

Kinetic Particle Model of Matter

Question Paper

Course	CIE IGCSE Physics
Section	2. Thermal Physics
Topic	Kinetic Particle Model of Matter
Difficulty	Hard

Time Allowed 10

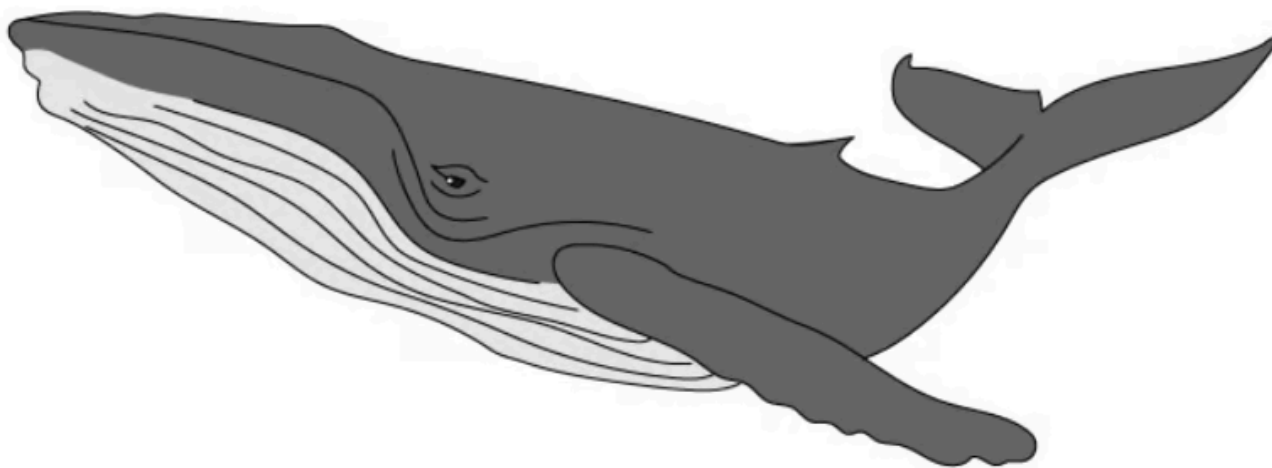
Score /3

Percentage /100

Question 1

Extended tier only

A whale takes a breath at the surface of the ocean, where the pressure is 1.00×10^5 Pa. It then dives to a depth where the pressure is 1.21×10^5 Pa. The temperature is the same at this depth as it is at the surface.



The whale lets out a bubble of air of volume 50 cm^3 . This bubble rises to the surface of the ocean.

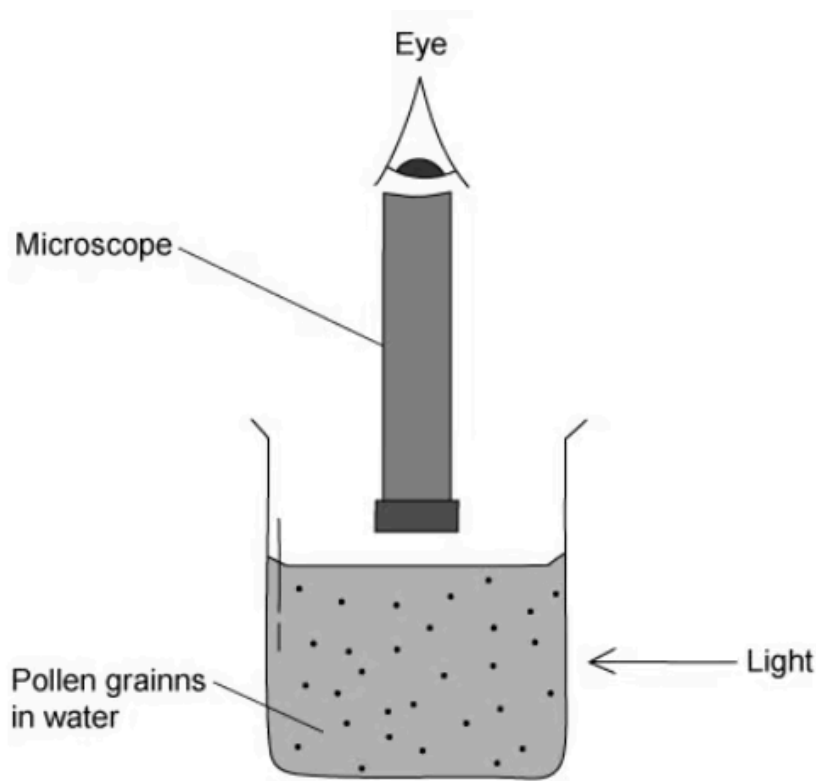
What is the volume of the bubble when it reaches the surface?

- A. 41.3 cm^3
- B. 60.5 cm^3
- C. 50.0 cm^3
- D. 21.0 cm^3

[1 mark]

Question 2

In an experiment to determine the nature of liquids, some very tiny pollen grains are suspended in water. They are illuminated by a bright light, and observed under a microscope.



The view through the microscope is of small, bright dots, which move about at random, rapidly and they frequently change direction.

Which of the following would be the correct explanation for the observation through the microscope?

- A. The bright dots are water molecules, being hit by other water molecules.
- B. The bright dots are water molecules, which are vibrating due to their thermal kinetic energy.
- C. The bright dots are pollen grains, which are being hit many times per second by water molecules.
- D. The bright dots are pollen grains, which are vibrating due to their thermal kinetic energy.

[1 mark]

Question 3

A syringe is half filled with air and sealed. The plunger is then pulled outwards, causing the volume of the gas to increase.

This is done slowly, so that the expansion happens at a constant temperature.

What happens to the pressure of the gas, and to the speed of the air molecules?

	Pressure inside syringe	Speed of air molecules
A	stays the same	stays the same
B	increases	decreases
C	decreases	stays the same
D	decreases	decreases

[1 mark]