**SMART EXAM RESOURCES**
**SUBJECT:COORDINATED SCIENCES [ PHYSICS]**
**PAPER 4**
**TOPIC: MOTION**
**SUB-TOPIC: DENSITY/MASS/VOLUME**
**SET 3 QP-MS**

**1** A student conducts an investigation into how the pressure of the gas changes with volume.

The temperature of the gas remains constant.

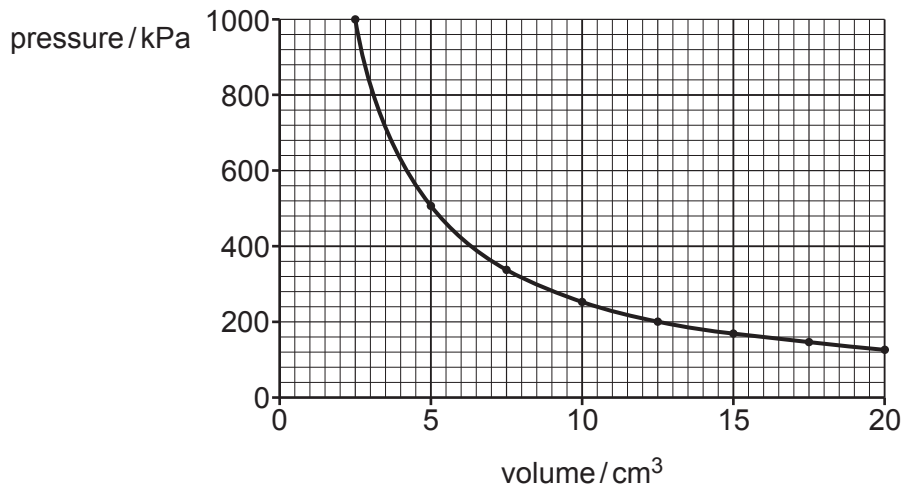Fig. 12.3 shows the results of the student's investigation.



**Fig. 12.3**

**(i)** Use Fig. 12.3 to determine the volume of the sample of gas when the pressure is 500 kPa.

volume = ................................................. cm$^3$  [1]

**(ii)** The mass of the sample of gas is 2.45 g.

Calculate the density of the sample of gas when the pressure is 500 kPa.

density = .............................................. g/cm$^3$  [2]

## MARK SCHEME:

| | | |
|---|---|---|
| (i) | 5 (cm$^3$) ; | **1** |
| (ii) | (density =) m / V **or** 2.45 / 5 ;<br>0.5 (g / cm$^3$) ; | **2** |

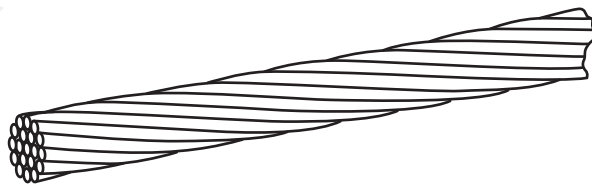**2** Fig. 3.2 shows a section of the zipline's steel cable.



**Fig. 3.2**

The section of steel cable has a mass of 4.2 kg and a volume of $5.0 \times 10^{-4}$ m$^3$.

Calculate the density of the steel cable.

density = ............................................. kg/m$^3$  [2]

# MARK SCHEME:

| | |
|---|---|
| ($\rho$ =) m / V or 4.2 / 5.0 × 10⁻⁴ ;<br>8400 (kg / m³) ; | **2** |

**3** **(a)** Fig. 3.1 shows a piece of graphite with an irregular shape.



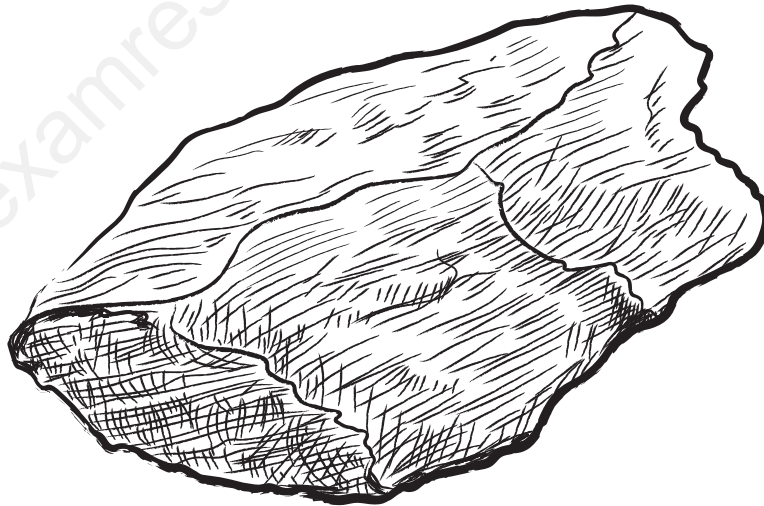**Fig. 3.1**

**(ii)** The piece of graphite has a mass of 33 g and a volume of 15 cm$^3$.

Calculate the density of the piece of graphite.

density = ............................................. g/cm$^3$ [2]

# MARK SCHEME:

| | |
|---|---|
| (density =) m / V OR 33 / 15 ;<br>2.2 (g / cm$^3$) ; | **2** |

**4** The density of liquid lead is $10.6\,g/cm^3$.

A sample of liquid lead has a mass of $37.1\,g$.

Calculate the volume of the sample of liquid lead.

volume = .................................. $cm^3$  [2]

# MARK SCHEME:

| | |
|---|---|
| $d = m / v$ **or** $v = m / d$ **or** $v = 37.1 / 10.6$ ;<br>$= 3.5\,(\text{cm}^3)$ ; | **2** |

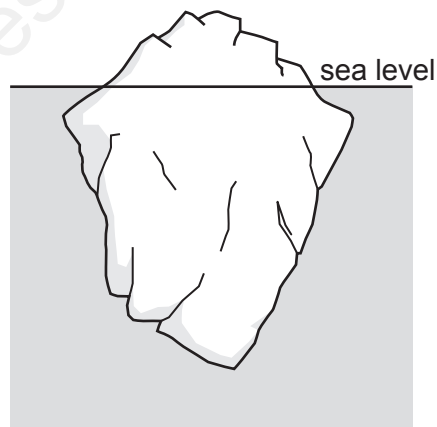**5** Fig. 3.1 shows an iceberg floating in the sea.



**Fig. 3.1**

**(a)** The density of the iceberg is $920 \, \text{kg/m}^3$ and the volume of the iceberg is $2 \times 10^5 \, \text{m}^3$.

Calculate the mass of the iceberg.

mass = .................................................... kg  [2]

# MARK SCHEME:

| Question | Answer | Marks |
|---|---|---|
| (a) | (m =) $\rho V / 920 \times 2 \times 10^5$ ; <br> (m =) $1.84 \times 10^8$ (kg) ; | **2** |