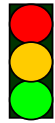# Physics
Standard Grade

Unit 2
Using Electricity
General & Credit Past Paper Questions

Record Sheet

General – Section	Question	Attempted	RED	AMBER	GREEN
Multiple Choice	1				
	2				
1.From the Wall Socket	3				
	4				
	5				
3. Resistance	6				
	7				
	8				
	9				
	10				
4. Useful Circuits	11				
	12				
	13				
	14				
	15				
5. Behind the Wall	16				
	17				
6. Movement from Electricity	18				

Credit – Section	Question	Attempted	RED	AMBER	GREEN
1.From the Wall Socket	19				
	20				
2. AC & DC Currents	21				
3. Resistance	22				
	23				
	24				
	25				
	26				
	27				
	28				
4. Useful Circuits	29				
	30				
	31				
5. Behind the Wall	32				
	33				
	34				
6. Movement from Electricity	35				
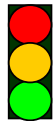
RED - I don't understand the question
        I NEED HELP!

AMBER - I understand most of the question
        I NEED TO REVISE A LITTLE MORE!

GREEN - I got the correct answer first time!!
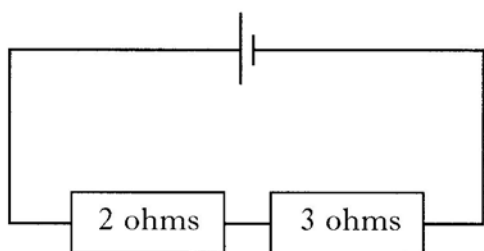   I UNDERSTAND THIS TOPIC

General Level
Answer questions in your Homework Jotter.
Show working for each question.

1.

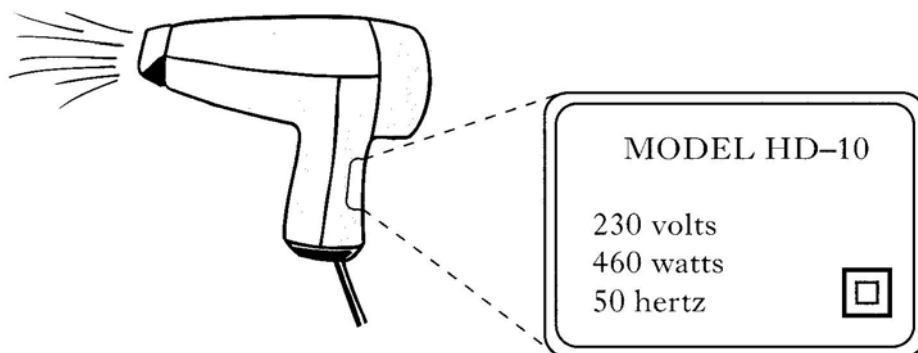In the circuit shown, the current in the 2 ohm resistor is 1 ampere.

What is the current taken from the battery?
A 0.4 ampere
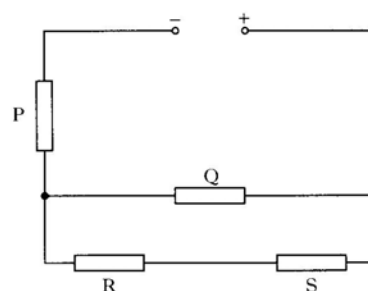B 1 ampere
C 2 amperes
D 3 amperes
E 5 amperes

2.

Four **identical** resistors, P,Q,R and S are connected as shown.

In which of the resistors is the current the same?
A P and Q only
B R and S only
C P, R and S only
D Q, R, and S only
E P,Q, R and S

3.

A hairdryer and its rating plate are shown below.

MODEL HD–10

230 volts
460 watts
50 hertz

(a)   (i)   How many wires are there in the flex of the hairdryer?

(ii) State the name **and** the colour of insulation of each wire in the flex.

(b)   Calculate the current in the hairdryer when it is operating.

(c)   (i)   State the correct fuse value for the plug of the hairdryer.

(ii) What is the purpose of the fuse in the plug?

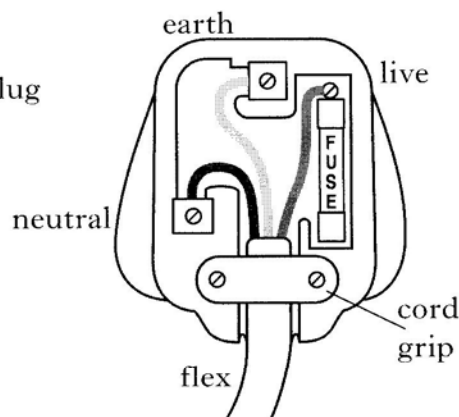The marks column values: 1, 1, 1, 1, 2, 2, 1, 1

Answer questions in your Homework Jotter.
Show working for each question.

| | KU | PS |

4.

The flex of a mains appliance has a 3-pin plug fitted as shown.

The flex contains three wires—live, neutral and earth.

(a) Circle the correct answer for each of the questions about the wires.

    (i)   The colour of the insulation around the live wire is

$$\left\{\begin{array}{l} \text{blue} \\ \text{brown} \\ \text{green/yellow} \end{array}\right\}.$$

KU: 1

    (ii) The colour of the insulation around the neutral wire is

$$\left\{\begin{array}{l} \text{blue} \\ \text{brown} \\ \text{green/yellow} \end{array}\right\}.$$

KU: 1

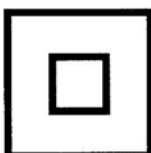   (iii) The $\left\{\begin{array}{l} \text{earth} \\ \text{live} \\ \text{neutral} \end{array}\right\}$ wire is a safety device.

KU: 1

(b) **Explain** why the flex must be held in place by the cord grip.

KU: 2

(c) Another appliance has only two wires in its flex. This appliance carries the following symbol.

    (i)   Name this symbol.

PS: 1

    (ii) Which wire is not needed in this flex?

KU: 1

General Level
Answer questions in your Homework Jotter.
Show working for each question.

5.　　　Appliances convert electrical energy into other forms of energy.

Appliance	Rating plate
Food processor	230 volts 50 hertz 400 watts
Hair dryer	230 volts 50 hertz □ 1200 watts
Kettle	230 volts 50 hertz 2200 watts
Lamp	230 volts 50 hertz □ 60 watts

(*a*)　State the **useful** energy output from the following appliances.

(i)　Lamp:　　electrical energy ⟶ .... energy

(ii)　Kettle:　electrical energy ⟶ .... energy

(*b*)　(i)　Name **one** appliance from the table which requires an earth wire.

(ii)　Circle **one** word or phrase in the passage below to make the statement correct.

The colouring of the insulation around the earth wire is

$\begin{Bmatrix} \text{blue} \\ \text{brown} \\ \text{green and yellow} \end{Bmatrix}$.

(iii)　Each appliance is fitted with either a 3 ampere or 13 ampere fuse. State the correct value of fuse for the following appliances.

(A)　Lamp:..

(B)　Hair dryer:...

1

1

1

1

1

1

Answer questions in your Homework Jotter.
Show working for each question.

KU	PS

6.

A CD player has a power rating of 0·3 watt and operates from a 6 volt power supply.

(a) Calculate the current in the CD player when it is operating.

(b) Power for the CD player can be supplied using batteries or the mains.

   (i) Draw the circuit symbol for a battery.

   (ii) For mains operation an adaptor reduces the voltage to 6 volts.

      (A) What is the declared value of the mains voltage?

      (B) What device in the adaptor reduces the voltage?

   (iii) State and explain the difference between current from the mains supply and current from a battery.

     Mains supply ....

     Battery supply ....

PS values: 2, 1, 1, 1, 2

Answer questions in your Homework Jotter.
Show working for each question.

	KU	PS

7.

The following information is taken from a leaflet comparing conventional lamps with energy saving lamps.

> A 20 watt energy saving lamp produces the same amount of light as a conventional 100 watt lamp.

> Energy saving lamps can last 10 times as long as conventional lamps.

> A conventional 100 watt lamp, used for an average of 4 hours per day, costs £1·00 per month to run.
> An energy saving lamp producing the same amount of light, and used for the same time, costs 20 pence per month to run.

(a) From the information given in the leaflet, state **one** advantage of using an energy saving lamp.   **1**

(b) A householder replaces one conventional 100 watt lamp with a 20 watt energy saving lamp. It is used for an average of 4 hours per day.
Calculate how much money is saved in running costs in one year.   **2**

(c) The leaflet claims that the energy saving lamp is more energy efficient. Use information given to explain what this means.   **2**

(d) The conventional lamp is a filament lamp.
The energy saving lamp is a discharge tube.

   (i) Where does the energy transformation take place in the conventional lamp?   **1**

   (ii) Where does the energy transformation take place in the energy saving lamp?   **1**

General Level
Answer questions in your Homework Jotter.
Show working for each question.

8.

A student sets up circuit 1 to calculate the resistance of resistor R.
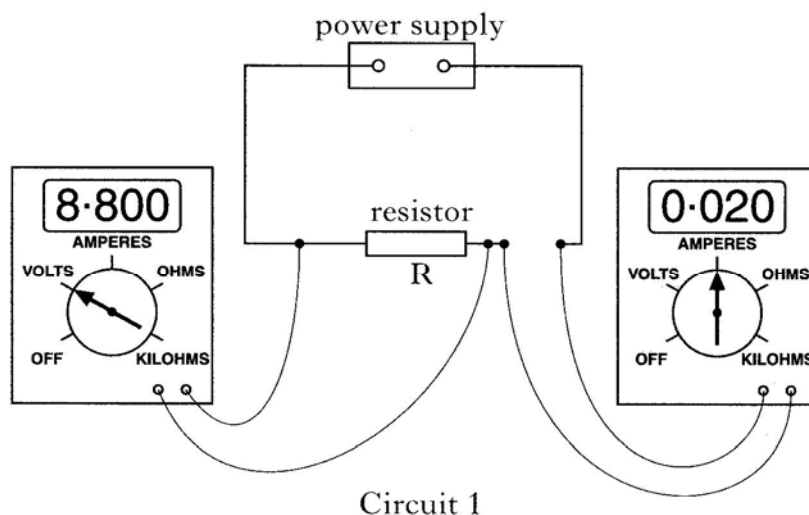
Circuit 1

(a) Calculate the resistance of resistor R using the meter readings.

(b) The student then sets up circuit 2 to measure the resistance of R directly.
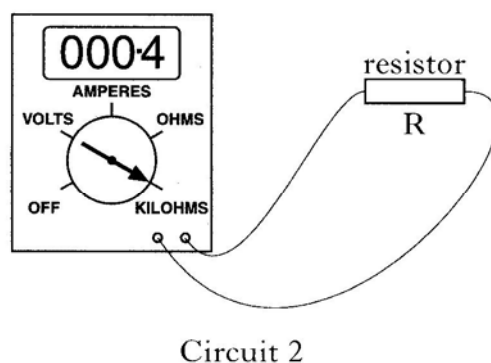
Circuit 2

Write down the resistance of R, **in ohms**, obtained from circuit 2.

(c) The value obtained for the resistance of R using circuit 1 is more accurate than the value obtained using circuit 2.

(i) Explain why circuit 1 gives a more accurate value for the resistance of R.

(ii) What change could be made in circuit 2 to give a more accurate value for the resistance of R?

2

1

1

1

General Level
Answer questions in your Homework Jotter.
Show working for each question.

9. A model car contains an electric motor, operated by a 6 volt battery. The speed of the motor is adjusted by a hand-held control. The hand-held control contains a variable resistor.

The circuit is shown below.
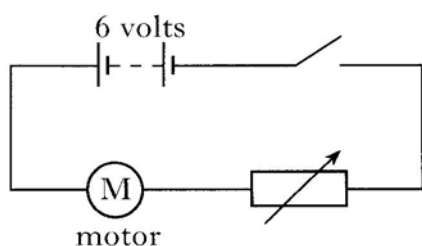
(a) When the resistance of the variable resistor is set to 8 ohms, the voltage across the variable resistor is 2 volts.

   (i) Calculate the current in the variable resistor.

   (ii) Calculate the voltage across the motor at this setting of the variable resistor.

(b) The resistance of the variable resistor is decreased.

   Explain what happens to the speed of the motor.

(c) Give one **other** use for a variable resistor.

10. There are several electrical hazards shown in the picture.
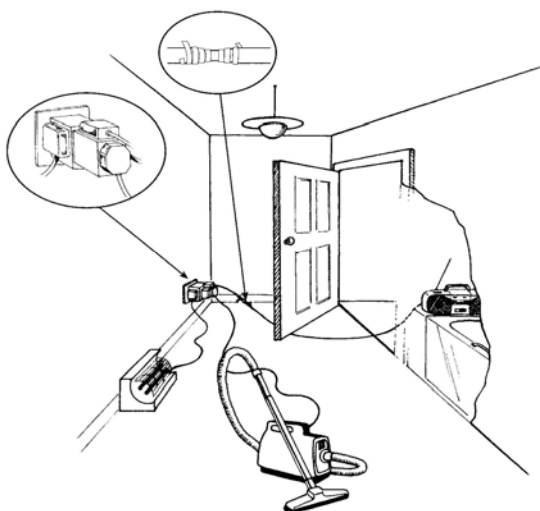
Identify **two** of the electrical hazards shown and for each explain why it is dangerous.

Hazard 1

   Give reason why it is dangerous.

Hazard 2

   Give reason why it is dangerous

Answer questions in your Homework Jotter.
Show working for each question.

	KU	PS

11. A camping light contains an 8 watt discharge tube, an 8 watt filament lamp and a 12 volt battery.
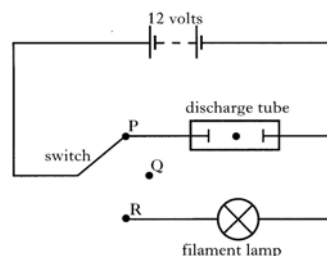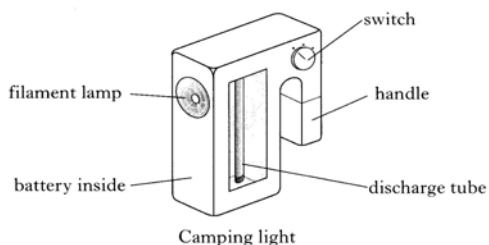
Camping light

The circuit diagram for the camping light is shown.

Write down the correct letter for each of the questions about the camping light

(a) The camping light is **off** when the switch is in position $\begin{pmatrix} P \\ Q \\ R \end{pmatrix}$

(b) The operating voltage of the filament lamp is $\begin{pmatrix} 6 \\ 8 \\ 12 \end{pmatrix}$ volts.

(c) The filament lamp and the discharge tube are constructed as shown below.

Filament lamp
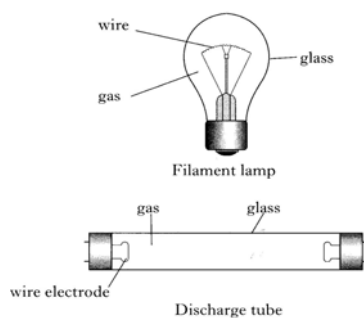
Discharge tube

(i) The useful energy transformation in the filament lamp takes place in the **{ glass   wire   gas }**

(ii) The useful energy transformation in the discharge tube takes place in the **{ glass   wire   gas}**

(iii) The electrical energy transformed each second by the discharge tube is **{ smaller than   the same as   greater than }** the electrical energy transformed each second by the filament lamp.

(iv) The heat energy produced each second by the discharge tube is **{ smaller than   the same as   greater than }** the heat energy produced each second by the filament lamp.

General Level
Answer questions in your Homework Jotter.
Show working for each question.

12.

(a) Three identical lamps are shown in Circuit 1 below.

12 volts
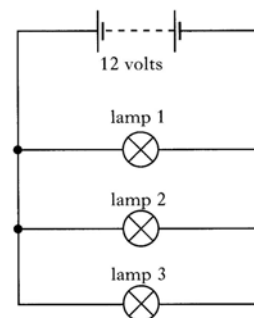
lamp 1

lamp 2

lamp 3

Circuit 1

(i) The battery has a voltage of 12 volts and supplies a current of 0·9 ampere to the circuit.

Complete the table below to show the current in each lamp and the voltage across each lamp.

	Lamp 1	Lamp 2	Lamp 3
Current (amperes)			
Voltage (volts)			

(ii) The three lamps and battery are now reconnected as shown in Circuit 2 below. The current from the battery is now 0·1 ampere.

12 volts
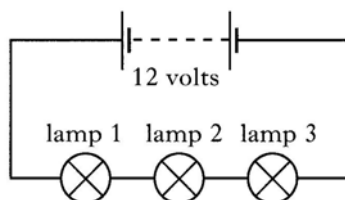
lamp 1   lamp 2   lamp 3

Circuit 2

Complete the table below to show the current in each lamp and the voltage across each lamp.

	Lamp 1	Lamp 2	Lamp 3
Current (amperes)			
Voltage (volts)			

(b) (i) Which of the circuits, Circuit 1 or Circuit 2, shown in (a) is similar to a household lighting circuit?

(ii) Name an electrical appliance used in the home that requires two or more switches to be used in series.

General Level
Answer questions in your Homework Jotter.
Show working for each question.

13.

A torch contains a battery, a lamp and a switch connected in series.

shiny surface
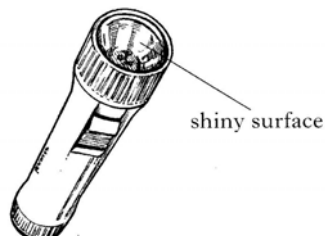
(a) Draw the circuit diagram for the torch, using the correct symbols.   **3**

(b) Complete the passage below, using words from the following list.

voltage   **current**   **charge**

When the torch is on, ... moves around the circuit.

This movement is called a..................................... .   **2**

(c) What is the **useful** energy transformation that takes place in the lamp when the torch is on?   **1**

(d) Why is the surface behind the lamp shiny?   **1**

14.

A continuity tester is used to test if a fuse has "blown". The continuity tester contains a lamp and a 1·5 volt battery.

lamp

P

fuse being tested — Q

battery inside
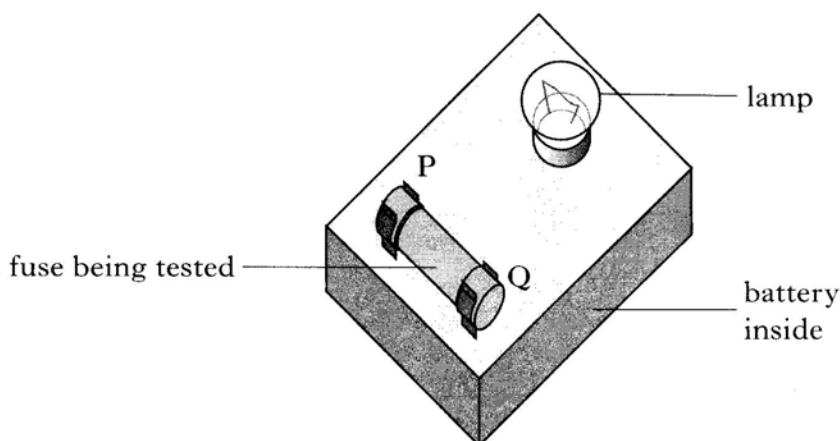
a) Draw the circuit diagram for the continuity tester.
On your diagram, include the fuse being tested between points P and Q .
You must use correct circuit symbols for all components.   **4**

b) Describe how the continuity tester is used to show that the fuse being tested is 'blown'.   **3**

General Level

Answer questions in your Homework Jotter.
Show working for each question.

15.

One of the spotlights on a stage does not work. A continuity tester is used to find the fault. The continuity tester contains a lamp and a 1·5 volt battery.

(a) Complete the circuit diagram for the continuity tester.
You must use the correct symbols for all components.

(b) Describe how you could check that the continuity tester is working properly.

(c) The continuity tester shows that the fault in the spotlight is an open circuit.
What is meant by an open circuit?

16.

A tennis court has four columns of floodlights.

Each column has two lamps. Each lamp has a power rating of 800 watts. The lamps are all connected in parallel with the mains supply.

(a) What is the value of the mains voltage?

(b) Give **two** advantages of connecting the lamps in parallel.

(c) (i) Calculate the total power delivered by the four columns of floodlights, in kilowatts.

General Level
Answer questions in your Homework Jotter.
Show working for each question.

16. (continued)

    (ii) (A) All the lamps are switched on for a tennis match. The match lasts for 3 hours.

            Calculate how many kilowatt-hours of electrical energy are used during this match.   **1**

      (B) The cost of 1 kilowatt-hour of electrical energy is 5 pence.   **2**

            Calculate the cost of the energy used for the lighting during this match.

(d) A fuse is included in the floodlight circuit to protect the wiring.

    Name **one** other device that could be used instead of a fuse.   **1**

17.

A two-speed hot air blower is used in a factory. The blower operates from a 110 volt supply. The blower contains a heater, and a fan attached to a motor. The blower is switched on by closing switch S_1.
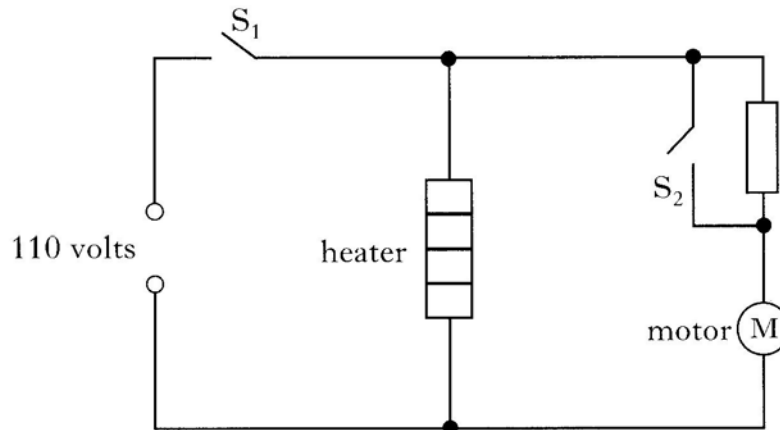
(a) What is the voltage across the heater when the blower is operating?   **1**

(b) Explain why switch S_2 should now be closed for the blower to operate at high speed.   **2**

(c) When operated at high speed, the blower is rated at 2000 watts. The blower is operated at high speed for 8 hours.

    (i) Calculate the number of kilowatt-hours of energy it uses in this time.   **2**

    (ii) Electricity costs 9 pence per kilowatt-hour.
         Calculate the cost of operating the blower for 8 hours.   **2**

Answer questions in your Homework Jotter.
Show working for each question.

	KU	PS

18.

A food mixer is used to prepare food.

(a) The double insulation symbol is displayed on the food mixer.

  (i) Draw the double insulation symbol. — **1**

  (ii) Which wire is **not** needed in the flex of the food mixer? — **1**

(b) The diagram below shows the main parts of the electric motor used in the food mixer.

A   C

B ....   D

Label the diagram using the parts of the motor listed below.

Field coil (magnet)   Brush   Rotating coil   Commutator
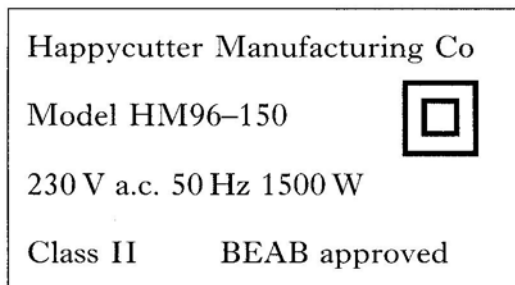
2

Credit Level
Answer questions in your Homework Jotter.
Show working for each question.

19.

A lawnmower has a label which gives the following information.

> Happycutter Manufacturing Co
>
> Model HM96–150   ☐
>
> 230 V a.c. 50 Hz 1500 W
>
> Class II   BEAB approved

(a)   (i)   State why this lawnmower has only two wires in the flex.

   (ii)   State the colours of the insulation on the two wires in the flex.

   (iii)   State the value of the fuse that should be fitted in the plug of this lawnmower.

(b)   Care must be taken to make sure that the lawnmower does not cut its own flex.   When this happens, there is a current path from the damaged flex, through the metal handle and the person using the lawnmower, to earth.

A dummy is used to investigate the safety of this lawnmower.   In one test, the resistance of the current path through the dummy is $5000\,\Omega$. This is approximately the same resistance as the current path when the lawnmower is used by a person.
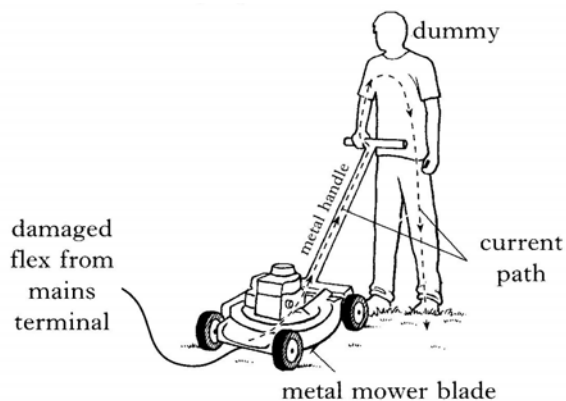
   (i)   Show by calculation that the current which passes through the dummy is 46 mA.

   (ii)   Explain why, in a situation like this, the fuse in the plug **would not** protect a person using the lawnmower.

   (iii)   What is the purpose of the fuse in the plug?

   (iv)   Water is now sprayed on the dummy and the investigation repeated.   State and explain the effect that this has on the current through the dummy.

Credit Level
Answer questions in your Homework Jotter.
Show working for each question.

20.

A mains vacuum cleaner contains a motor that takes 3·0 s to reach full speed after being switched on. The graph shows how the current in the motor varies from the time the motor is switched on.
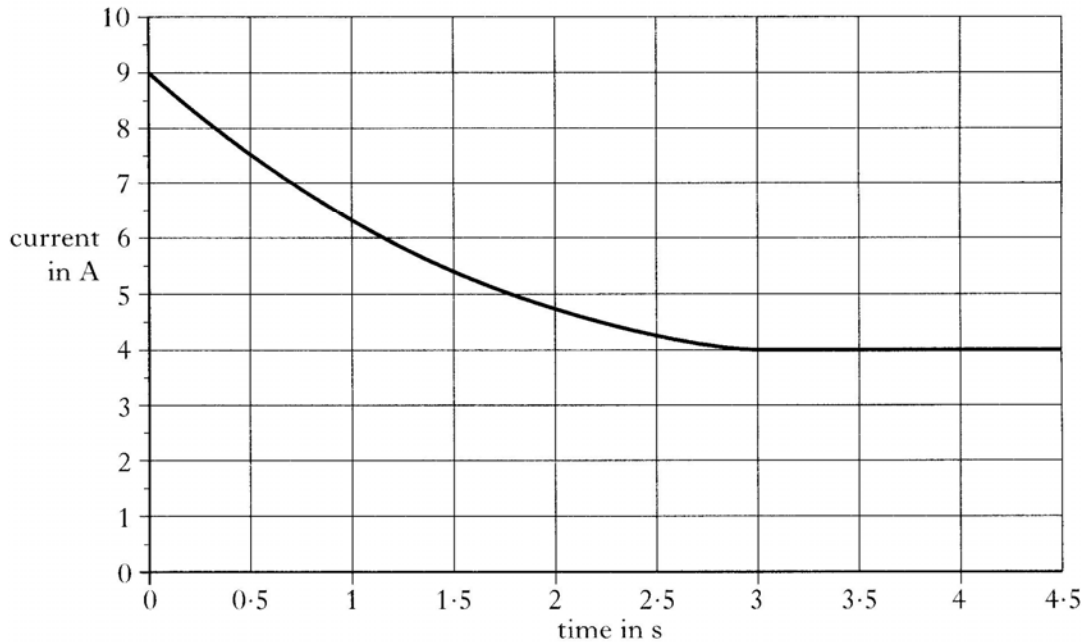
(a) (i) State the current when the motor has reached full speed.   1

    (ii) Calculate the power of the motor when it has reached full speed.   3

(b) The vacuum cleaner is connected to the mains supply by a flex fitted with a fused plug.

    (i) All the fuses shown are available.   1

3 ampere	5 ampere
10 ampere	13 ampere

       Which one of these fuses is **most** suitable for fitting in the plug?

    (ii) State the purpose of the fuse fitted in the plug.   1

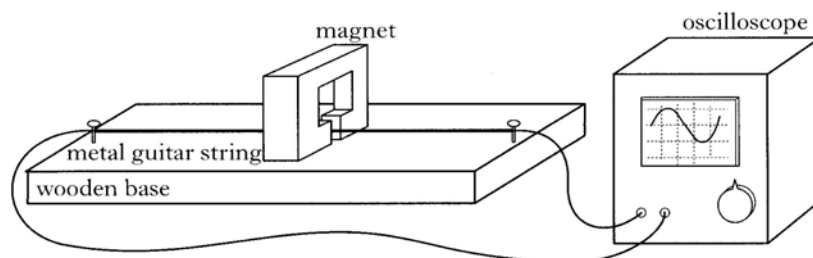   (iii) Explain why the fuse must be connected in the live wire.   1

Credit Level
Answer questions in your Homework Jotter.
Show working for each question.

21.

A metal guitar string, fixed to a wooden base, is connected to an oscilloscope. A magnet is placed so that the string is between the poles of the magnet, as shown.

When the string is plucked, a sound is produced and a voltage is induced in the string. The induced voltage is displayed on the screen of the oscilloscope.

(a) (i) Why is a voltage induced when the string is plucked?

1

  (ii) State one change that can be made so that a larger voltage is induced.

1

(b) The oscilloscope gain setting and trace are shown.

Calculate the peak voltage.

2
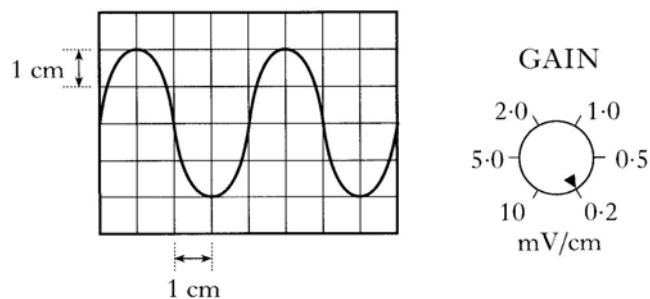
(c) A different metal string is used to produce a louder sound of higher frequency. No other changes are made to the equipment.

Draw a possible new trace on a grid in your jotter.

2

Credit Level
Answer questions in your Homework Jotter.
Show working for each question.

22.

A floodlight is fitted with a 230 V mains filament lamp. The filament takes 0·5 s to reach its operating temperature.

The graph shows how the resistance of the filament varies after being switched on.

(a) (i) What is the value of the resistance of the lamp when it is operating normally?
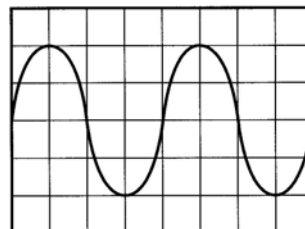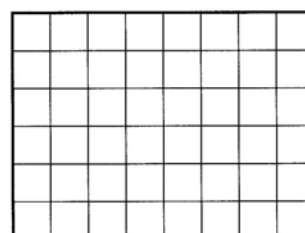
     1

(ii) Calculate the current in the lamp when it is operating normally.

     2

(iii) The floodlight could have been fitted with a lamp with a power rating of 150 W or 300 W or 500 W.

Show by calculation which lamp **is** fitted in the floodlight.

     3

(b) The lamp filament is most likely to "blow" or fail during the first 0·5 s after switch-on.

Using information from the graph, explain why this happens.

     2

23.

A mobile phone has a power of 75 mW and operates using a 3 V battery.

(a) Calculate the current taken from the battery when the mobile phone is being used.

     2

(b) Which of the following fuses should be connected in series with the battery of the mobile phone?

    20 mA   **100 mA**   **2 A**   **3 A**

     1

Credit Level
Answer questions in your Homework Jotter.
Show working for each question.

24.

A 2·5 V, 100 mA lamp is operated at its correct power rating from a 12 V battery by using the circuit shown.

12 V battery

resistor

(a) A voltmeter and an ammeter included in the circuit show that the lamp is operating at its correct rating.

Enter the readings that are seen on the meters. Include the units for both readings.

2

(b) (i) Calculate the voltage across the resistor.

1

(ii) Calculate the resistance of the resistor.

2

25.

A student uses the circuit below in experiments to investigate how the voltage across different components varies when the current in the components is changed.

Power
+ supply –

A

Component
under test

V

(a) The student places component X in the circuit and carries out an experiment. The graph below shows how the voltage across component X varies with current.

Credit Level

Answer questions in your Homework Jotter.
Show working for each question.

25. (Continued)

(i) Calculate the resistance of component X when the current is 1·2 A.

(You must use an appropriate number of significant figures in your answer to this question.)

2

(ii) Using information from the graph, explain what happens to the resistance of component X as the current is increased.

Justify your answer by calculation or otherwise.

3

(b) The student replaces component X with component Y, repeats the experiment and obtains the following graph.
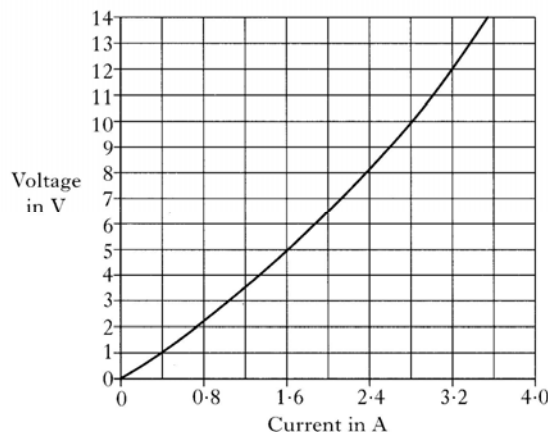
(i) The student concludes that the resistance of component Y is not constant. Why is the student correct in coming to this conclusion?

1

(ii) (A) From the graph, what is the current in component Y when the voltage across component Y is 12 V?

1

(B) Calculate the power dissipated in component Y when the voltage across it is 12 V.

2

Credit Level
Answer questions in your Homework Jotter.
Show working for each question.

26.

A home entertainment centre consists of four appliances. The table gives the power rating of each appliance.

Appliance	Power rating (W)
television	110
video recorder	22
satellite receiver	20
DVD player	18

To operate properly, each appliance must be connected to mains voltage. The appliances are connected to the mains using a multiway adaptor.

(a) (i) State the value of the operating voltage of the appliances.

(ii) The connections in the multiway adaptor are arranged to ensure that each appliance is connected to mains voltage.

(b) Calculate the current from the mains when all four appliances are operating at the power ratings shown in the table.

(You must use an appropriate number of significant figures in your answer to this question.)

(c) Calculate the resistance of the television when it is operating at the power rating stated in the table.

(d) The plug on the flex of the multiway adaptor contains a fuse.

What is the purpose of this fuse?

KU marks: (a)(ii) 1
PS marks: (a)(i) 1, (b) 3, (c) 2, (d) 1

Credit Level
Answer questions in your Homework Jotter.
Show working for each question.

27.

Two students are investigating voltage, current and resistance.

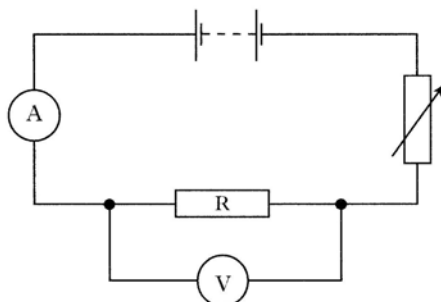(a) The first student builds the circuit shown.
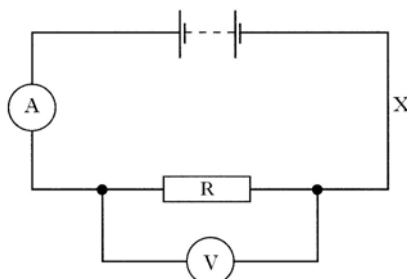
The ammeter displays a current of 0·10 A and the voltmeter displays a voltage of 3·0 V.

(i)   Calculate the resistance of R when the current is 0·10 A.

(ii) The student inserts another ammeter at position X.

What is the reading on this ammeter?

(b) The second student uses the **same** resistor in the circuit below.

This student obtains the following set of results.

Result number	Voltage across R (V)	Current through R (A)
1	6·0	0·20
2	7·5	0·25
3	9·0	0·30
4	10·0	0·35
5	12·0	0·40

(i)   Describe how these different values of voltage and current are obtained.

(ii) Explain which result should be retaken.

(c) What additional information about resistance does the second student's experiment give compared to the first student's experiment?

Credit Level

Answer questions in your Homework Jotter.
Show working for each question.

28.

Two groups of pupils are investigating the electrical properties of a lamp.

(a) Group 1 is given the following equipment:

ammeter; voltmeter; 12 V d.c. supply; lamp; connecting leads.

Complete the circuit diagram to show how this equipment is used to measure the current through, and the voltage across, the lamp.

————o 12 V d.c. o————

3

(b) Group 2 uses the same lamp and is only given the following equipment:

lamp; ohmmeter; connecting leads.

What property of the lamp is measured by the ohmmeter?

1

(c) The results of both groups are combined and recorded in the table below.

I(A)	V(V)	R(Ω)	IV	I^2R
2	12	6		

(i) Use these results to complete the last two columns of the table.

2

(ii) What quantity is represented by the last two columns of the table?

1

(iii) What is the unit for this quantity?

1

Answer questions in your Homework Jotter.
Show working for each question.

29.

A student designs the circuit shown to operate a 12 V, 3 A lamp from a 36 V supply.
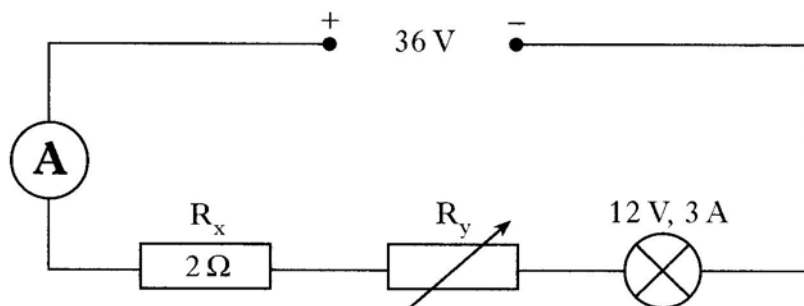
(a) What is the reading on the ammeter when the lamp is operating at its correct power rating?

(b) The resistance of R_x is $2\,\Omega$.

Calculate the voltage across R_x when the lamp is operating correctly.

(c) Calculate the resistance of R_y when the lamp is operating correctly.

(d) The student connects a second, identical lamp as shown in the diagram below.
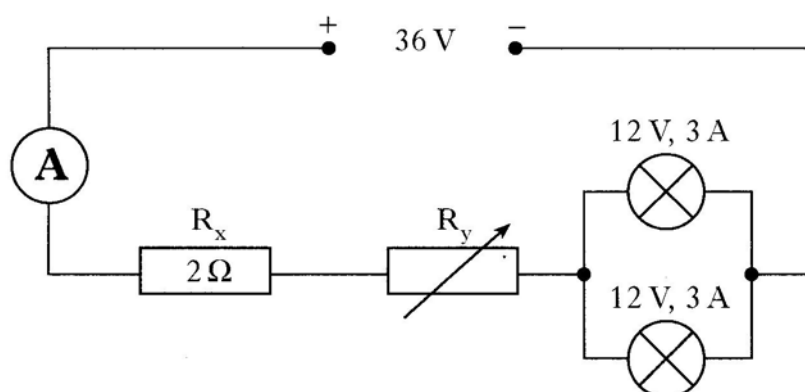
Explain why the resistance of R_y has to be adjusted for both lamps to operate correctly.

KU	PS
	1
2	
	3
	2

Credit Level
Answer questions in your Homework Jotter.
Show working for each question.

30.

The circuit diagram of the wiring of a car's sidelights and headlights is shown.
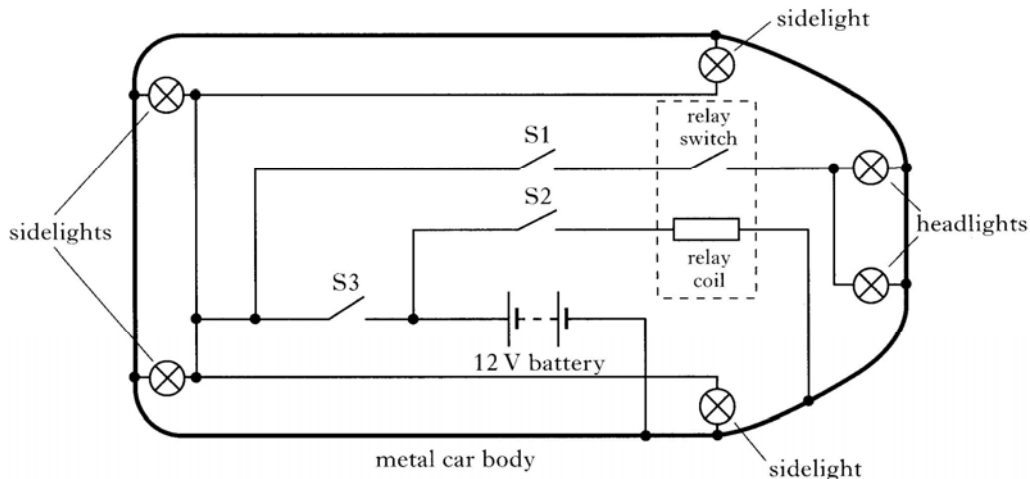
S1 is the headlight switch. S2 is the ignition switch.

When there is a current in the relay coil, the relay switch closes.

(a) Which lights are on when switch S3 **only** is closed?

(b) At night the car has the sidelights on and the headlights on. The driver switches off the ignition. This opens the ignition switch.

Explain why **only** the headlights go out.

(c) **Each** sidelight is rated at 12 V, 6 W, and **each** headlight is rated at 12 V, 55 W.

(i) Calculate the current in the battery when **only** the sidelights are on.

(ii) The driver leaves the car for 10 minutes with **only** the sidelights on.

Calculate the charge that flows through the battery in this time.

(iii) Each headlight gives out more light energy than each sidelight when on for the same time.

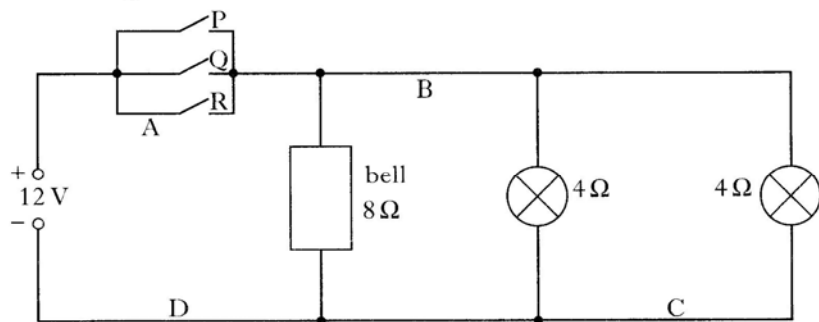Explain why this happens.

Credit Level
Answer questions in your Homework Jotter.
Show working for each question.

31.

A post office contains an emergency alarm circuit. Each of three cashiers has an alarm switch fitted as shown. Lamps come on and a bell sounds if an alarm switch is closed.

Switch P   Switch Q   Switch R

The circuit diagram for the alarm is shown.

(a) The alarm circuit is to be controlled by a master switch.

Which position, A, B, C or D, is most suitable for the master switch?

1

(b) Each lamp has a resistance of $4\,\Omega$ and the bell has a resistance of $8\,\Omega$. The circuit uses a 12 V supply.

2

   (i) Calculate the total resistance of the alarm circuit.

   (ii) Calculate the current from the supply when the alarm is operating.

2

(c) Brighter lamps are fitted in the alarm circuit.

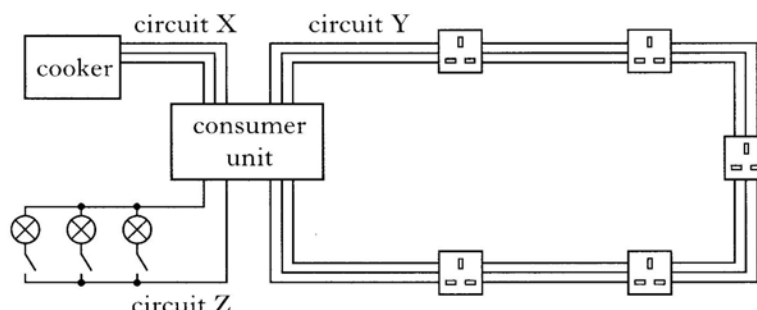Explain how this change affects the resistance of the circuit.

2

Credit Level
Answer questions in your Homework Jotter.
## Show working for each question.

32.

The diagram shows three household circuits, connected to a consumer unit.

(a)   (i)   Which circuit is a ring circuit?   **1**

(ii)   Give **two** advantages of using a ring circuit.   **2**

(b)   State and explain **one** difference between a lighting circuit and a ring circuit.   **2**

(c)   (i)   Why does a cooker need a separate circuit?   **1**

(ii)   One heating element of the cooker has a power rating of 2·2 kW.
Calculate how many joules of energy are transferred by this element in 2 hours.   **2**

(d)   (i)   What is the purpose of an earth wire?   **1**

(ii)   Explain how an earth wire works.   **2**

33.

The consumer unit in a house contains a mains switch and circuit breakers for different circuits.
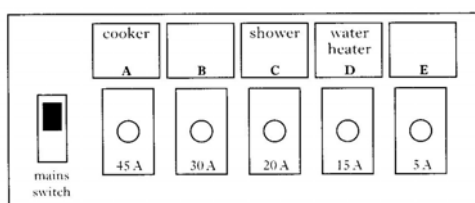
(a)   (i)   What is the purpose of the mains switch?   **1**

(ii)   Two of the circuits have not been labelled.   **1**

Which circuit is: the ring circuit?   the lighting circuit?

(iii)   The current ratings for the ring circuit and the lighting circuit are different.

State another difference between the ring circuit and the lighting circuit.   **1**

(b)   (i)   A 25 W lamp is designed to be used with mains voltage.   **3**

Calculate the resistance of the lamp.

(ii)   Four of these lamps are connected in parallel.   **2**
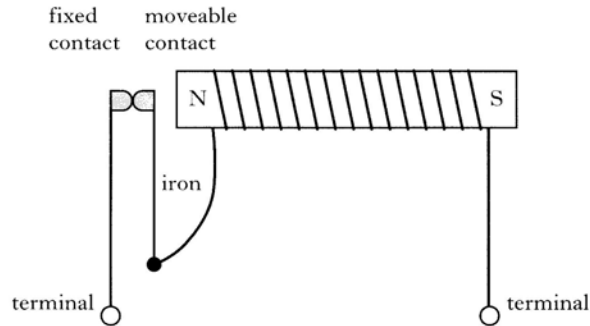
Calculate the **total** resistance of the lamps.

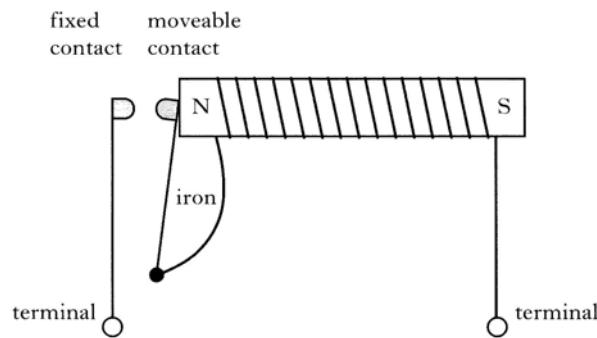**Physics (Standard Grade)**   **Using Electricity**   **Page 28**

<u>Credit Level</u>
Answer questions in your Homework Jotter.
Show working for each question.

34.

A circuit breaker as shown below is used in a circuit.

fixed moveable
contact contact

N \\\\\\\\\\\ S

iron

terminal   terminal

(a) (i) State **one** advantage of a circuit breaker compared to a fuse.

    (ii) The circuit breaker breaks the circuit when the current becomes too high.

fixed moveable
contact contact

N \\\\\\\\\\\ S

iron

terminal   terminal

Explain how the circuit breaker operates when the current becomes too high.

(b) A 5 ampere circuit breaker is used in a household lighting circuit which has three 60 W lamps as shown below.

5A circuit breaker

60 W   60 W   60 W

230 V
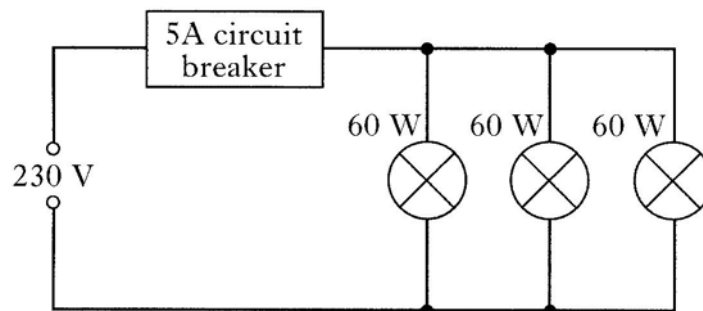
    (i) Show that the resistance of **one** lamp is 882 Ω.

    (ii) Calculate the combined resistance of the three lamps in this circuit.

    (iii) Show by calculation whether the circuit breaker will switch off the lamps when all three are lit.

KU values: 1, 2, 2, 2
PS values: 2, 3

Credit Level
Answer questions in your Homework Jotter.
Show working for each question.
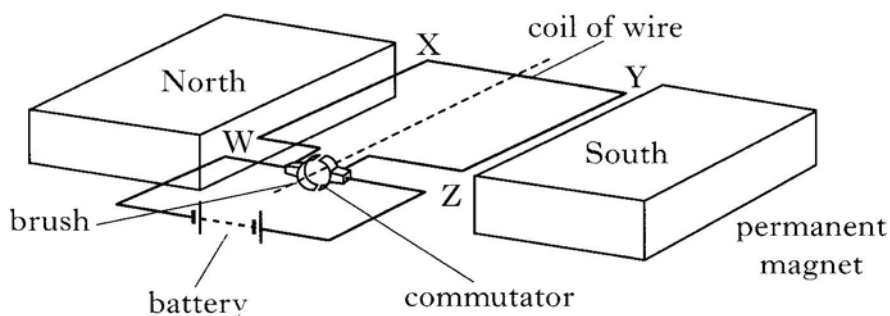
35.

A simple d.c. motor is shown in Figure 1.

Figure 1

(a) The coil WXYZ rotates in a clockwise direction.

State **two** changes that could be made to make the coil rotate in the opposite direction.

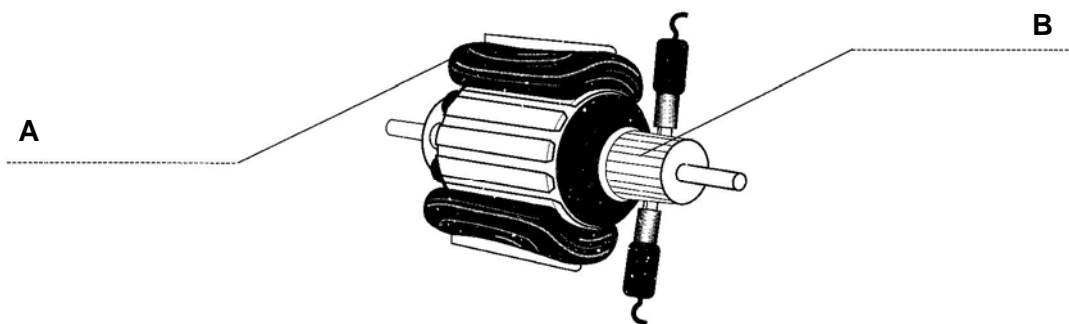(b) Part of a commercial electric motor is shown in Figure 2.

Figure 2

(i) Label the two parts indicated on the motor, using names from the list below.

brush   **commutator**   **field coil**   **rotating coil**

(ii) In the commercial electric motor, state why

(A) more than one rotating coil is used

(B) field coils rather than permanent magnets are used.

SQA Source Papers

General - Section		Paper	Question
Multiple Choice	1	2000	1
	2	2007	2
1.From the Wall Socket	3	2002	11
	4	2006	9
	5	2007	7
3. Resistance	6	2000	9
	7	2003	9
	8	2003	10
	9	2004	8
	10	2004	10
4. Useful Circuits	11	2000	8
	12	2001	9
	13	2002	10
	14	2003	11
	15	2007	9
5. Behind the Wall	16	2001	10
	17	2005	9
6. Movement from Electricity	18	2004	9

Credit - Section		Paper	Question
1.From the Wall Socket	19	2000	4
	20	2005	4
2. AC & DC Currents	21	2004	10
3. Resistance	22	2000	3
	23	2001	2
	24	2001	3
	25	2002	3
	26	2003	3
	27	2006	3
	28	2007	5
4. Useful Circuits	29	2003	6
	30	2004	4
	31	2005	5
5. Behind the Wall	32	2002	4
	33	2007	4
	34	2006	4
6. Movement from Electricity	35	2001	4