Cambridge Assessment International Education

Cambridge IGCSE™

2: Electricity 1 – Topic questions

Paper 3

The questions in this document have been compiled from a number of past papers, as indicated in the table below.

Use these questions to formatively assess your learners' understanding of this topic.

Question	Year	Series	Paper number
10	2016	June	31
11	2016	March	32
8	2016	November	31

The mark scheme for each question is provided at the end of the document.

You can find the complete question papers and the complete mark schemes (with additional notes where available) on the School Support Hub at www.cambridgeinternational.org/support

10 A student makes the circuit shown in Fig. 10.1 using a 12V battery.

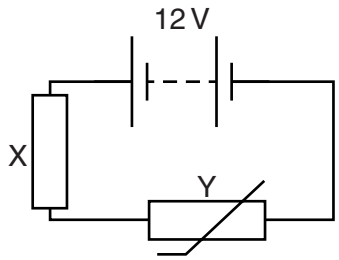

Fig. 10.1

(a) Complete the sentences about the circuit. Use words from the box.

fixed resistor	lamp	light-dependent resistor	parallel	series	thermistor

(i) Components X and Y are connected in .....[1]

(ii) The component Y is a .....[1]

(b) Fig. 10.2 shows how the resistance of Y varies with temperature.

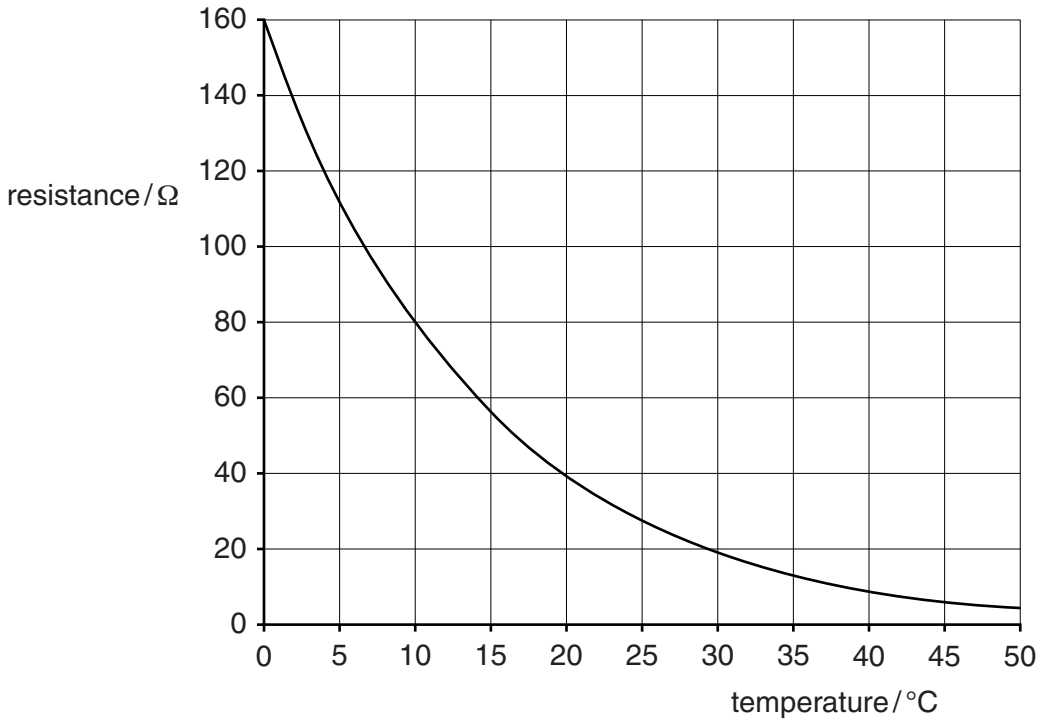

Fig. 10.2

(i) Describe how the resistance of Y varies with temperature.

.....

.....

.....[2]

(ii) The temperature of Y is 10 °C. The resistance of X is 20 Ω.

Calculate the combined resistance of Y and X.

resistance = ... Ω [3]

(iii) Calculate the current in the circuit.

current = ... A [3]

[Total: 10]

11 **(a)** A student changes the current in a filament lamp. She measures the current and the potential difference (p.d.) across the lamp.

Fig. 11.1 is an incomplete circuit diagram.

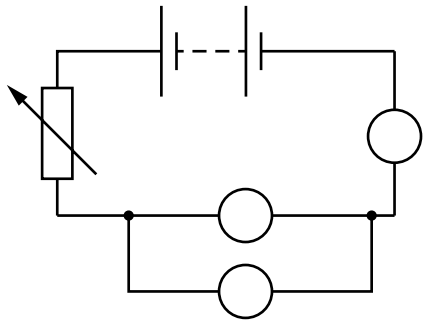

Fig. 11.1

(i) On Fig. 11.1, complete the unfinished circuit symbols. [3]

(ii) One pair of readings for the lamp is shown in the table.

p.d./V	current/A
6.0	1.2

Calculate the resistance of the filament in the lamp for these readings.

resistance of filament = ...Ω [3]

(iii) After many hours of use, the filament wire in a lamp becomes thinner.

State the effect, if any, on the resistance of the lamp.

.....[1]

(b)(i) Complete the circuit in Fig. 11.2 to show a battery connected to three lamps arranged in parallel.

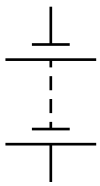

Fig. 11.2

[2]

(ii) Describe **two** advantages of connecting these lamps in parallel with the battery.

.....

.....[2]

[Total: 11]

8 A student measures the resistance of a sample of wire.

She plans to use the circuit shown in Fig. 8.1.

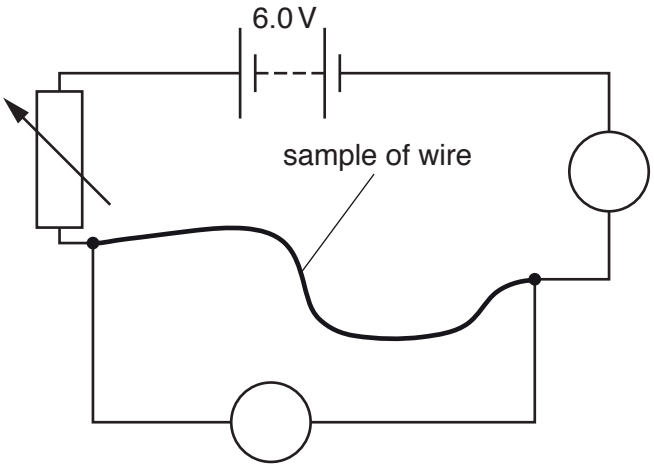

Fig. 8.1

Two circuit symbols are incomplete.

(a) Complete the symbols for the two meters on Fig. 8.1. [2]

(b) The current in the wire is 0.20 A. The potential difference across the wire is 6.0 V.

Calculate the resistance of the wire.

resistance = ... Ω [3]

(c) The student tests a thinner wire. It is the same length as the wire in **(b)** and is made of the same material. The potential difference across the wire is 6.0 V.

Explain how the current in this thinner wire compares with that in the first wire.

.....

.....

.....[2]

[Total: 7]

Question	Answer	Mark
10 (a) (i)	series	B1
10 (a) (ii)	thermistor	B1
10 (b) (i)	resistance decreases as temp increases B1 at decreasing rate OR not proportional OR not linear	B1 B1
10 (b) (ii)	resistance of Y = 80 Ω Rt = R1 + R2 in any form 100(Ω)	C1 C1 A1
10 (b) (iii)	V = *I R* in any form 12 ÷ 100 **OR** 12 ÷ candidates **(b)(ii)** 0.12 (A) **OR** ECF from **(b)(ii)**	C1 C1 A1
		Total: 10
11 (a) (i)	ammeter correct symbol in series with lamp voltmeter correct symbol in parallel with lamp lamp correct symbol	B1 B1 B1
11 (a) (ii)	R = V / *I* in any form 6 ÷ 1.2 5 (Ω)	C1 C1 A1
11 (a) (iii)	(resistance) increases	B1
11 (b) (i)	3 lamp symbols drawn (lamps connected) in parallel with battery	B1 B1
11 (b) (ii)	any two from: • lamps all have 6 V or full voltage (across them) • if one (lamp) breaks, others continue to operate / little / no effect on others • lamps can be switched on and off independently	B2
		Total: 11
8 (a)	A in circle in series with wire V in circle in parallel with wire	B1 B1
8 (b)	V = I R **OR** (R =) *V* / I 6.0 / 0.2 30 (Ω)	C1 C1 A1
8 (c)	current is smaller (in 2nd wire) (as) resistance is greater (in 2nd wire)	B1 B1
		Total: 7

Notes about the mark scheme are available separately.