Charge, current and resistance

Physics Paper 1 calculations | AQA Combined Science 8464 and AQA GCSE Physics 8463 | 13 questions, 37 marks

GCSE science calculations

Scan for the solutions

Equations for this topic (cover this box to practise recalling them)

- charge flow = current × time learn this one
- potential difference = current × resistance learn this one
- total resistance = resistance 1 + resistance 2 learn this one

Name: _____ **Date:** _____ **Score:** _____ **/ 37**

1 A current of 2 A flows through a lamp for 30 s.

Calculate the charge that flows through the lamp.

(2 marks)

Answer _____

2 A current of 0.5 A flows through a resistor of resistance 24 Ω.

Calculate the potential difference across the resistor.

(2 marks)

Answer _____

3 Ruby connects a 10 Ω resistor and a 15 Ω resistor in series.

Calculate the total resistance of the two resistors.

(1 mark)

Answer _____

4 A current of 250 mA flows through a buzzer for 40 s.

Calculate the charge that flows through the buzzer.

(3 marks)

Answer _____

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5 Daniel charges his phone overnight. The charger supplies a steady current of 1.5 A for 2 hours.

Calculate the charge that flows into the phone.

(3 marks)

Answer _____

6 An LED circuit has a 450 Ω resistor. A current of 20 mA flows through the resistor.

Calculate the potential difference across the resistor.

(2 marks)

Answer _____

7 An electric fan heater is connected to the 230 V mains supply. The resistance of its heating element is 46 Ω.

Calculate the current in the heating element.

(3 marks)

Answer _____

8 In a Year 10 practical, Sofia measures a potential difference of 6.0 V across a resistor. The ammeter reads 40 mA.

Calculate the resistance of the resistor.

(3 marks)

Answer _____

9 A current of 0.8 A flows through an electric motor in a toy car. A total charge of 1200 C flows through the motor.

Calculate how long the motor was running. Give your answer in minutes.

(3 marks)

Answer _____

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10 Ethan builds a series circuit with a 9.0 V battery, a 220 Ω resistor and a lamp. The current in the circuit is 30 mA.

Calculate the resistance of the lamp. Show your working.

(4 marks)

Answer _____

11 A potential difference of 4.5 V is applied across a 30 Ω resistor for 3 minutes.

Calculate the charge that flows through the resistor. Show your working.

(4 marks)

Answer _____

12 A 470 Ω resistor and a 330 Ω resistor are connected in series with a 9.0 V battery.

a. Calculate the total resistance of the circuit.

b. Calculate the current in the circuit. Give your answer in mA to 2 significant figures.

c. The circuit is switched on for 10 minutes. Calculate the charge that flows. Give your answer to 2 significant figures. Show your working.

(5 marks)

Answer _____

13 A lamp and a resistor are connected in series to a 12 V battery. A voltmeter across the resistor reads 4.5 V. The current in the circuit is 0.15 A.

Calculate the resistance of the resistor.

(2 marks)

Answer _____

End of questions | Total 37 marks

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