Name of the Student:_____
Max. Marks : 24 Marks **Time : 24 Minutes**

Mark Schemes

Q1.

(a) polarity of the potential difference doesn't change

allow direction of the potential difference doesn't change

1

(b) $E = QV$

1

(c) $5010 = Q \times 12$

1

$$Q = \frac{5010}{12}$$

1

$Q = 417.5$ (C)

allow 418 (C)

1

(d) $5010 = 0.015 \times L$

1

$$L = \frac{5010}{0.015}$$

1

$L = 334\,000$ (J/kg)

1

(e) **Level 3:** Relevant points (reasons / causes) are identified, given in detail and logically linked to form a clear account.

5-6

Level 2: Relevant points (reasons / causes) are identified, and there are attempts at logical linking. The resulting account is not fully clear.

3-4

Level 1: Points are identified and stated simply, but their relevance is not clear and there is no attempt at logical linking.

1-2

No relevant content

0

Indicative content

- particles in a solid are in a regular pattern

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- particles in a liquid are in a random arrangement

- particles in a solid are vibrating about fixed positions
- particles in a liquid are moving freely

- as the ice changes to water the temperature remains constant
- because as the ice changes to water the potential energy of the particles increases

- as the water warms the particles move faster
- so the kinetic energy of the particles increases

- internal energy is the total kinetic and potential energy of all the particles

ignore any references to density of ice vs liquid water
ignore any references to spacing of particles

[14]

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

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(d) a mean can be calculated

1

which reduces the effect of random errors

allow anomalies can be identified / removed

1

[10]

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