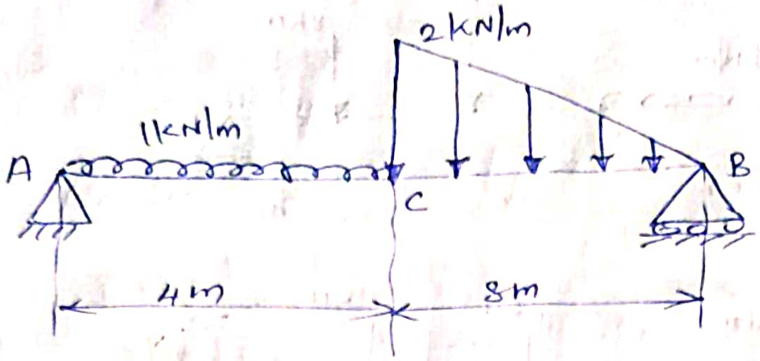
(15) Calculate the support reactions of the simply supported beam show in figure.



<u>Converting UDL into point Load.</u>

Total Load, $W = 1 \times 4 = 4\,KN$

Point of application $x = l/2 = \frac{4}{2} = 2$

$x_1 = 2\,m$ from support A

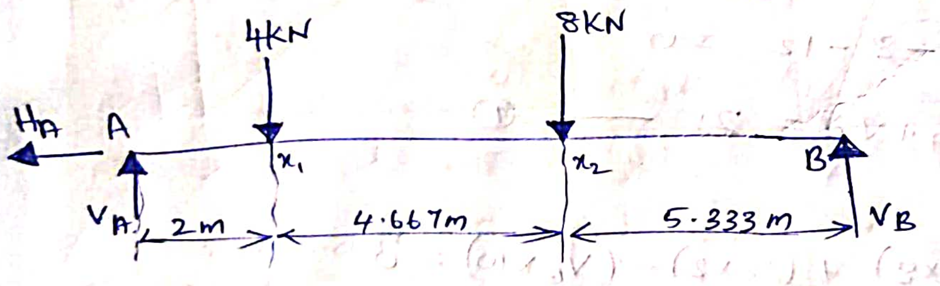
<u>Converting UVL into point Load:</u>

Total Load $W = \frac{2 \times 8}{2} = 8\,KN$

Point of application, $x = [4 + (l/3)]$ from A

$= 4 + 2.667$

$x_2 = 6.667$ from A



$(\rightarrow +) \Sigma H = 0$; $H_A = 0$

$(\uparrow +) \Sigma V = 0$; $V_A - 4 - 8 + V_B = 0$

$V_A + V_B = 12$ —— ①

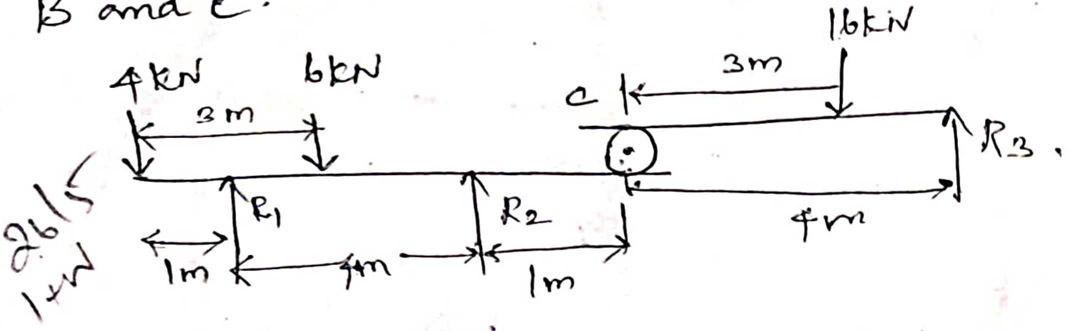
$(\curvearrowright +) \Sigma M_A = 0$; $(4 \times 2) + (8 \times 6.667) - (V_B \times 12)$

$12 V_B = 8 + 53.36$

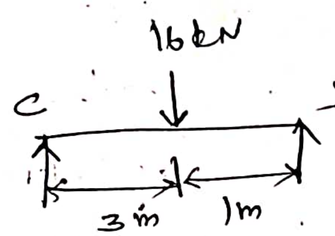
$V_B = 5.11\,KN \uparrow$

Sub in ① $V_A = 6.89\,KN \uparrow$

(P) Calculate the rnx R_1, R_2 and R_3 for 2 beams AB and CD supported as shown. There being a hinge connecting B and C.



Considering the beam CD



$\Sigma v = 0$

$R_C + R_3 - 16 = 0$

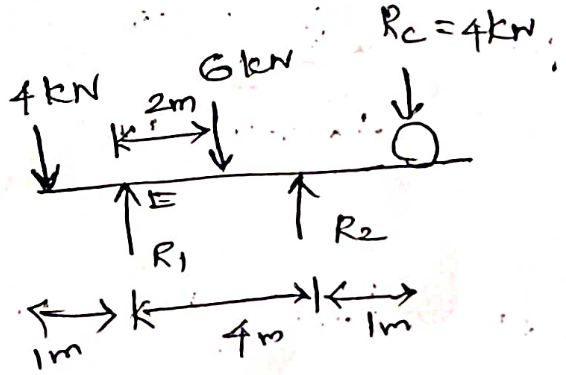
$R_C + R_3 = 16 \rightarrow (1)$

$\Sigma M_C = 0$

$(16 \times 3) - (R_3 \times 4) = 0$

$R_3 = 12\ kN$ $\boxed{R_C = 4\ kN}$

Consider Beam AB



$\Sigma v = 0$

$R_1 + R_2 - 4 - 6 - 4 = 0$

$R_1 + R_2 = 14 \rightarrow (1)$

$\Sigma M_E = 0$

$(6 \times 2) + (4 \times 5) - (4 \times 1) - (R_2 \times 4) = 0$

$\boxed{R_2 = 7\ kN}$ $\boxed{R_1 = 7\ kN}$