

2.1 Mains electricity

Name: _____ Class: _____ Date: _____

Total: 19 marks

Objective

Cover mains electricity (2.2–2.6): insulation and protection devices, heating in resistors, $P = IV$, $E = IVt$, a.c. and d.c. Original IGCSE-level practice.

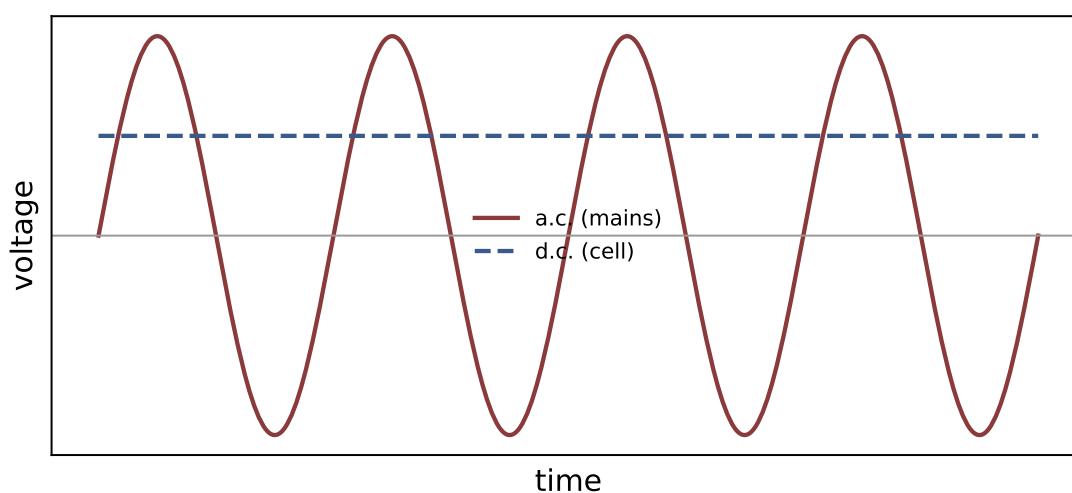
1 Key knowledge and worked examples

■ Choose the fuse from the current

Worked check. A 230 V hairdryer rated 920 W: $I = 920/230 = 4 \text{ A}$ – fit a 5 A fuse (the next standard rating above). A fuse rated below the operating current blows constantly; far above fails to protect.

■ Why appliances warm

Current in a resistor transfers electrical energy to thermal energy – useful in heaters and kettles, wasteful elsewhere. Insulation, double insulation, earthing, fuses and circuit breakers protect the device and the user.



2 Practice

2.1 State two differences between mains a.c. and battery d.c. [2]

2.2 Explain how a fuse protects a device. [2]

2.3 A 230 V lamp draws 0.5 A. Calculate its power. [2]

2.4 The lamp runs for 2 hours. Calculate the energy transferred in joules. [3]

2.5 Name the protection device that can be reset without replacement. [1]

3 Exam-style questions

3.1 Explain why a heater with a metal casing must be earthed, but one with a double-insulated plastic casing need not be. [3]

3.2 An electric kettle is rated 2.2 kW at 230 V. Calculate the current and choose a fuse from 3 A, 5 A, 13 A, justifying the choice. [4]

3.3 Explain why the same heater is cheaper to run for 30 minutes than for 1 hour, using $E = IVt$. [2]
