Specimen Paper

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Question	Mark
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
TOTAL	

General Certificate of Secondary Education
Foundation Tier

Additional Science Physics 2F

Unit Physics P2

F

Physics

Unit Physics P2

For this paper you must have:
- a ruler
- the Equations Sheet (enclosed).

You may use a calculator.

Time allowed
- 60 minutes

Instructions
- Use black ink or black ball-point pen.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.

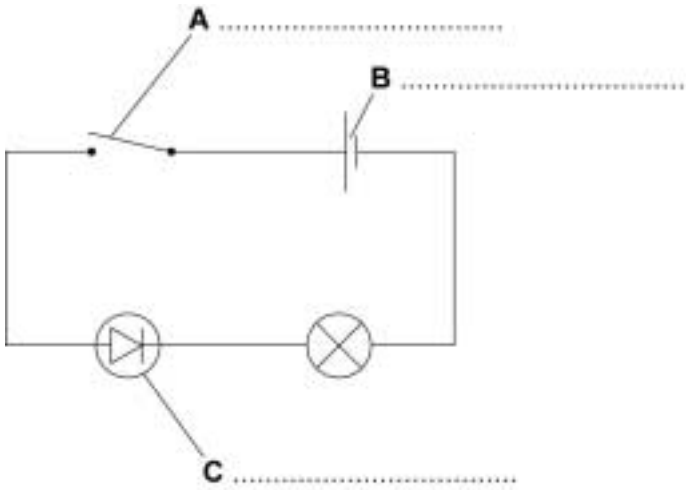
Information
- The marks for questions are shown in brackets.
- The maximum mark for this paper is 60.
- You are expected to use a calculator where appropriate.
- Question 10(c) should be answered in continuous prose.
  In this question you will be marked on your ability to:
  – use good English
  – organise information clearly
  – use specialist vocabulary where appropriate.

Advice
- In all calculations, show clearly how you work out your answer.

Answer **all** questions in the spaces provided.

1 Use words from the box to label the components, **A**, **B**, and **C**, in the circuit diagram.

cell	**diode**	**lamp**	**resistor**	**switch**

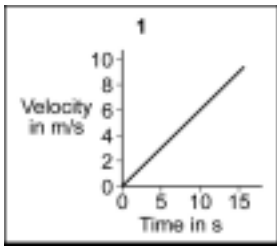
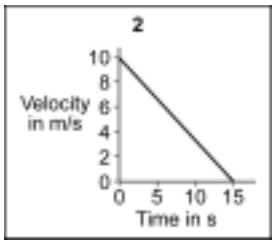
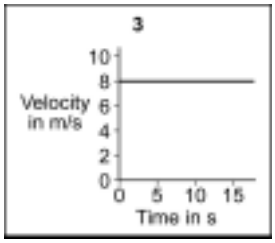


(3 marks)

3

2 The graphs in **List A** show how the velocities of three vehicles change with time. The statements in **List B** describe different motions.

Draw **one** line from each graph in **List A** to the description of the motion represented by that graph in **List B**.

List A **Velocity–time graphs**	**List B** **Descriptions of motion**
	Constant velocity
	Constant acceleration
	Not moving
	Constant deceleration

(3 marks)

3

Turn over for the next question

3 The diagram shows the forces acting on a skydiver.

Draw a ring around the correct answer to complete the following sentences.

3 (a) Force **J** is caused by

air resistance.

friction.

gravity.

(1 mark)

3 (b) Force **K** is caused by

air resistance.

gravity.

weight.

(1 mark)

3 (c) When the skydiver jumps from the aircraft, force **J** is

bigger than

the same as

smaller than

force **K**

and the skydiver

accelerates downwards.

accelerates upwards.

falls at a steady speed.

(2 marks)

4

Turn over for the next question

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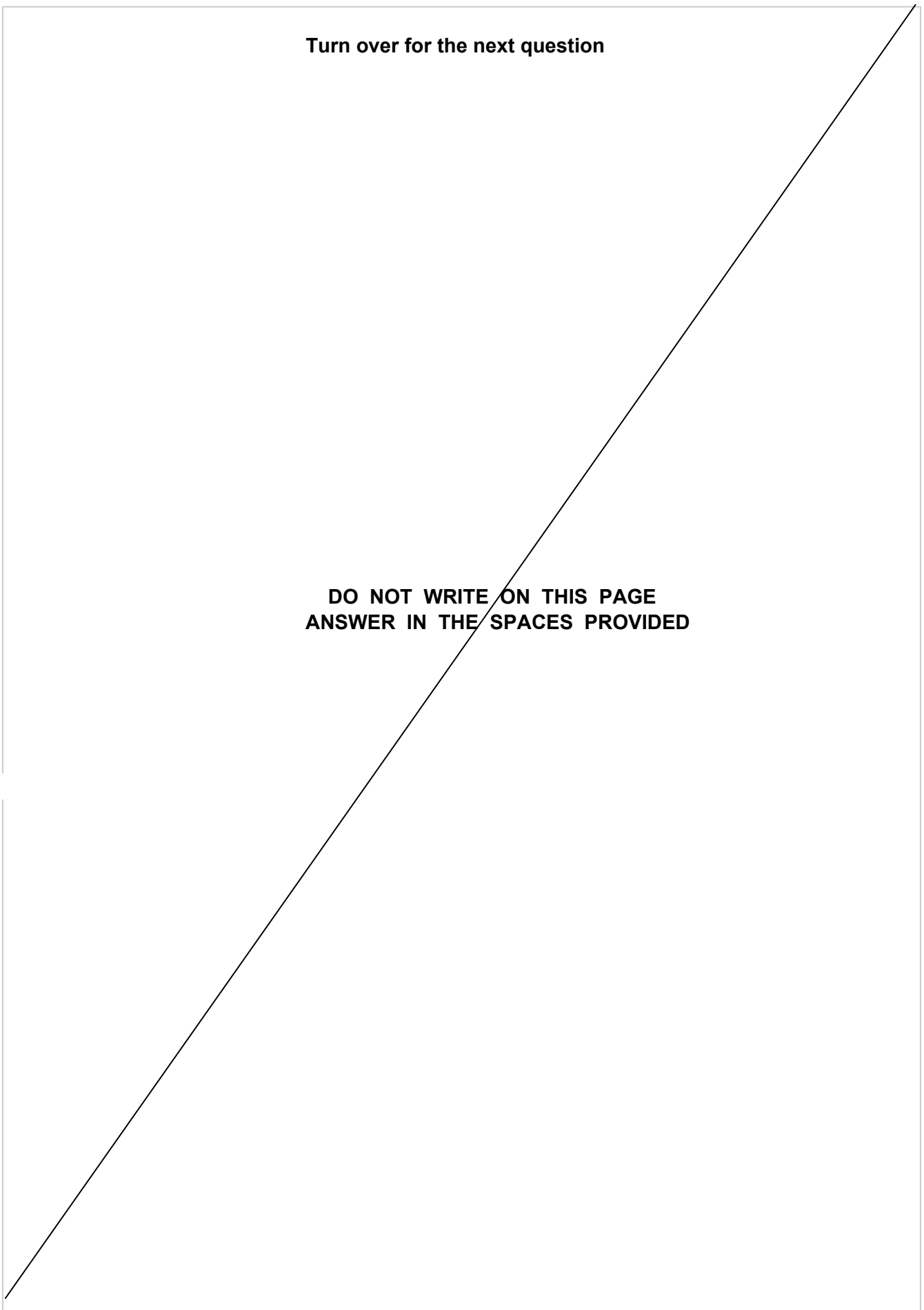
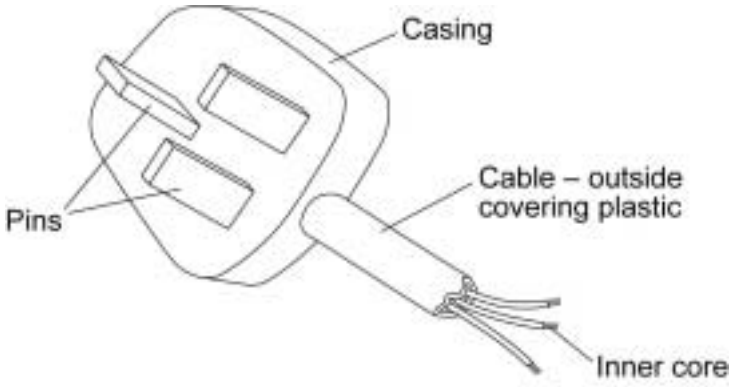
ANSWER IN THE SPACES PROVIDED



4 (a) The diagram shows a three-pin plug and electrical cable.



Name a suitable material to make the:

plug casing .....

inner core of the cable .....

Give the reason for your choice of each material.

plug casing .....

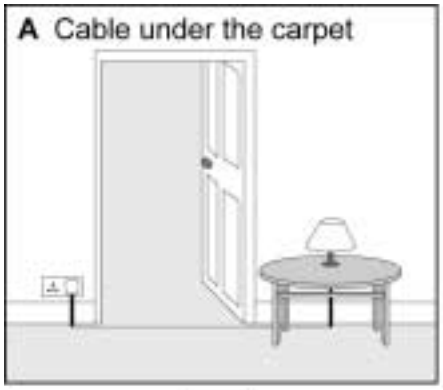
.....

inner core of the cable .....

.....

(4 marks)

4 (b) The pictures show mains electricity being used to operate various devices. Some of the pictures show the electricity being used in a dangerous way.



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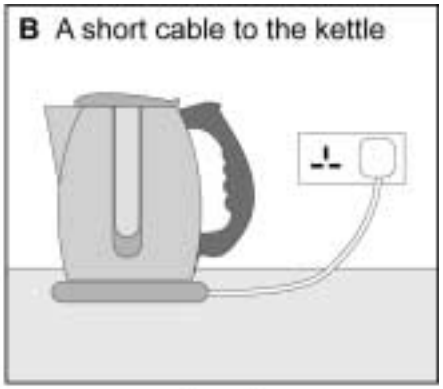

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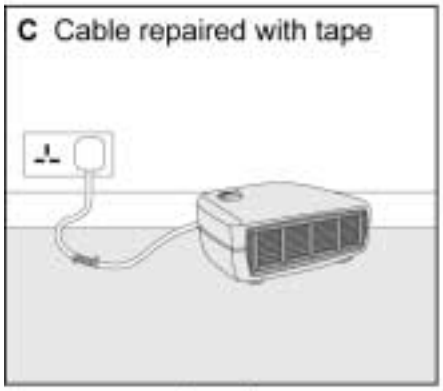

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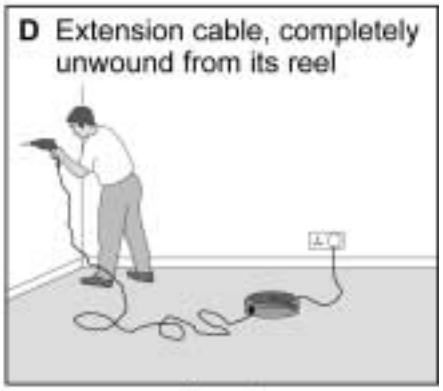

☐

In the box underneath each picture put:

a tick (✓) if the electricity is being used safely

a cross (×) if the electricity is being used dangerously.

(2 marks)

6

Turn over▶

5 (a) The diagram shows the horizontal forces acting on a car travelling along a straight road.

5 (a) (i) Calculate the size of the resultant force acting on the car.

Show clearly how you work out your answer.

.....

.....

Resultant force = ...N

(2 marks)

5 (a) (ii) Describe the motion of the car when the forces shown in the diagram act on it.

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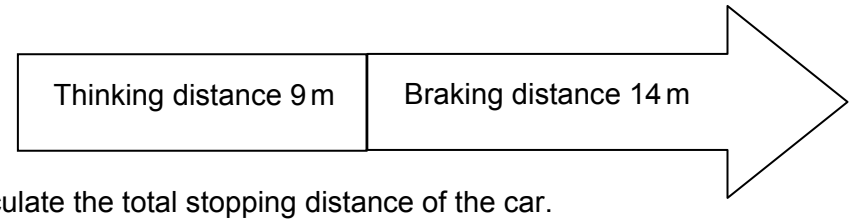
(2 marks)

5 (b) A car driver makes an emergency stop.

The chart shows the 'thinking distance' and the 'braking distance' needed to stop the car.



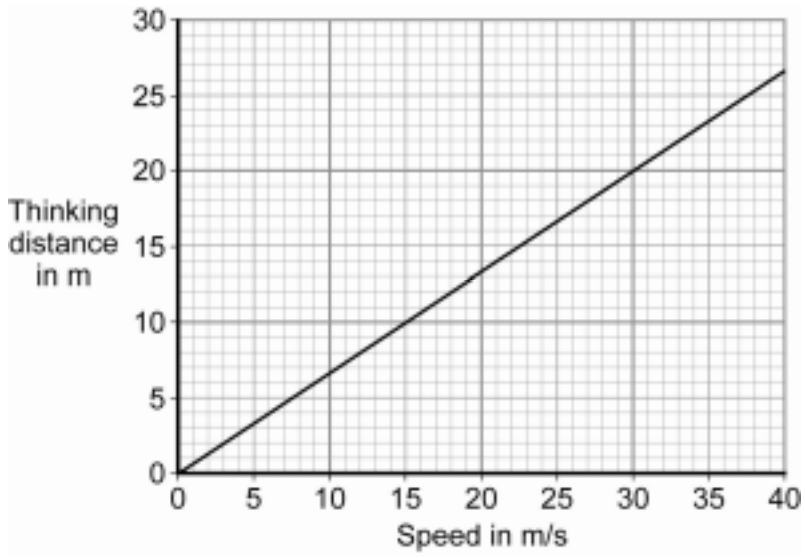
5 (b) (i) Calculate the total stopping distance of the car.

.....

Stopping distance = ... m

(1 mark)

5 (b) (ii) The graph shows that speed affects thinking distance.



Use the graph to find the thinking distance for a car driven at 30 m/s.

Thinking distance = ... m

(1 mark)

5 (b) (iii) Give **one** further factor that will affect the thinking distance.

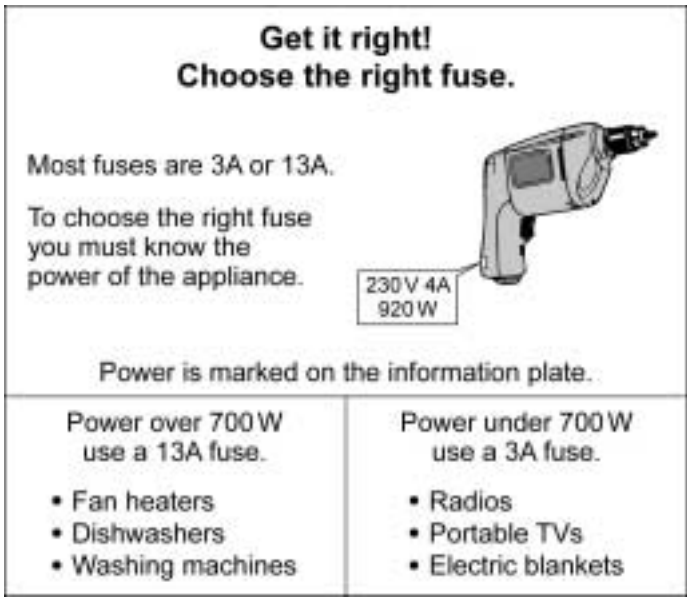
.....

(1 mark)

7

Turn over▶

6 (a) Look at the electrical safety information poster.



6 (a) (i) Complete the table to show which size fuse, 3 A or 13 A, should be fitted to each of the appliances.

Appliance	Power	Fuse
Kettle	2200 W	
Hair straighteners	75 W	
Coffee maker	1260 W	

(2 marks)

6 (a) (ii) The plug of a washing machine has been wrongly fitted with a 3 A fuse.
Explain why the washing machine stops working shortly after it is switched on.

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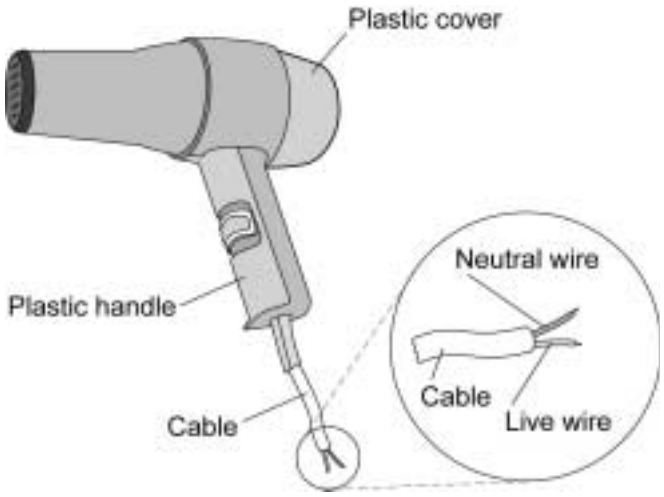
(2 marks)

6 (b) The diagram shows a hairdryer. The cable connecting the hairdryer to the plug does not have an earth wire.



6 (b) (i) Why does the hairdryer **not** need a cable with an earth wire?

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(1 mark)

6 (b) (ii) The hairdryer takes a current of 5 A from the 230 V mains electricity supply.

Calculate the power of the hairdryer.

Write down the equation you use, and then show clearly how you work out your answer.

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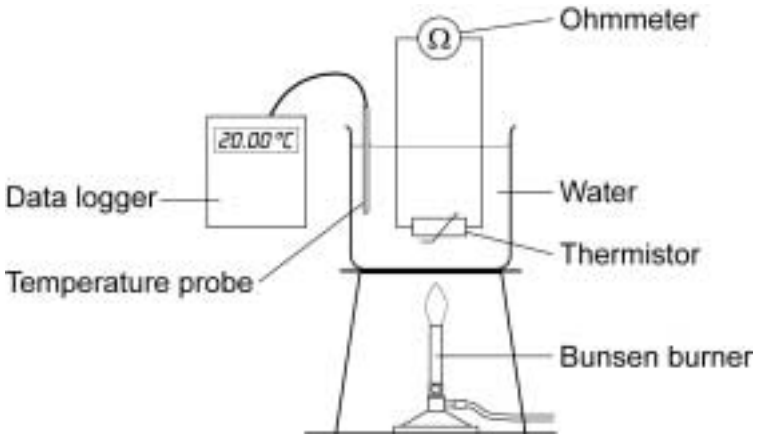
Power = ... W

(2 marks)

7

Turn over▶

7 A student used the apparatus below to find out how the resistance of a thermistor changes with temperature.



The student heated the water slowly using a Bunsen burner.
The resistance of the thermistor was measured using an ohmmeter.

7 (a) (i) Before doing the experiment the student completed a risk assessment.

Which **one** of the following is a hazard in this experiment?

Tick (✓) **one** box.

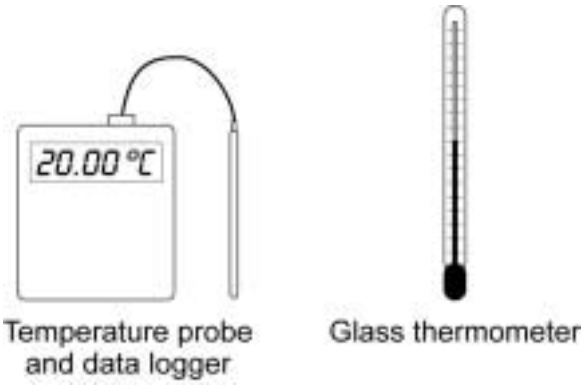
Using an ohmmeter near water ☐

Boiling water in a beaker ☐

Hanging the thermistor in water ☐

(1 mark)

7 (a) (ii) The student measured the water temperature using a temperature probe and data logger rather than a glass thermometer.



Give **two** reasons for using a temperature probe and data logger rather than a glass thermometer to measure temperature.

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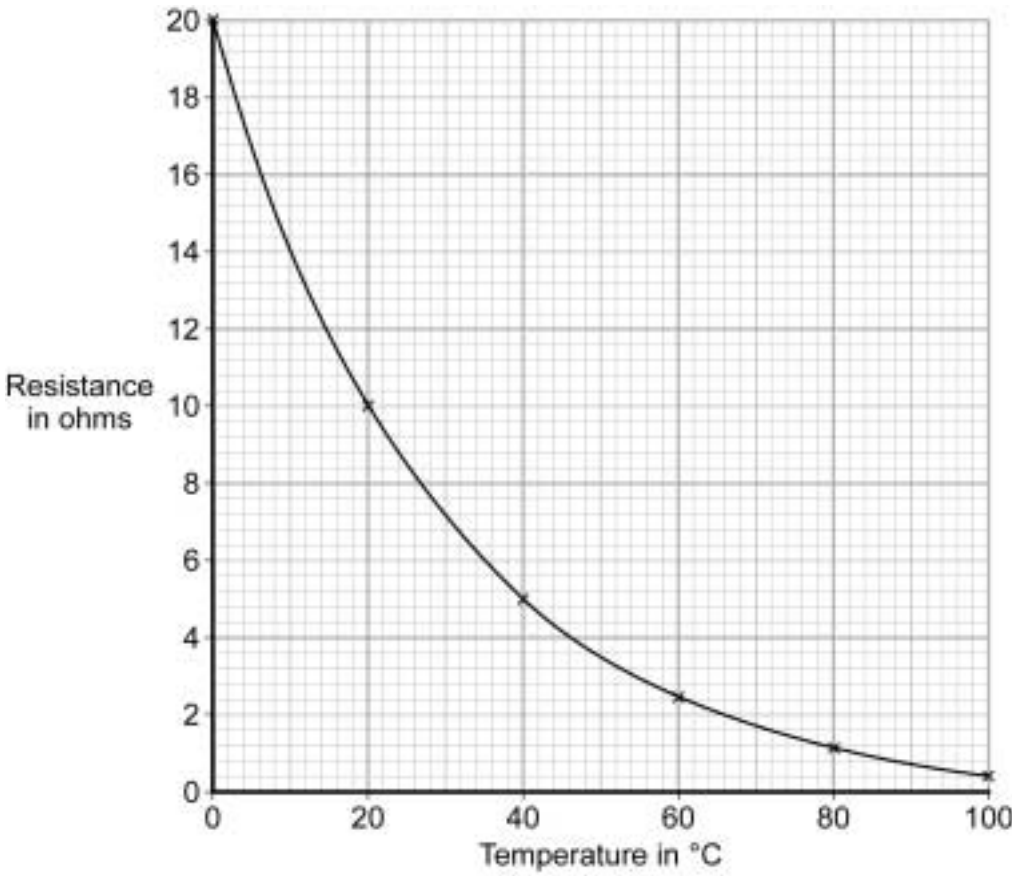
(2 marks)

Question 7 continues on the next page

Turn over▶

7 (b) The data obtained by the student is displayed in the graph.



What conclusions should the student make from the data displayed in the graph?

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(3 marks)

7 (c) In which **one** of the following circuits is there likely to be a thermistor?

Tick (✓) **one** box.

One that automatically switches lights on when it gets dark ☐

One that automatically monitors the moisture level in soil ☐

One that acts as a thermostat to switch heating on and off ☐

(1 mark)

7

Turn over for the next question

8 The diagram shows a supermarket worker stacking jars of coffee onto a shelf.

8 (a) The mass of each jar of coffee is 0.4 kg.

Calculate the weight of each jar of coffee.

gravitational field strength = 10 N/kg

Write down the equation you use, and then show clearly how you work out your answer.

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Weight = ... N

(2 marks)

8 (b) The distance between the floor and the middle shelf is 1.2 m.

Calculate the work done to lift one jar of coffee from the floor onto the shelf.

Write down the equation you use, and then show clearly how you work out your answer and give the unit.

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Work done = ...

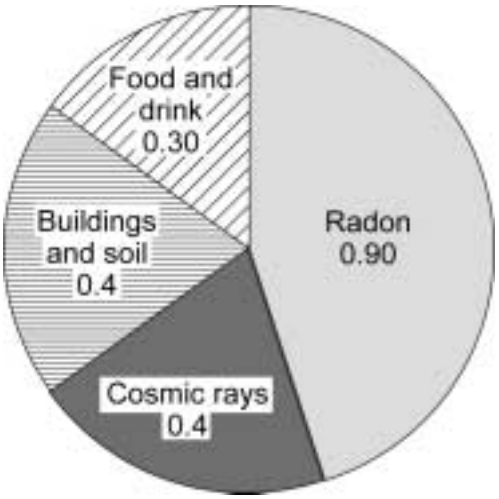
(3 marks)

5

Turn over for the next question

9 The pie chart shows the average radiation dose that a person in the UK receives each year from natural background radiation.

The doses are measured in millisieverts (mSv).



9 (a) Some types of job increase the radiation dose a worker receives.
People working as aircrew receive an increased radiation dose due to flying at high altitude.

9 (a) (i) The radiation dose from which source of background radiation is increased by flying?

.....

(1 mark)

9 (a) (ii) The following table gives the average additional radiation dose received by aircrew flying to various destinations from London.

Destination	Flight time in hours	Average additional radiation dose in mSv
Edinburgh	1	0.004
Istanbul	5	0.025
Toronto	8	0.050
Los Angeles	11	0.065
Tokyo	13	0.075

What is the relationship between flight time and average additional radiation dose?

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(1 mark)

9 (a) (iii) A flight from London to Jamaica takes 10 hours.

Estimate the likely value for the average additional radiation dose received by people on this flight.

Average additional radiation dose = ... mSv

Give a reason for your answer.

.....

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(2 marks)

Question 9 continues on the next page

9 (b) The following table gives the effects of different radiation doses on the human body.

Radiation dose in mSv	Effects
10 000	Immediate illness; death within a few weeks
1 000	Radiation sickness; unlikely to cause death
100	Lowest dose with evidence of causing cancer

A businessman makes 10 return flights a year from London to Tokyo.

Explain whether the businessman should be concerned about the additional radiation dose received during the flights.

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(2 marks)

9 (c) In a study of 3900 aircrew it was found that 169 had developed leukaemia, a form of cancer. In a similar sized sample of non-aircrew the number of leukaemia cases was 156.

Suggest why it would be difficult to be certain that the leukaemia developed by the aircrew was caused by flying.

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(2 marks)

8

Turn over for the next question

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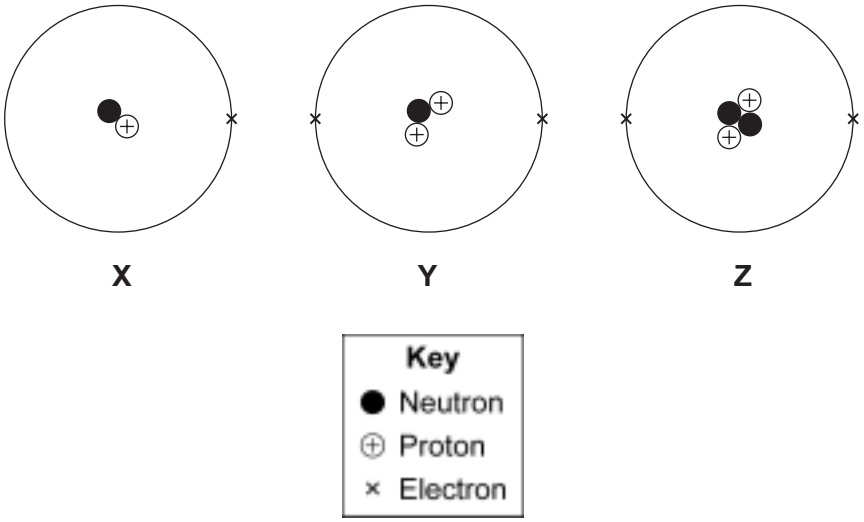
ANSWER IN THE SPACES PROVIDED

10 (a) The diagrams represent three atoms, **X**, **Y** and **Z**.



Which of these atoms are isotopes of the same element?

.....

Give a reason for your answer.

.....

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(2 marks)

10 (b) In a star, nuclei of atom **X** join to form nuclei of atom **Y**.

Complete the sentences.

The process by which nuclei join to form a larger nucleus is called

nuclear ..... .

This is the process by which a star releases ..... .

(2 marks)

10 (c) *In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.*

A star goes through a life cycle.

Describe the life cycle of a star like the Sun.

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(6 marks)

10

END OF QUESTIONS

There are no questions printed on this page

DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED

AQA

GCSE Physics Equations Sheet

Unit 2 F

$a = \frac{F}{m}$ or $F = m \times a$	F resultant force m mass a acceleration
$a = \frac{v - u}{t}$	a acceleration v final velocity u initial velocity t time taken
$W = m \times g$	W weight m mass g gravitational field strength
$F = k \times e$	F force k spring constant e extension
$W = F \times d$	W work done F force applied d distance moved in the direction of the force
$P = \frac{E}{t}$	P power E energy transferred t time taken
$E_p = m \times g \times h$	E_p change in gravitational potential energy m mass g gravitational field strength h change in height

$E_k = {}^1/_2 \times m \times v^2$	E_k kinetic energy m mass v speed
$p = m \times v$	p momentum m mass v velocity
$I = \frac{Q}{t}$	I current Q charge t time
$V = \frac{W}{Q}$	V potential difference W work done Q charge
$V = I \times R$	V potential difference I current R resistance
$P = \frac{E}{t}$	P power E energy t time
$P = I \times V$	P power I current V potential difference
$E = V \times Q$	E energy V potential difference Q charge