Mark schemes

Q1.

(a) 0.0 to 10.0 cm^3

1

(b) the measured volume would be larger

1

(c) 0.4 (cm^3)

1

(d) the results are repeatable

1

(e) subtract 0.02 from the measurement

1

(f)

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

or

$$\rho = \frac{m}{V}$$

1

(g)

$$22 = \frac{m}{0.3}$$

1

$m = 22 \times 0.3$

1

$m = 6.6$ (g)

1

[9]

Q2.

(a) **Level 3**: The method would lead to the production of a valid outcome. All key steps are identified and logically sequenced.

5–6

Level 2: The method would not necessarily lead to a valid outcome. Most steps are identified, but the method is not fully logically sequenced.

3–4

Level 1: The method would not lead to a valid outcome. Some relevant steps are identified, but links are not made clear.

1–2

No relevant content

0

Indicative content:

- measure mass using a balance / scales
- part fill a measuring cylinder with water and measure initial volume
- place rock in water and measure final volume
- volume of rock = final volume − initial volume
- fill a displacement / eureka can with water level with spout
- place rock in water and collect displaced water
- measuring cylinder used to determine volume of displaced water
- volume of rock = volume of displaced water
- use mass and volume to calculate density
- use of: density = $\frac{\text{mass}}{\text{volume}}$

(b) maximum density = 2.65 (g/cm^3)

both required

minimum density = 2.45 (g/cm^3)

1

(c) chalk or flint

1

(d) a mean can be calculated

1

which reduces the effect of random errors

allow anomalies can be identified / removed

1

[10]