

Name of the Student: _____

Max. Marks : 24 Marks

Time : 24 Minutes

Mark Schemes

Q1.

- (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 plan 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 of oil using the top pan balance
- measure start temperature of oil using the thermometer
- place beaker of oil on heater
- switch on heater to heat oil
- measure final temperature of oil using the thermometer
- measure energy transferred using joulemeter
- calculate increase in temperature ($\Delta\theta$)
- use the equation $E = mc\Delta\theta$ to determine c

- (b) burns / scalds

allow cuts from broken glass

ignore the heater / oil is hot

1

- (c) power = $\frac{\text{energy transferred}}{\text{time}}$

or

$$P = \frac{E}{t}$$

1

- (d) $50 = \frac{4750}{t}$

or

$$4750 = 50 \times t$$

1

$$t = \frac{4750}{50}$$

1

$$t = 95 \text{ (s)}$$

1

(e) thermistor

1

(f) 250 (Ω)

allow an answer in the range 240 (Ω) to 260 (Ω)

allow 1 mark for temperature = 160 ($^{\circ}\text{C}$)

2

(g) the water will recover its original properties if the steam is cooled

1

[15]

Q2.

(a) swap the blue wire and the green and yellow wire

allow connect the blue wire to the neutral pin and the yellow and green wire to the earth pin.

allow swap the earth and neutral wires

ignore the earth wire and neutral wire are wrongly connected

1

(b) 230 (V)

1

50 (Hz)

1

(c) 0 (V)

1

(d)



1

(e) the person could get an electric shock

allow so the person could be electrocuted

1

because there is a current in the person

allow because the person provides a connection (from the washing machine) to earth

allow because there is a potential difference across the person

1

(f) the charge flows through the earth wire (instead of the person)

1

because the resistance of the earth wire is much less than that of a person

allow so the case does not become live

allow so the fuse will break / melt / blow