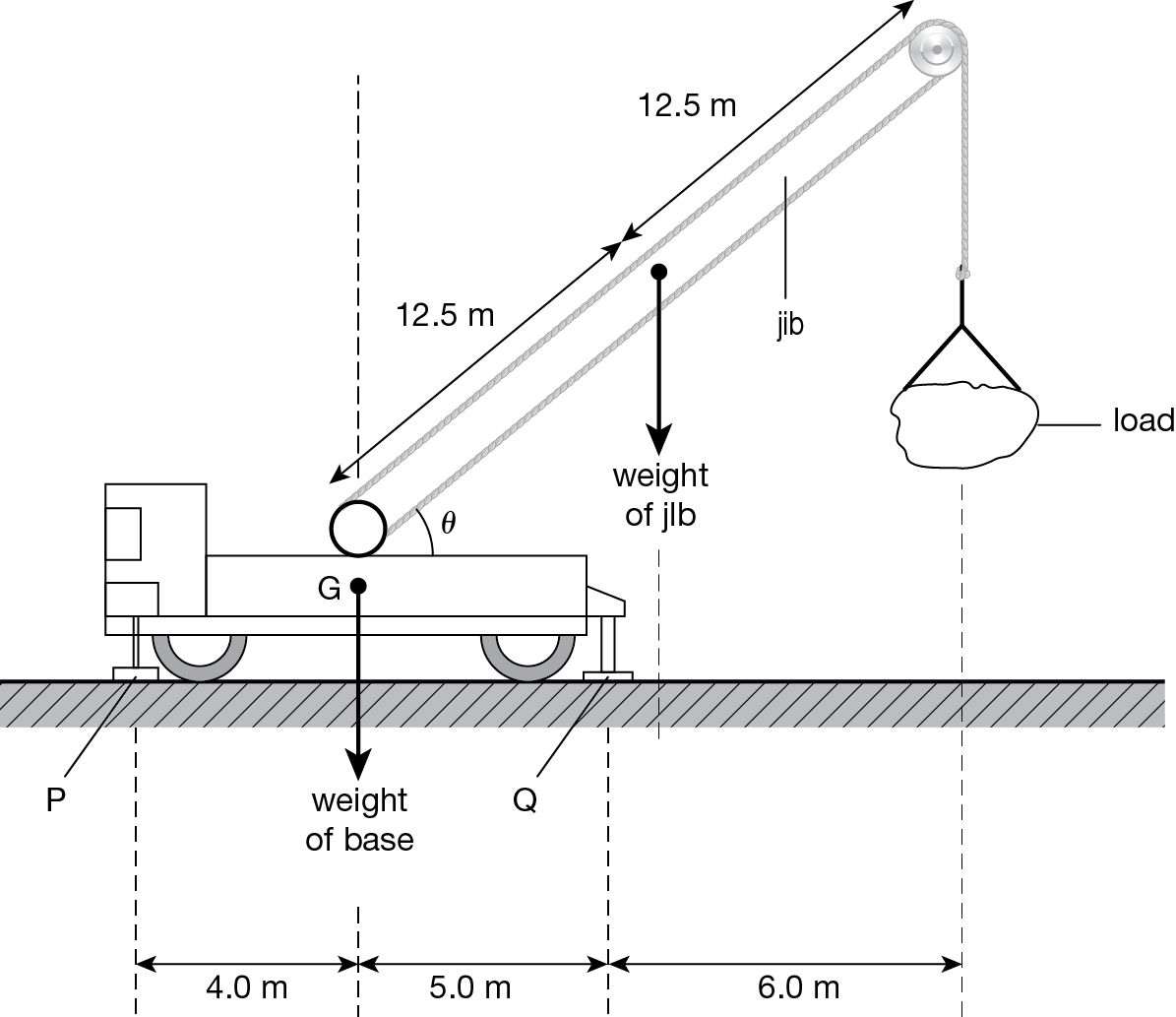
Moments question – Physics style practice

1. **a** State two conditions that are required for an object to be in equilibrium under the action of several forces.

(*2 marks*)

**b** Figure 23 shows a mobile crane used to lift building materials. When lifting, the base of the crane rests on support legs at **P** and **Q**. The base of the crane has a weight of 2.4 × 105 N and acts through its centre of gravity **G**. The telescopic jib has a weight of 2.8 × 104 N, which acts through the centre of the jib when it is fully extended to 25 m.

The crane is used to lift a load of 1.2 × 105 N placed 6.0 m from the support legs at **Q**. The jib is fully extended and at an angle *θ* to the horizontal.



**Figure 23**

Calculate:

* + 1. the total normal contact force at **P**, *FP*

*FP* = N (*3 marks*)

* + 1. the total normal contact force at **Q**, *FQ*.

*FQ* = N (*1 mark*)

