AS Level Physics A

H156/02 Depth in physics

Question Set 10

1. An engineer is investigating the tension in a steel cable supporting a uniform wooden plank as shown in Fig. 4.

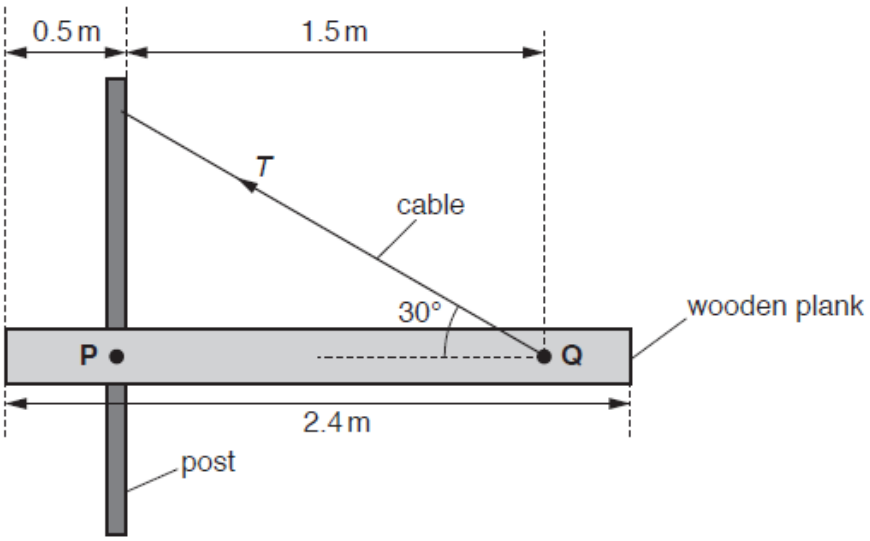

Fig. 4 (not to scale)

The plank is 2.4 m long and has a mass of 50 kg. It is pivoted at point **P** to a vertical post. The cable is fixed to the plank at point **Q** and to the vertical post as shown in Fig. 4. The cable is at an angle of 30° to the plank. The plank is in equilibrium and resting in a horizontal position.

(a) Show that the tension T in the cable is about 460 N.

[4]

(b) The original length of the steel cable is 1.73 m and it has a cross-sectional area of 11.0 mm^2.

The Young modulus of steel is 210 GPa.

Calculate the extension x of the cable shown in Fig. 4.

x = ... m **[3]**

Total Marks for Question Set 10: 7