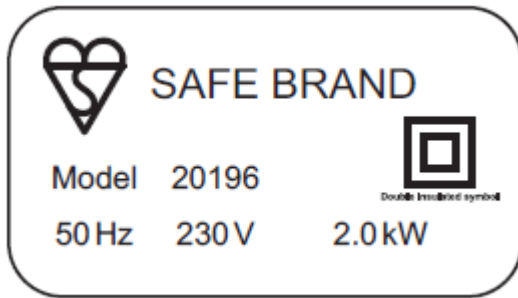


GCSE Physics B (Twenty First Century Science)
J259/02 Depth in physics (Foundation Tier)

Question Set 11

1 Kareem is researching a kettle to buy for his grandad.

(a) This is the label for one kettle he found on the Internet.



Kareem makes the following comment.

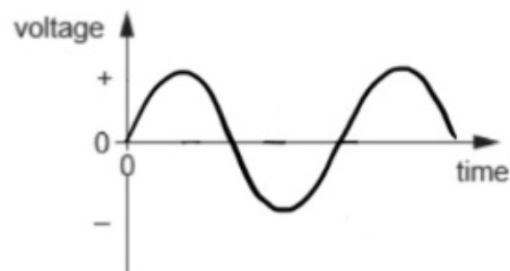
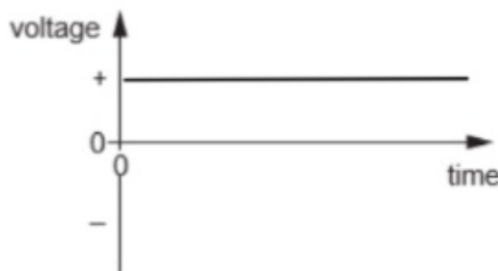
The domestic supply in the UK is alternating.
The power of this kettle is 2000 W.



(a) (i) What is the frequency and potential difference (voltage) of the domestic supply in the UK? [1]

$$f = 50\text{ Hz} \quad V = 230\text{ V}$$

(ii) On the axes, sketch a graph for a direct voltage and an alternating voltage.



(iii) The power of the kettle is 2000 W. [3]

How many joules of energy are transferred by the kettle in a time of 1 second?

(iii) The power of the kettle is 2000 W.

How many joules of energy are transferred by the kettle in a time of 1 second?

$$E = Pt = 2000 \times 1 = 2000\text{ J}$$

Energy = 2000 J [1]

(b) The table shows data on three kettles **A**, **B** and **C** found by Kareem.

Kettle	Power (W)	Lifetime of kettle (hours of use)	Total energy transferred (kWh)
A	1500	400	
B	2000	200	400
C	2500	100	250

(i) Calculate the total energy, in kilowatt hours (kWh), transferred by kettle **A** during its lifetime.

Use the equation: energy transferred = power × time

$$E = 1.5 \text{ kW} \times 400 = 600 \text{ kWh}$$

Total energy transferred = 600 kWh [3]

(ii) Which kettle, **A**, **B** or **C**, will take the longest time to boil **one** litre of water?

Give **one** reason for your answer.

A as lowest power [2]

(c) What is the name of the device used to change low-voltage to high-voltage at power stations?

Put a ring around the correct answer.

diode

National Grid

thermistor

transformer

[1]

Total Marks for Question Set 11: 11

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