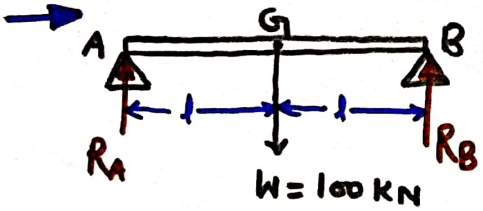
TO FIND THE REACTIONS OF BEAM SUPPORTS :-

(1) $\Sigma M = 0$
(2) $\Sigma F = 0$

} By solving these two equations we can get reactions at the supports.

SIMPLY SUPPORTED BEAM :-

Question :- There is a 100 KN load at the centre of the beam as shown below. Find the reactions at the supports. **BTEUP 1974**



Solve :-

from :

$$\Sigma F = 0$$

$$+R_A + R_B - 100 = 0$$

$$R_A + R_B = 100\ KN \quad \text{——①}$$

Now from;

$$\Sigma M_A = 0$$

$$R_A \times 0 + 100 \times AG) + R_B \times AB) = 0$$

$$0 - 100\,AG) + R_B \times AB) = 0$$

$$-100 \times l + R_B \times 2l = 0 \Rightarrow 2l \times R_B = 100l$$

$$R_B = \frac{100}{2} = 50\ KN\ (\uparrow \text{ward})$$

from equation ① -

$$R_A + 50 = 100\ KN$$

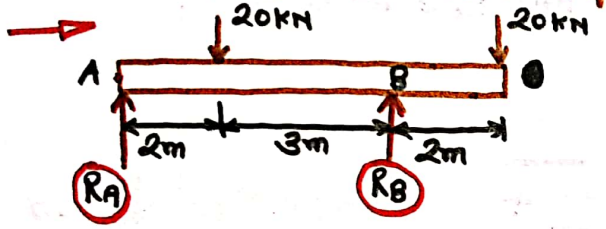
$$R_A = 50\ KN\ (\uparrow \text{ward})$$

So; $\{R_A = 50KN\ ;\ R_B = 50KN\}$ Ans

Beam with Overhanging at one ends :-

B.T.E.U.P. 1976

Question:- Find the reactions at point A and B as shown in fig.



Solve:- from: $\Sigma F = 0$ *

$$R_A + R_B - 20 - 20 = 0$$

$$R_A + R_B = 40\,KN \quad \text{—— (1)}$$

Now, from $\Sigma M_A = 0$ *

$$R_A \times 0 + 20 \times 2 + R_B \times 5 + 20 \times 7 = 0$$

$$-20 \times 2 + 5R_B - 140 = 0$$

$$-40 + 5R_B - 140 = 0$$

$$R_B = \frac{180}{5} = 36\ KN.\ (\uparrow ward)$$

from equation - (1)

$$R_A + 36 = 40\ KN$$

$$R_A = 40 - 36$$

$$[R_A = 4\ KN]\ (\uparrow ward)$$

upward

So; $[R_A = 4KN;\ R_B = 36\ KN]$