Oxford Cambridge and RSA

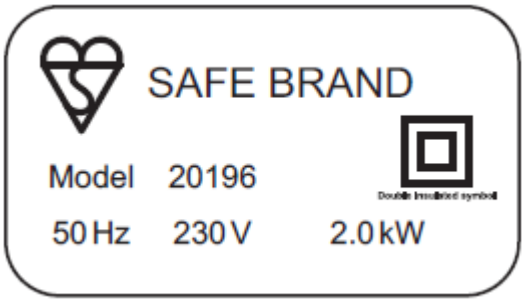
GCSE Physics B (Twenty First Century Science)

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.

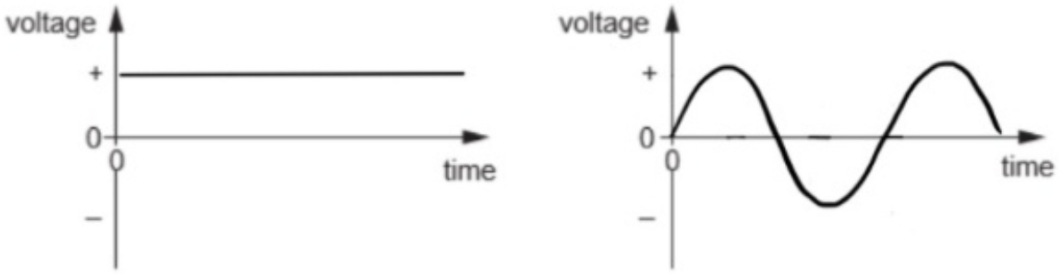


Kareem makes the following comment.

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

f = 50Hz V = 230V

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



[3]

(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?

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

E = Pt = 2000 × 1 = 2000 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