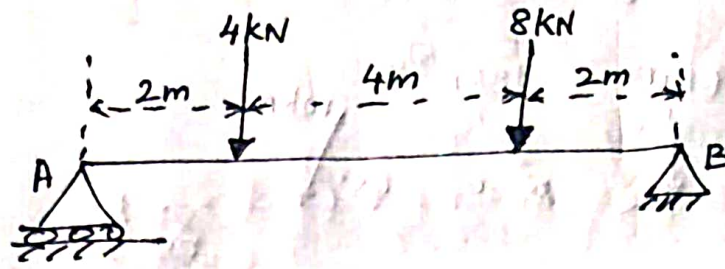
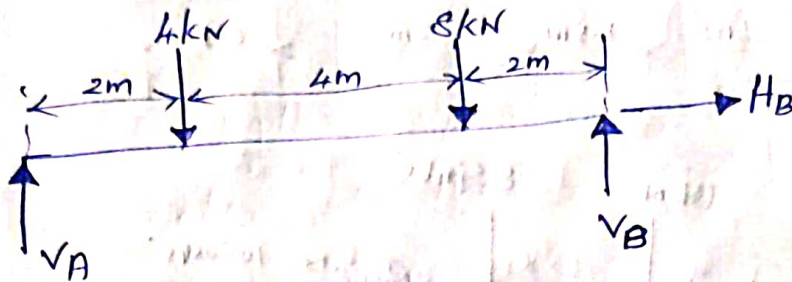


(2) Find the support reaction of the simply supported beam shown in figure



Soln:



Applying  $\sum H = 0$  ( $\leftarrow \rightarrow +$ )  
 $H_B = 0$  { There are "no external horizontal forces" acting: Therefore no horizontal reaction }

Applying  $\sum V = 0$  ( $\uparrow +$ )

$$V_A + V_B - 4 - 8 = 0$$

$$V_A + V_B = 12 \quad \text{--- (1)}$$

$\sum M_A = 0$  ( $\curvearrowright +$ )

$$\sum M_A = (4 \times 2) + (8 \times 6) - (V_B \times 8) = 0$$

$$V_B = \frac{8 + 48}{8} = 7 \text{ kN}$$

$$\boxed{V_B = 7 \text{ kN}} \quad \text{--- (2)}$$

Sub (2) in (1)

$$V_A + 7 = 12$$

$$\boxed{V_A = 5 \text{ kN}}$$

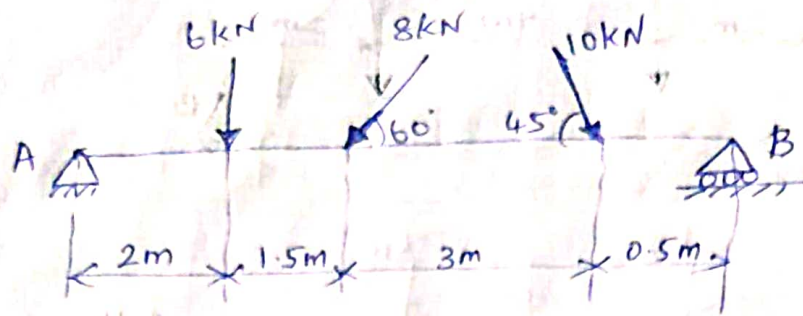
Result:

$$H_B = 0$$

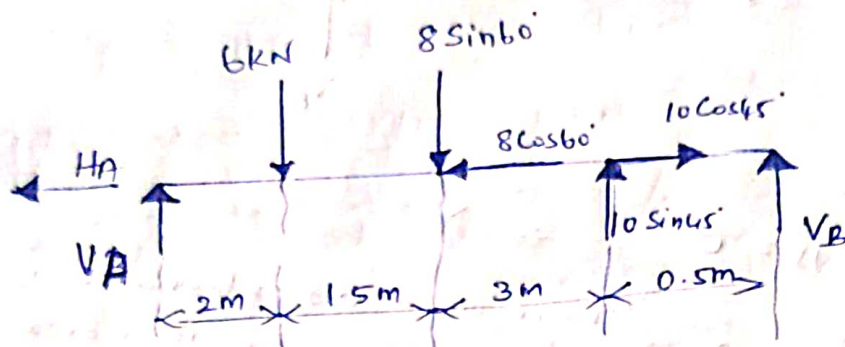
$$V_A = 5 \text{ kN } \uparrow$$

$$V_B = 7 \text{ kN } \uparrow$$

⑬ Determine the support reactions of the shown in fig.



Soln:



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

$$10 \cos 45^\circ - 8 \cos 60^\circ - H_A = 0$$

$$\boxed{H_A = 3.07 \text{ kN}} \quad \leftarrow$$

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

$$V_A + V_B - 6 - 8 \sin 60^\circ - 10 \sin 45^\circ = 0$$

$$V_A + V_B = 19.99 \approx 20 \quad \text{--- (1)}$$

$$\Sigma M_A = 0 \quad (\curvearrowright +)$$

$$\Sigma M_A = (6 \times 2) + (8 \sin 60^\circ \times 3.5) + (10 \sin 45^\circ \times 6.5) - (V_B \times 7) = 0$$

$$V_B \times 7 = 82.2$$

$$\boxed{V_B = 11.74 \text{ kN}} \quad \uparrow \quad \text{--- (2)}$$

Sub (2) in (1)

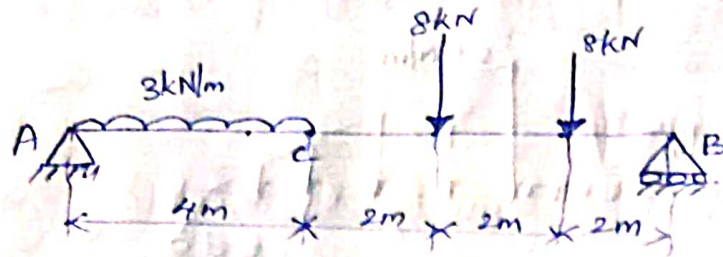
$$V_A + V_B = 20$$

$$V_A = 20 - 11.74 = 8.26 \text{ kN}$$

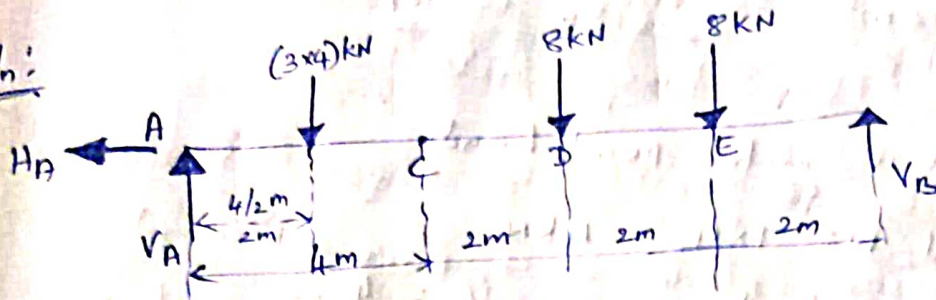
$$\boxed{V_A = 8.26 \text{ kN}} \quad \uparrow$$



14) A beam ABC of span 10m is loaded as shown in fig. Determine the reactions at A & B.



S/n:



Converting UDL into point load.

$$\text{Total value of load } W = 3 \times 4 = 12 \text{ kN}$$

$$\text{Point of application of } W = \frac{4}{2} = 2 \text{ m from point A}$$

$$\underline{\Sigma H = 0} \quad (\rightarrow +)$$

$$H_A = 0 \quad \left\{ \text{There are no external horizontal forces} \right\}$$

$$\underline{\Sigma V = 0} \quad (\uparrow +)$$

$$V_A + V_B - 8 - 8 - 12 = 0$$

$$V_A + V_B = 28 \quad \text{--- (1)}$$

$$\underline{\Sigma M_A = 0} \quad (\text{Clockwise } +)$$

$$(8 \times 6) + (8 \times 8) + (12 \times 2) - (V_B \times 10) = 0$$

$$\boxed{V_B = 13.6 \text{ kN}} \quad \uparrow$$

Sub in (1)

$$\boxed{V_A = 14.4 \text{ kN}} \quad \uparrow$$