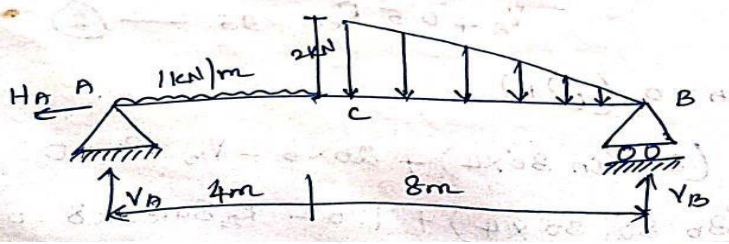
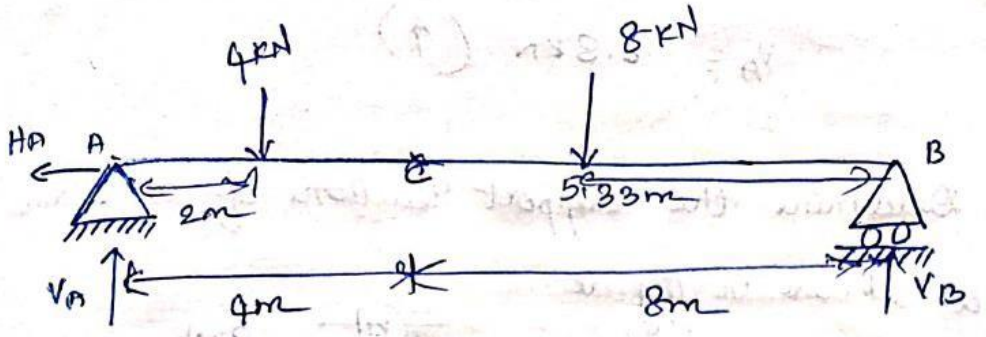
4. Calculate the Support Reactions of a CSB beam shown in figure.





Total downward load of UDL = $1 \times 4 = 4KN$
acts at midpoint

Total downward Triangular load = $\frac{1}{2} \times 8 \times 2$
load acts at centroid $\left(\frac{2}{3} \times 8\right)$
$= 8KN$

* $\Sigma H = 0$

$H_A = 0$

* $\Sigma V = 0$

$$V_A + V_B - (1 \times 4) - (\tfrac{1}{2} \times 8 \times 2) = 0$$

(or) $V_A + V_B - 4 - 8 = 0$

$$V_A + V_B = 12 \quad \text{— (1)}$$

* $\Sigma M_A = 0$

$$(4 \times 2) + [8 \times (12 - 5.33)] - V_B \times 12 = 0.$$

$$12 V_B = 8 + 53.36$$

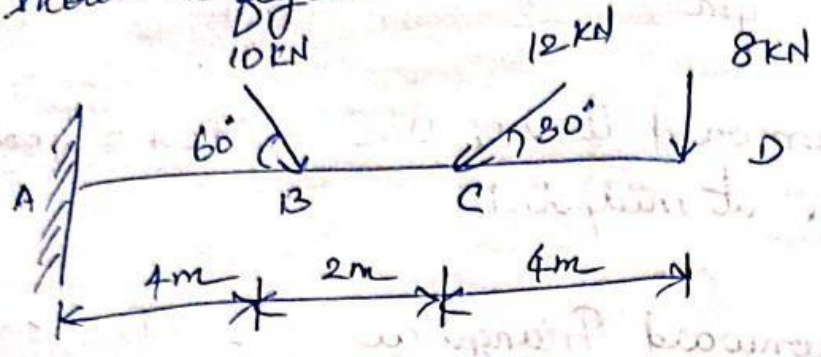
$$V_B = 5.11 \text{ KN} \ (\uparrow)$$

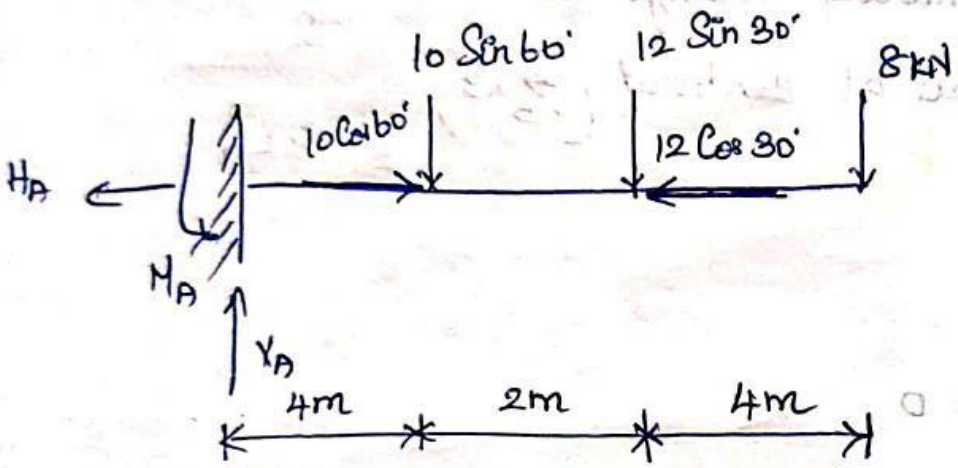
Sub V_B in (1)

$$V_A + V_B = 12$$

$$V_A = 6.8 \text{ KN} \ (\uparrow)$$

5. Determine the Support Reactions of a beam as shown in figure.





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

$10 \cos 60° - 12 \cos 30° - H_A = 0$

$\therefore H_A = -5.392 \text{ kN}$ (∵ Negative Charge Direction)

$H_A = 5.392 \text{ kN} \ (\rightarrow)$

$\Sigma V = 0 \ (\uparrow +)$

$V_A - 10 \sin 60° - 12 \sin 30° - 8 = 0$

$\Sigma M_A = 0 \ (\circlearrowleft +)$

$(10 \sin 60^\circ \times 4) + (12 \sin 30^\circ \times 6) + (8 \times 10) - M_A = 0$

$M_A = 34.64 + 36 + 80$

$= 150.64 \text{ kNm} \ (\circlearrowleft)$

Result :

$H_A = 5.392 \text{ kN} \ (\rightarrow)$

$V_A = 22.66 \text{ kN} \ (\uparrow)$

$M_A = 150.64 \text{ kNm} \ (\circlearrowleft)$