

GCSE Physics B (Twenty First Century Science)
J259/01 Breadth in Physics (Foundation Tier)

Question Set 31

1

Eve needs to buy a vacuum cleaner. She compares two vacuum cleaners. Vacuum cleaner **A** runs using mains electricity. It is connected to the mains using a cable.



Vacuum cleaner **B** does not have a cable. It runs from energy stored in a battery.



- (a) Both vacuum cleaners transfer energy from an energy store.
- (i) Name the form of stored energy that is used by wind turbines to generate mains electricity. [1]
Kinetic
- (ii) Name the form of stored energy in a battery. [1]
Chemical
- (b) Vacuum cleaner **B** runs out of battery after two hours. Describe what has happened to the energy which was stored in the battery. [2]
Energy is transferred by electricity
- (c) The table shows some information about the two vacuum cleaners.

Vacuum cleaner	A	B
Input power (W)	700	65
Potential difference (V)	230	11

Calculate the current in vacuum cleaner **B**.

Use the equation: current = power ÷ potential difference

Give your answer to **3** significant figures.

$$I = \frac{P}{V} = \frac{65}{11} = 5.91 \text{ A (3sf)}$$

Current = *5.91* A [3]

- (d) (i) Calculate the energy transferred by vacuum cleaner **A** when it is operated for 600 seconds.

$$E = Pt = 700 \times 600 \\ = 420000 \text{ J}$$

Energy transferred = 420000 J

[3]

- (ii) When both vacuum cleaners are operated for 600 seconds, vacuum cleaner **A** transfers more energy.

Explain why.

[2]

It has a higher power so more energy is used per second

Total Marks for Question Set 31: 12

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