

Circuit rules, power and mains safety

Physics grades 9-10 (GCSE · IGCSE · O Level · Class 9-10) · Test

Name: _____ Date: _____ Class: _____ Mark: ____ / 20

This test has 8 questions worth 20 marks in total. Use a calculator, show every step, and write units on your answers. You have 45 minutes.

Level: Physics grades 9-10 (GCSE · IGCSE · O Level · Class 9-10) · **Curriculum:** GCSE P2, HS-PS3-3

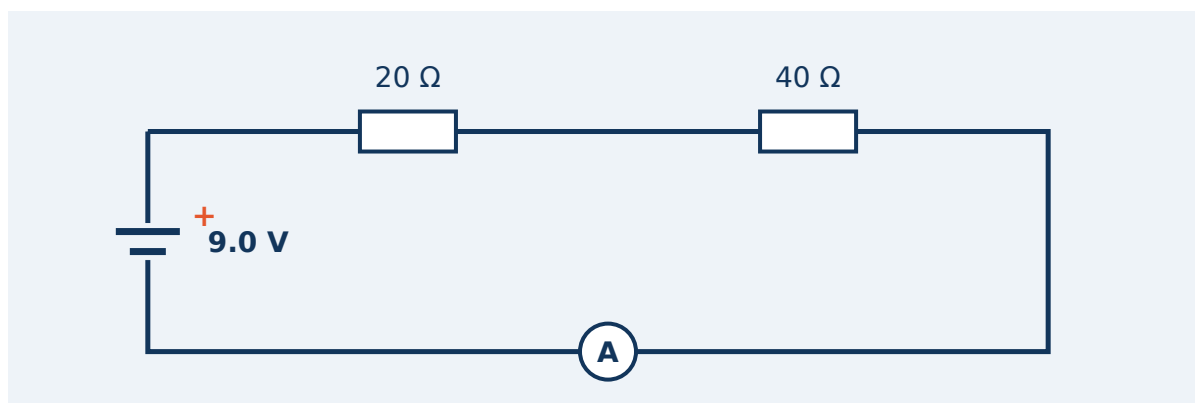
Time: 45 minutes · 8 questions · Total: 20 marks · Calculator allowed

Question 1 Series and parallel (2 marks)

State **two** differences between a series circuit and a parallel circuit.

Question 2 Series calculation (3 marks)

The circuit shows two resistors in series on a 9.0 V cell.



Test circuit: two resistors in series on a 9.0 V cell.

- Calculate the total resistance. (1 mark)
- Calculate the reading on the ammeter. (1 mark)
- Calculate the potential difference across the 40 Ω resistor. (1 mark)

Question 3 Parallel calculation (3 marks)

A 24 Ω resistor and an 8.0 Ω resistor are connected in parallel across a 12 V supply.

- Calculate the current in each resistor. (2 marks)
- Calculate the total current drawn from the supply. (1 mark)

Question 4 Hair dryer fuse (2 marks)

A hair dryer is rated 1.8 kW at 230 V. Fuses of 3 A, 5 A and 13 A are available.

- Calculate the current. (1 mark)
- Choose the correct fuse. (1 mark)

Question 5 Cost of an oven (3 marks)

An oven of power 1.5 kW is used for 2.5 hours. Electricity costs 28 p per kWh.

- Calculate the energy used in kWh. (1 mark)
- Calculate the cost in pounds. (2 marks)

Question 6 Role of the earth wire (3 marks)

Explain how the earth wire and the fuse together protect a user if a live wire touches the metal case of a toaster.

Question 7 Power in a resistor (2 marks)

A current of 3.0 A flows in a resistor of 8.0 Ω . Calculate the power transferred.

Question 8 Lamps in a house (2 marks)

Explain why adding more lamps in parallel does not dim the others, but adding more lamps in series does.