

Perm + Include Magnetism, Magnetic Forces & Fields

Question Paper

Level	GCSE (9-1)
Subject	Combined Science: Trilogy - Physics
Exam Board	AQA
Topic	6.7 Magnetism and Electromagnetism
Sub-Topic	Perm + Include Magnetism, Magnetic Forces & Fields
Difficulty Level	Silver Level
Booklet	Question Paper

Time Allowed: 16 minutes

Score: /15

Percentage: /100

Grade Boundaries:

Q1. An electric current is a flow of electrical charge through a circuit.

- (a) Complete the sentence.

Use a word from the box.

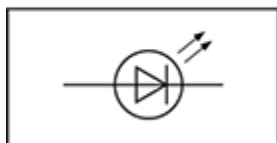
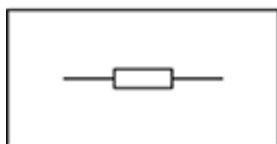
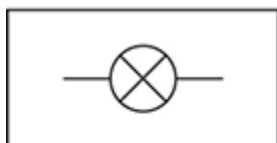
atoms	electrons	ions	molecules
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Metals are good conductors of electricity because electrical charge is transferred by delocalised

(1)

- (b) Draw **one** line from each symbol to the name of the component.

Standard symbol



Name of component

Battery

Lamp

LED





Resistor

Switch

(3)

- (c) The table below shows information about some electrical appliances.

Electrical appliance	Power in watts
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 Hairdryer	1500
 Kettle	2500
 Electric hob	3000
 Television	360

A student plugs all four of the appliances into one multi-way socket.

The mains electricity is 230 V.

The highest safe current in the socket is 30 A.

Explain why it is not safe to use all four appliances at the same time.

In your answer you should:

- calculate the total power needed
- use the equation

$$\text{current} = \text{power} \div \text{potential difference}$$

to calculate the total current needed.

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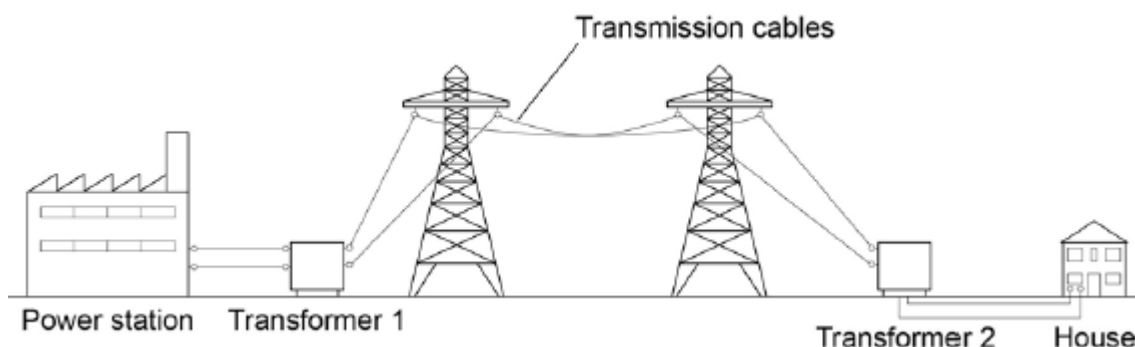
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(4)

- (d) The figure below shows how electrical power is transferred from power stations to consumers using the National Grid.



Transformer 1 is a step-up transformer.

Explain why step-up transformers are used in the National Grid.

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(3)

- (e) What is the purpose of Transformer 2?

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(1)

- (f) In a power station 900 MJ of thermal energy were released by burning natural gas.

Write down the equation that links efficiency, useful input energy transfer and useful output energy transfer.

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(1)

- (g) In a power station 900 MJ of thermal energy were released by burning natural gas.

Only 405 MJ was generated.

Calculate the efficiency of this energy transfer.

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Efficiency =

(2)

(Total 15 marks)