1.4 Density

01. 0625_w23_qp_43 Q: 1

(a) Oil of density 0.80 g / cm^3 is poured gently onto the surface of water of density 1.0 g / cm^3. The oil and the water do **not** mix.

Describe and explain the final position of the oil relative to the water.

description .....

.....

explanation .....

.....

[2]

(b) An irregularly shaped solid object has a density of 2.7 g / cm^3.

(i) Describe a method to measure the volume of the irregularly shaped solid object.

.....

.....

..... [2]

(ii) The volume of the object is 83 cm^3.

Calculate the mass of the object.

mass = ... [3]

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02. 0625_s21_qp_42 Q: 1

(a) Fig. 1.1 shows a sealed weather balloon which is stationary in still air.

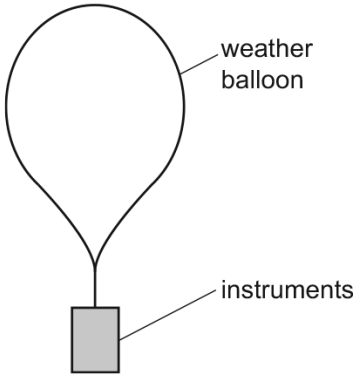

Fig. 1.1

State whether the overall density of the balloon and its instruments is greater than, less than, or the same as the density of the surrounding air.

..... [1]

(b) At night, the gas inside the balloon cools. The pressure of the air outside the balloon remains the same.

(i) State whether the balloon rises, falls or remains stationary.

..... [1]

(ii) Explain your answer.

.....

.....

..... [2]

(c) An object is released from the balloon. It starts at rest and eventually reaches a constant speed.

(i) On the axes of Fig. 1.2, sketch a speed–time graph to show this motion.

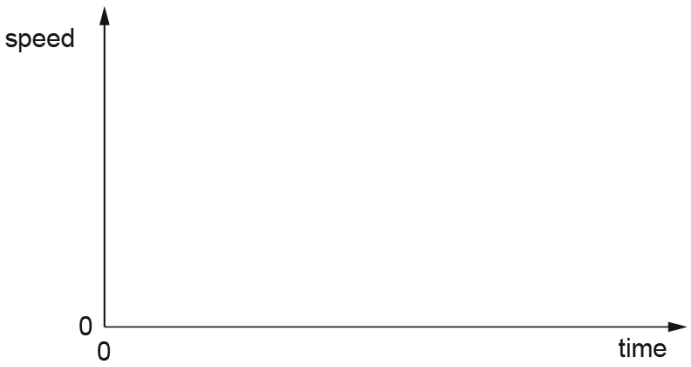

Fig. 1.2

[3]

(ii) State the values of the initial acceleration and the final acceleration of the object.

initial acceleration .....

final acceleration .....

[2]

[Total: 9]

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02. 0625_s17_qp_43 Q: 3

A block of wood has a volume of 210 cm^3 and a mass of 180 g.

(a) Calculate the density of the block of wood.

density = ...[2]

(b) The block is held just above the surface of a liquid of density 0.88 g/cm^3.

Predict and explain what happens when the block is released.

.....

.....

.....[2]

[Total: 4]
