1 **(a)** **(i)** Define the *moment* of a force about a point.

.....

..... [1]

(ii) Determine the SI base units of the moment of a force.

base units ..... [1]

(b) A uniform rigid rod of length 2.4 m is shown in Fig. 1.1.

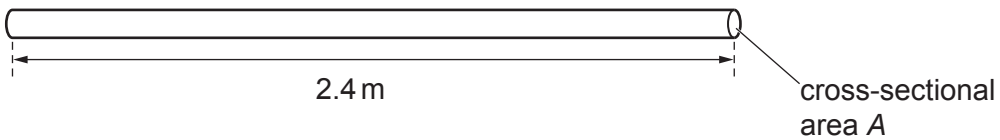

Fig. 1.1

The rod has a weight of 5.2 N and is made of wood of density 790 kg m^{-3}.

Calculate the cross-sectional area A, in mm^2, of the rod.

A = ... mm^2 [3]

(c) A fishing rod AB, made from the rod in **(b)**, is shown in Fig. 1.2.

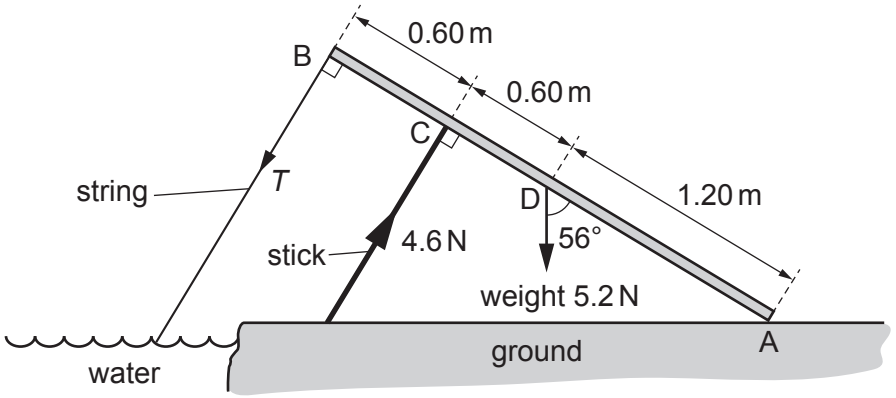

Fig. 1.2 (not to scale)

End A of the rod rests on the ground and a string is attached to the other end B. A support stick exerts a force perpendicular to the rod at point C. The weight of the rod acts at point D.

The tension *T* in the string is in a direction perpendicular to the rod. The rod is in equilibrium and inclined at an angle of 56° to the vertical.

The forces and the distances along the rod of points A, B, C and D are shown in Fig. 1.2.

(i) Show that the component of the weight that is perpendicular to the rod is 4.3 N.

[1]

(ii) By taking moments about end A of the rod, calculate the tension *T*.

T = ... N [3]

[Total: 9]