

GCSE Physics A (Gateway)

J249/03 Physics A P1-P4 and P9 (Higher Tier)

Question Set 25

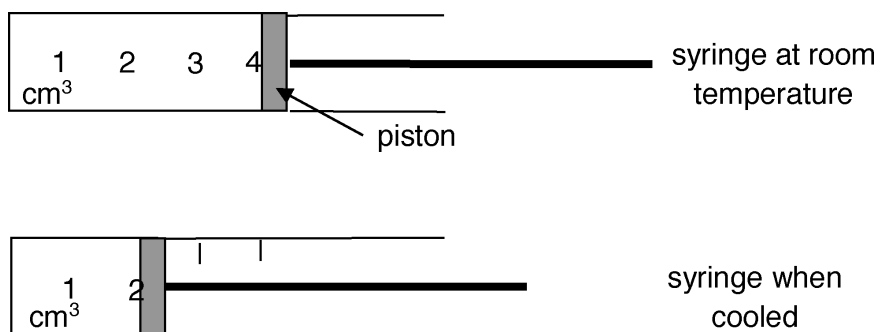
Multiple Choice Questions

P1: Matter

1

A graduated syringe contains air at room temperature. The syringe is put in a freezer to cool it down.

When it is removed from the freezer, the piston has moved inwards.



The density of the air in the syringe when cooled is 2.4 kg/m^3 .

What was the density of the air at room temperature?

- A 0.6 kg/m^3
- B 1.2 kg/m^3
- C 2.4 kg/m^3
- D 4.8 kg/m^3

$$\frac{2.4}{2} = 1.2$$

Your answer

B

[1]

2

A piece of metal has a volume of $2.0 \times 10^{-5} \text{ m}^3$.

The density of the metal is $8.0 \times 10^3 \text{ kg/m}^3$.

What is the mass of the metal?

- A $2.5 \times 10^{-3} \text{ kg}$
- B $4.0 \times 10^{-2} \text{ kg}$
- C $1.6 \times 10^{-1} \text{ kg}$
- D $1.6 \times 10^3 \text{ kg}$

$$\text{density} = \frac{\text{mass}}{\text{volume}}$$

$$\begin{aligned} (8 \times 10^3) \times (2 \times 10^{-5}) &= \text{mass} \\ &= 0.16 \end{aligned}$$

Your answer

C

[1]

3

The atomic model has changed over time.

Why did the model need to change over time?

- A Models only have a finite lifetime
- B Computers were invented
- C The older models could not explain new evidence
- D Peer review

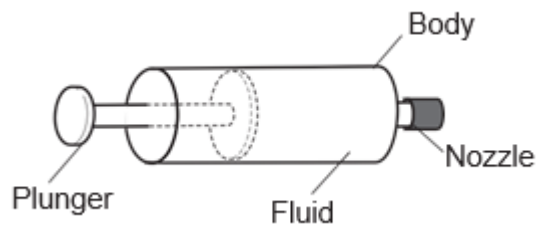
Your answer

C

[1]

4

A fluid is compressed by pushing the plunger into the body of a sealed syringe.



Which of these statements is true?

- A There is a net force towards the plunger.
- B There is no force towards the nozzle.
- C There is a force parallel to all points on the surface of the fluid.
- D There is a force at 90° to all points on the surface of the fluid.

Your answer

D

[1]

5 Which factor influences whether an object floats or sinks?

- A Size of object
- B Depth of water
- C Distance from the shore
- D Density of object

Your answer

D

[1]

6 What is the typical diameter of an atom?

- A 1.0×10^{-15} m
- B 1.0×10^{-10} m
- C $1.0 \mu\text{m}$
- D 1.0 mm

Your answer

B

[1]

7 A liquid has a volume of 0.01 m^3 and a mass of 12 kg.

What is the density of the liquid?

Use the equation: density = mass \div volume

- A 0.12 kg/m^3
- B 12 kg/m^3
- C 120 kg/m^3
- D 1200 kg/m^3

$$\frac{12}{0.01} = 1200$$

Your answer

D

[1]

Total Marks for Question Set 25: 7

Equations in physics

$$(\text{final velocity})^2 - (\text{initial velocity})^2 = 2 \times \text{acceleration} \times \text{distance}$$

$$\text{change in thermal energy} = \text{mass} \times \text{specific heat capacity} \times \text{change in temperature}$$

$$\text{thermal energy for a change in state} = \text{mass} \times \text{specific latent heat}$$

$$\text{energy transferred in stretching} = 0.5 \times \text{spring constant} \times (\text{extension})^2$$

$$\text{potential difference across primary coil} \times \text{current in primary coil} = \text{potential difference across secondary coil} \times \text{current in secondary coil}$$

Higher tier only –

$$\text{force on a conductor (at right angles to a magnetic field) carrying a current} = \text{magnetic flux density} \times \text{current} \times \text{length}$$

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