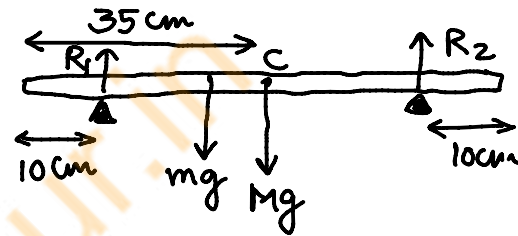


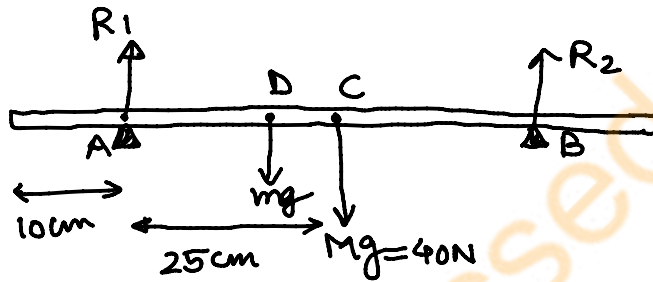
Example: A uniform metal bar of length 70cm and mass 4.0 kg is placed horizontally on two knife edges pivoted at 10cm from each end of the rod. A 6.0kg weight is suspended at 30cm from one end. Find the reactions at the knife edges. Take $g = 9.8\text{m/s}^2$.
 [Ans: 54.88N and 43.12N]

$$g = 10\text{m/s}^2$$

$$M = 4\text{kg}, L = 70\text{cm}$$



$$m = 6\text{kg}$$



$$mg = 60\text{N}, AD = 20\text{cm}$$

$$AB = 50\text{cm}$$

$$\text{For } \sum F_y = 0 \Rightarrow R_1 + R_2 - Mg - mg = 0 \Rightarrow R_1 + R_2 = Mg + mg$$

$$R_1 + R_2 = 40\text{N} + 60\text{N}$$

$$R_1 + R_2 = 100\text{N} \quad \text{--- (1)}$$

$$\text{For } \sum \tau = 0 \text{ (about A)} \Rightarrow R_1 \times 0 + R_2 \times AB - mg \times AD - Mg \times AC = 0$$

$$R_2 \times 0.5 - 60 \times 0.2 - 40 \times 0.25 = 0$$