

# Practical Electricity

## Question Paper 1

<b>Level</b>	Edexcel
<b>Subject</b>	Physics
<b>Exam Board</b>	GCSE(9-1)
<b>Topic</b>	Electricity & Circuits
<b>Sub Topic</b>	Practical Electricity
<b>Booklet</b>	Question Paper 1

**Time Allowed:** 54 minutes

**Score:** /45

**Percentage:** /100

- 1 (a) A man monitors how much money he spends on electricity.  
He uses a device which calculates the cost of electrical energy used.  
He connects his 2.9 kW electric kettle to the 230 V mains supply.

(i) Calculate the current in the kettle element.

(3)

current = ..... A

- (ii) The device shows that in one week the total cost of the electrical energy used by the kettle is 97 p.  
1 kW h of electrical energy costs 17 p.

Calculate the length of time for which the kettle has been switched on during the week.

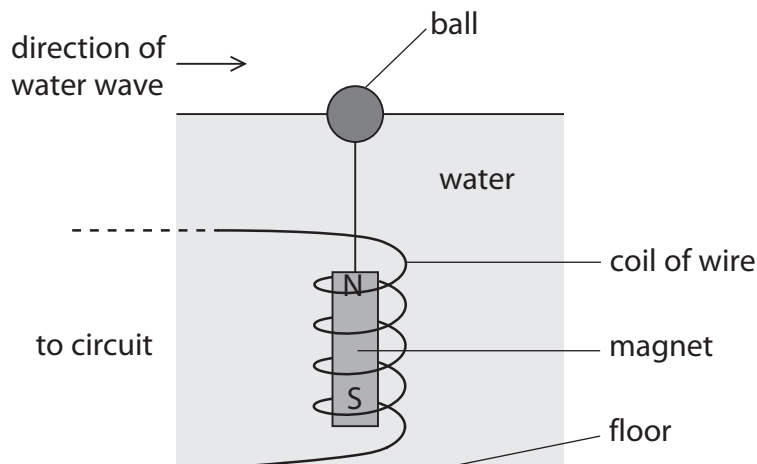
(3)

time = ..... hours

- \*(b) The diagram shows a model used to generate electricity from water waves in a tank.

A ball floats on the surface of the water in the tank.  
A coil of wire is fixed to the floor of the tank.  
A magnet is suspended from the ball inside the coil.

When a wave is sent along the surface of the water the ball moves up and down.





**Using electricity**

2 (a) Complete the sentence by putting a cross (☒) in the box next to your answer.

An electric current is the rate of flow of

(1)

- A** atoms
- B** charge
- C** voltage
- D** watts

(b) An electric kettle is connected to a mains voltage of 230 V.  
The current in the kettle is 12 A.

Calculate the power of the kettle.

(2)

power of the kettle = ..... W

(c) A television has a power of 400 W.  
The cost of 1 kW h of electrical energy is 15p.

Calculate the cost of using the television for 10 hours.

(3)

cost of using the television for 10 hours = ..... p



**Solar power**

3 (a) Complete the sentence by putting a cross (☒) in the box next to your answer.

The output power of a solar panel is the rate of transfer of

(1)

- A** current
- B** electrons
- C** energy
- D** voltage

(b) A solar panel generates direct current.

(i) Describe the difference between direct current and alternating current.

(2)

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(ii) The output from the solar panel is 60 V.

State why a transformer cannot be used to increase this voltage.

(1)

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(c) Homeowners are being encouraged to fit solar panels to the roofs of their homes.

Explain why using solar panels to generate electricity for the National Grid benefits the environment.

(2)

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- (d) A homeowner fits a solar panel to her roof.  
The cost of the solar panel is £4800.  
The solar panel supplies an average of 800 kW h of electrical energy to the National Grid each year.  
The homeowner is paid 40p for each kW h of energy supplied to the National Grid.

Calculate the payback time for the solar panels by selling energy to the National Grid.

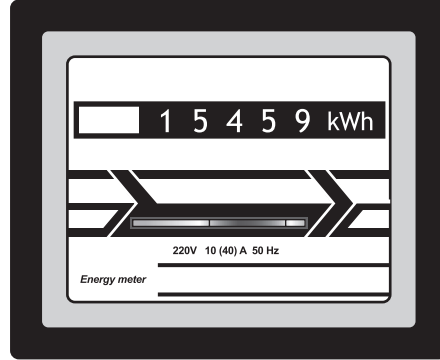
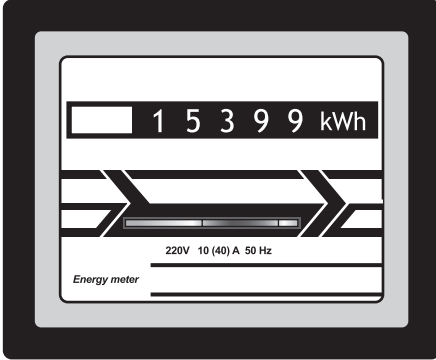
(3)

payback time = ..... years

**(Total for Question 3 = 9 marks)**

### Electrical power

- 4 (a) Electricity costs 20p for each kW h.  
The pictures show a domestic electricity meter at two different times.



- (i) Calculate the cost of the electricity used between the two readings.

(2)

cost = ..... p

- (ii) The time between these two readings is 15 hours.

Calculate the average power supplied.

(2)

average power = ..... kW



(b) Explain why step-up transformers are used in the transmission of electricity in the National Grid.

(2)

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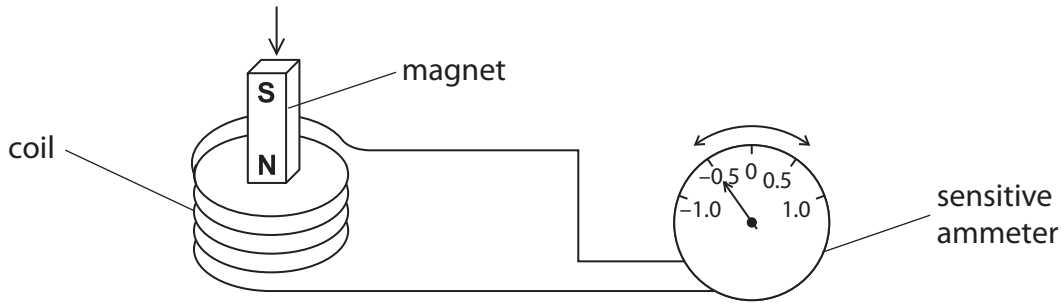
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\*(c) The diagram shows a magnet moving into a coil of wire.

The coil of wire is attached to a sensitive ammeter.



The moving magnet and the coil of wire are producing an electric current.

The size and direction of the current can be changed in a number of ways.

Describe changes that can be made to produce different currents and the effect of each change.

(6)

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**(Total for Question 6 = 12 marks)**