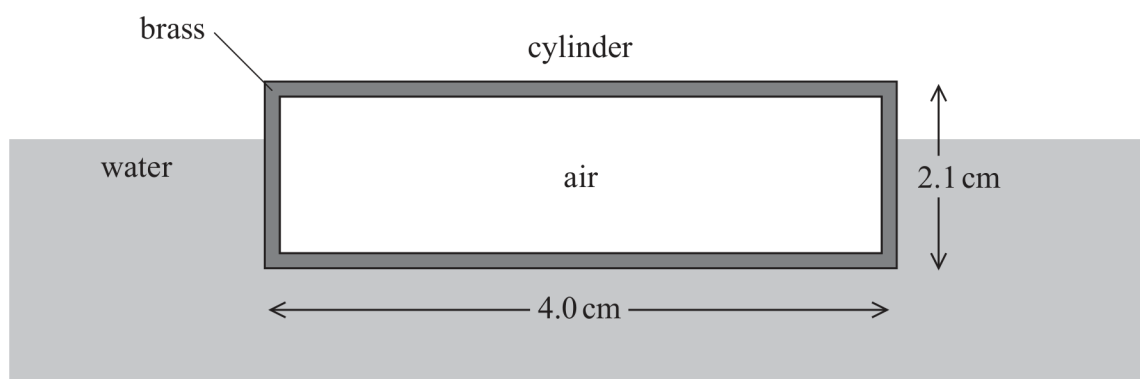


15 A hollow brass cylinder with closed ends is floating on the surface of water.

The cylinder has a length of 4.0 cm and an external diameter of 2.1 cm as shown.



63% of the volume of the cylinder is submerged. The cylinder contains negligible weight of air.

(a) Explain why the brass cylinder floats.

(2)

(b) The density of water is $1.0 \times 10^3 \text{ kg m}^{-3}$

(i) Show that the mass of the cylinder is about $9 \times 10^{-3} \text{ kg}$.

(4)

- (ii) Deduce whether an identical hollow cylinder made of gold would also float.
Assume that the volume of gold is the same as the volume of brass.

$$\text{density of gold} = 19.3 \times 10^3 \text{ kg m}^{-3}$$

$$\text{density of brass} = 8.7 \times 10^3 \text{ kg m}^{-3}$$

(4)

(Total for Question 15 = 10 marks)