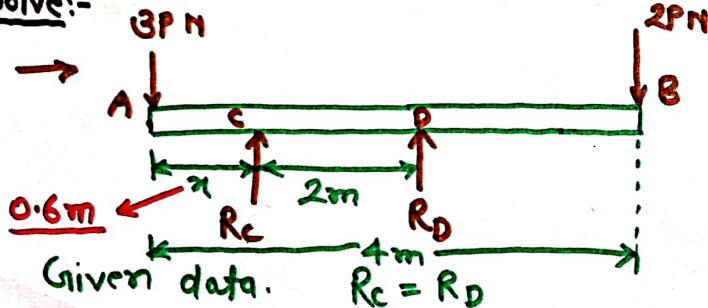


Overhanging at both ends:-

BTEVP- 1991

Question:- A 4m long rod AB is supported at two points C and D, whose span is 2m. There are 2 downward loads 3PN and 2PN at A and B respectively. If $R_C = R_D$ then find distance 'x' which is from A to C. Neglect weight of the beam.

Solve:-



To find:- x in m.

→ $\Sigma F = 0$:-

$$+R_C + R_D - 3P - 2P = 0$$

$$R_C + R_D = 5P$$

$$\therefore R_C = R_D$$

$$\bullet R_C = \frac{5P}{2} \Rightarrow 2.5PN$$

$$R_C = R_D = 2.5PN \quad \text{--- (1)}$$

→ $\Sigma M_A = 0$:-

$$3P \times 0 + R_C \times x + R_D \times (x+2) - 2P \times 4 = 0$$

$$\left(\frac{5P}{2}\right)x + \left(\frac{5P}{2}\right)(x+2) - 8P = 0$$

$$2.5P(x+2+x) = 8P \quad \left| \quad 2x = \frac{16}{5} - 2 \right.$$

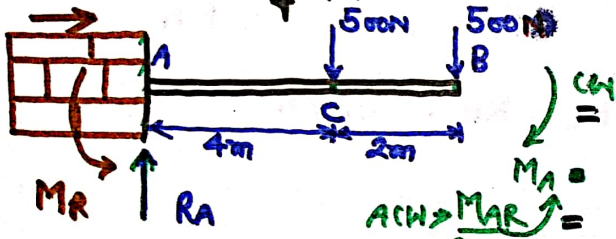
$$2.5(2x+2) = 8 \quad \left| \quad 2x = 1.2 \right.$$

$$2+2x = \frac{8 \times 2}{5} = \frac{16}{5} \quad \left| \quad \boxed{x = 0.6m} \right. \checkmark$$

Cantilever beam :-

8TEUP - 1977 : 2007

Question:- Find the reaction and Moment at fixed corner as shown in diagram.



Solve:- To find out (i) R_A (N).
(ii) M_A (N-m).

* $\sum F = 0$

$$(i) +R_A - 500 - 500 = 0$$

$$R_A = 1000 \text{ N} \quad \text{--- ① (upward).}$$

Ans.

$$(ii) \sum M_A = 0$$

$$-500 \times 4 - 500 \times 6 = 0$$

$$\Rightarrow M_A = -5000 \text{ N-m} \quad (M_A = 5000 \text{ N-m} \downarrow)$$

$$\Rightarrow M_R = 5000 \text{ N-m} \quad (M_R = 5000 \text{ N-m} \uparrow)$$

$$\therefore \left\{ \begin{array}{l} \text{① } R_A = 1000 \text{ N } \uparrow \\ \text{② } M_A = 5000 \text{ N-m } \downarrow \end{array} \right\}$$