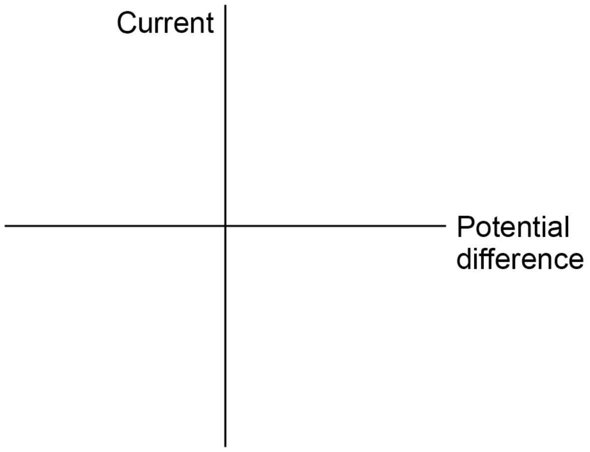
0 6 A student built a circuit using filament lamps.

0 6 . 1 Sketch a current potential difference graph for a filament lamp on **Figure 9**

[2 marks]

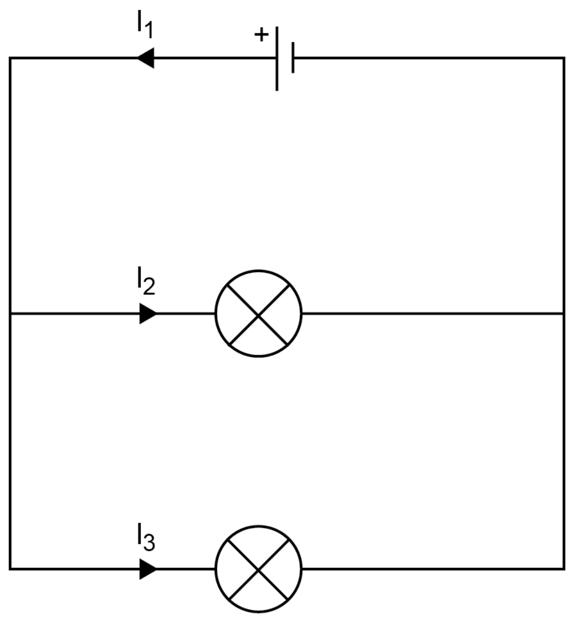
Figure 9



Do not write outside the box

Figure 10 shows the circuit with two identical filament lamps.

Figure 10



0 6 . 2 Compare the currents I_1, I_2 and I_3

[2 marks]

____

____

____

Question 6 continues on the next page

Do not write outside the box

0 6 . 3 Calculate the charge that flows through the cell in 1 minute.

Each filament lamp has a power of 3 W and a resistance of 12 Ω

Write any equations that you use.

Give the unit.

[6 marks]

Charge = ____________________

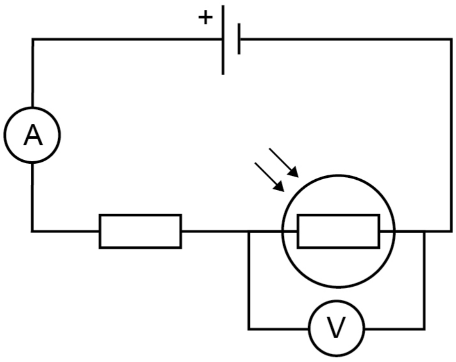
Unit = ____________________

Do not write outside the box

0 6 . 4 The student builds a different circuit.

Figure 11 shows the circuit.

Figure 11



Explain how the readings on both meters change when the environmental conditions change.

[6 marks]

16

END OF QUESTIONS

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.1	a curve in the first and third quadrants only, passing through origin decreasing gradient		1 1	AO1 6.2.1.4
06.2	any **two** from: • $I_1 = I_2 + I_3$ • $I_2 = I_3$ • $I_1 = 2I_2$ • $I_1 = 2I_3$	allow **1** mark for each correct description given in words	2	AO2 6.2.2
06.3	$3 = I^2 \times 12$ $I = \sqrt{\left(\frac{3}{12}\right)}$ $I = 0.5$ (A) $Q = 0.5 \times 60 = 30$ $Q_{total} = 60$ **or** $3 = I^2 \times 12$ (1) $I = \sqrt{\left(\frac{3}{12}\right)}$ (1) $I = 0.5$ (A) (1) $I_{total} = 1.0$ (A) (1) $Q = 1.0 \times 60 = 60$ (1) coulombs **or** C	an answer of 60 scores **5** calculation marks allow Q = their calculated I × 60 allow an answer that is consistent with their calculated value of I allow I_{total} = their I × 2 allow an answer that is consistent with their calculated value of I	1 1 1 1 1 1	AO2 6.2.4.1 6.2.4.2 AO1

Question	Answers	Mark	AO / Spec. Ref.
06.4	**Level 3:** Relevant points (reasons / causes) are identified, given in detail and logically linked to form a clear account.	5–6	AO3
	Level 2: Relevant points (reasons / causes) are identified, and there are attempts at logically linking. The resulting account is not fully clear.	3–4	AO2
	Level 1: Points are identified and stated simply, but their relevance is not clear and there is no attempt at logical linking.	1–2	AO2
	No relevant content	0	
	Indicative content • resistance of LDR changes when light intensity changes • when light intensity increase resistance of LDR decreases • overall resistance of circuit decreases • potential difference across total resistance remains unchanged • current in ammeter increases • potential difference across fixed resistor increases • potential difference across LDR decreases • reading on the voltmeter decreases • potential difference is shared between the components in series • the lower the resistance of the LDR the smaller the share of the potential difference • reading on the voltmeter decreases		6.2.1.1 6.2.1.4
Total		**16**	