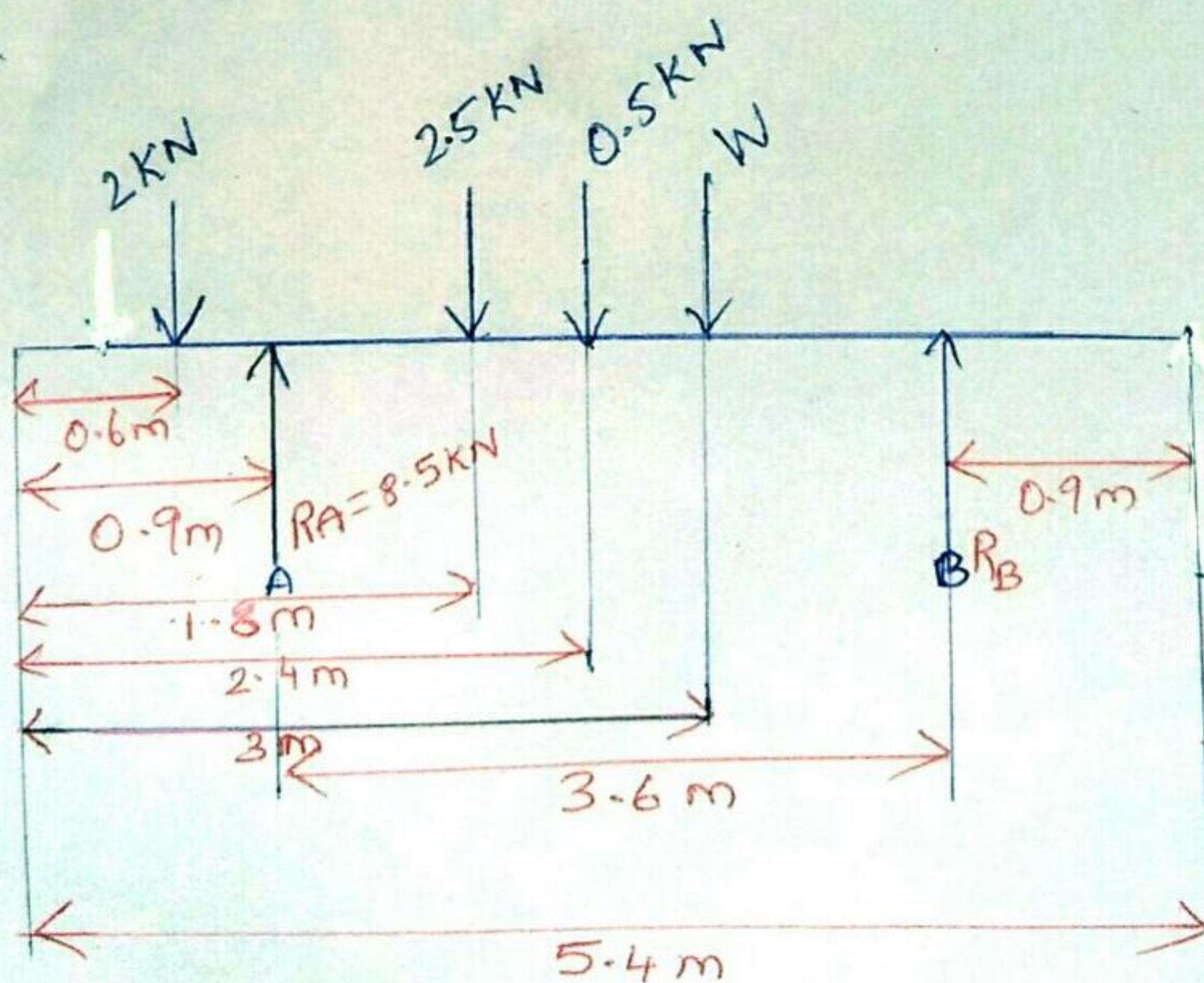


A bus chassis 5.4 m long, consist of 2 side members and a number of cross members. Each side member can be considered as beam, simply supported at two point A and B, 3.6m apart. A being positioned 0.9 m from the front end of the frame and subjected to the following concentrated loads. Engine support (front) 2 kN, engine support (rear) 2.5 kN, gear support 0.5 kN and body W kN. The distance of these loads from the front end of the frame are respectively 0.6 m, 1.8 m, 2.4 m and 3 m. If the reaction at A is 8.5 kN. determine

- The magnitude of load W due to vehicle body
- The magnitude of support reaction at B

Given data:



To find:

(i) W

(ii) R_B

Solution:

Taking moment about R_B

$$- (R_A \times 3.6) + (W \times 1.5) + (0.5 \times 2.1) + (2.5 \times 2.7) + 2(3.6) = 0$$

$$- (8.5 \times 3.6) + 1.5W + 1.05 + 6.75 + 7.2 = 0$$

$$-30.6 + 1.5W + 1.05 + 6.75 + 7.2 = 0$$

$$\boxed{W = 10 \text{ kN}}$$

$$\sum V = 0$$

$$R_A + R_B = 2 + 2.5 + 0.5 + W$$

$$8.5 + R_B = 2 + 2.5 + 0.5 + 10$$

$$\boxed{R_B = 6.5 \text{ kN}}$$

Result:

(i) $W = 10 \text{ kN}$

(ii) $R_B = 6.5 \text{ kN}$