

AS Level Physics A
H156/02 Depth in physics

Question Set 3

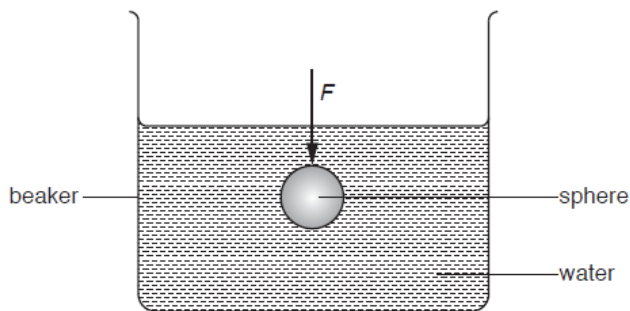
- 1 (a) A solid wooden sphere of density 650 kg m^{-3} has a diameter of 2.8 cm.
- (i) Describe and explain how the student can measure precisely the diameter of the sphere.

[2]

- (ii) Show that the mass of the sphere is 0.0075 kg.

[2]

- (iii) The sphere is pushed below the surface of water as shown in Fig. 3.



Determine the force F that needs to be applied to the sphere to keep the wooden sphere stationary in this position.

density of water = 1000 kg m^{-3}

$F = \dots\dots\dots$ N [2]

- (b)*** A student wishes to investigate how the terminal velocity v of a metal sphere varies with the radius r of the sphere as it travels through a liquid.
It is suggested that

$$v = Kr^2$$

where K is a constant.

Describe with the aid of a suitable diagram how an experiment can be safely conducted, and how the data can be analysed to determine K .

[6]

Total Marks for Question Set 3: 12

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