Sc

KEY STAGE
3

TIER
3–6

2007

Science test

Paper 2

First name _____

Last name _____

School _____

Remember

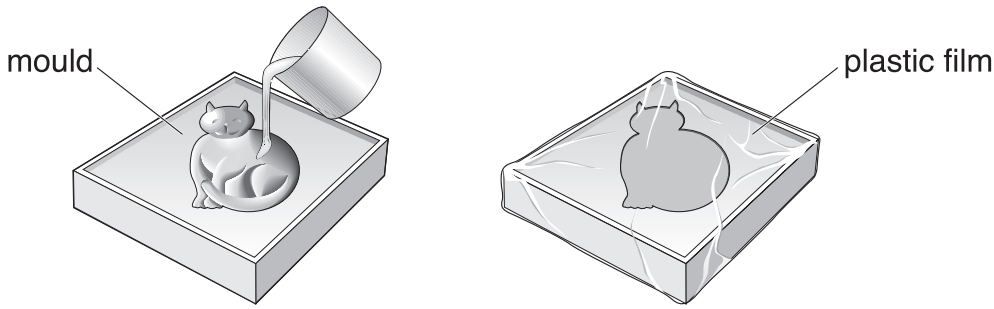
- The test is 1 hour long.
- You will need: pen, pencil, rubber, ruler, protractor and calculator.
- The test starts with easier questions.
- Try to answer all of the questions.
- The number of marks available for each question is given below the mark boxes in the margin. You should not write in this margin.
- If you are asked to plan an investigation, there will be space for you to write down your thoughts and ideas.
- Do not use any rough paper.
- Check your work carefully.
- Ask your teacher if you are not sure what to do.

For marker's use only

TOTAL MARKS	

1. Sam made a model cat.

He mixed modelling powder with water.
He poured all of the mixture into a mould.
He covered the mould with plastic film so that water could **not** evaporate.



(a) (i) After 10 minutes, Sam removed the model cat from the mould.

Sam had mixed 40 g of modelling powder with 12 g of water.
What was the mass of the model cat?

_____ g

1ai
1 mark

(ii) Complete the sentence below using words from the list.

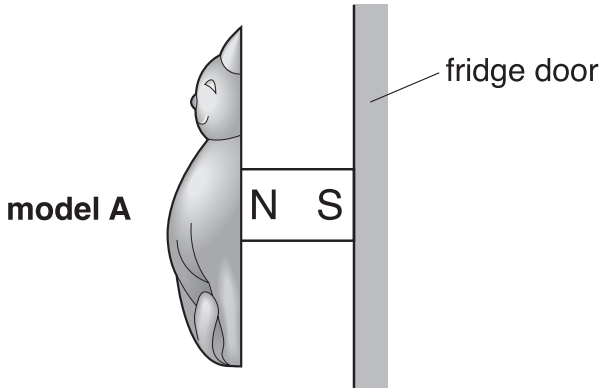
gas **liquid** **solid** **vapour**

After 10 minutes, the mixture in the mould changed from a

_____ into a _____.

1aii
1 mark

(b) Sam attached a small magnet to the model cat.
The magnet was attached to the fridge door.



What metal are magnets made from?

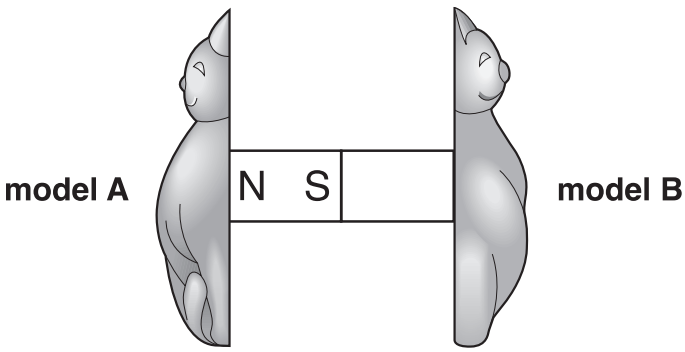
_____

1b
1 mark

(c) Sam made another model, B. He attached a small magnet to model B.

(i) Sam placed model A next to model B. The magnets attracted each other.

Label the poles on the magnet on model B.
Use the letters N and S.



1ci
1 mark

(ii) Sam then turned the magnet on model A around.
What would happen to model B?

_____

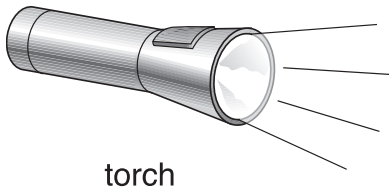
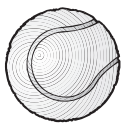
1cii
1 mark

maximum 5 marks

Total
5

2. (a) Sita made a model of three parts of the solar system, the Sun, Earth and Moon. She used a marble, a torch and a tennis ball.

Draw a line from each part of the solar system to the object she used.
Draw only **three** lines.

part of the solar system	**object**
Sun	 marble
Earth	 torch
Moon	 tennis ball

2a
1 mark

2a
1 mark

(b) The table below shows the order of some of the planets in our solar system.

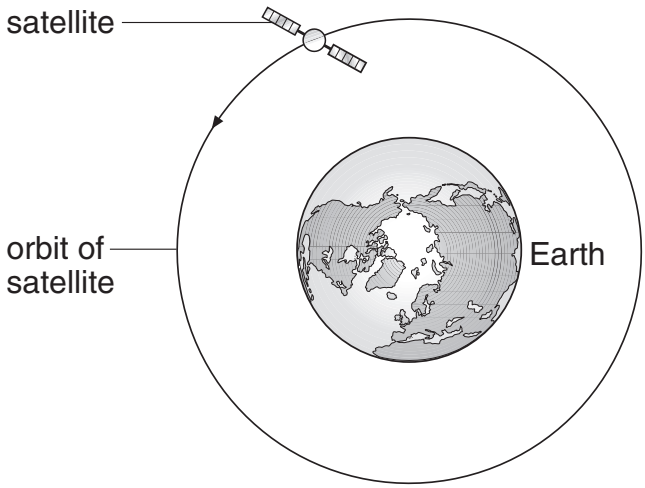
Complete the table to show the positions of the Earth, Neptune and the Sun.

2b
1 mark

	Mercury	Venus		Mars	Jupiter	Saturn	Uranus	

2b
1 mark

(c) The diagram shows a satellite in orbit around the Earth.



not to scale

(i) Give **one** use of a satellite.

_____

_____

2ci
1 mark

(ii) Which force keeps the satellite in orbit around the Earth?
Tick the correct box.

gravity	☐	friction	☐
air resistance	☐	magnetism	☐

2cii
1 mark

maximum 6 marks

Total
6

3. Pupils investigate the time taken for different types of trainer to slide down a ramp.

(a) What would they use to measure the time for each trainer to slide down the ramp?

_____

3a

1 mark

(b) Which unit of measurement should they use to record the time taken for the trainer to slide down the ramp?
Tick the correct box.

hours ☐ N ☐ cm ☐ g ☐ s ☐

3b

1 mark

(c) Which factor do they change as they carry out their investigation?
Tick the correct box.

the angle of the ramp	☐	the length of the ramp	☐
the type of trainer	☐	the person recording the results	☐
the surface of the ramp	☐	the distance each trainer moves down the ramp	☐

3c

1 mark

(d) Which **three** factors should they keep the same in their investigation?
Tick the **three** correct boxes.

the angle of the ramp	☐	the length of the ramp	☐
the type of trainer	☐	the colour of each trainer	☐
the surface of the ramp	☐	the time the trainer takes to reach the bottom of the ramp	☐

☐ 3d
1 mark

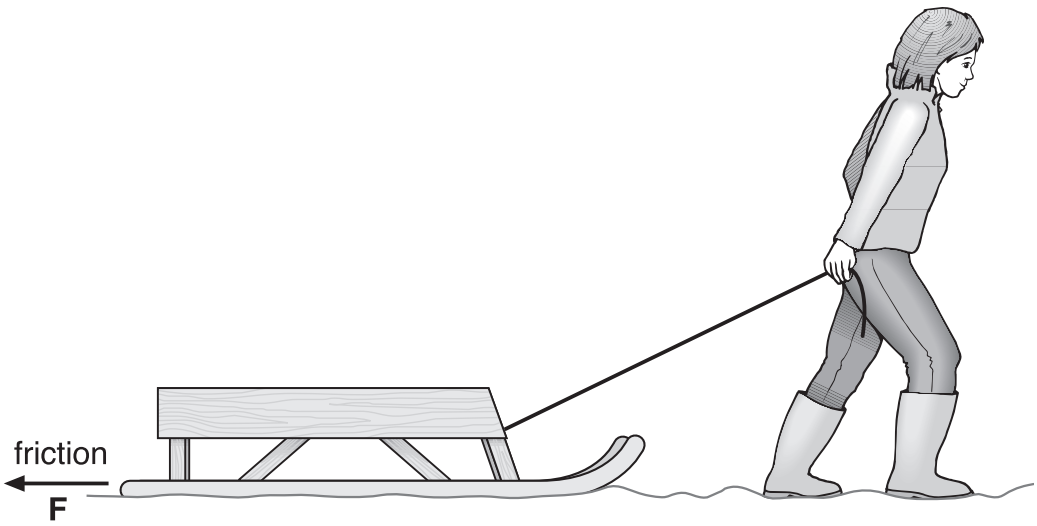
☐ 3d
1 mark

maximum 5 marks

Total
☐
5

[Blank page]

4. Sally pulls a sledge in the snow.



(a) (i) Draw an arrow on the rope to show the direction of the force of the rope on the sledge.

Label the arrow **R**.

4ai

1 mark

(ii) Draw an arrow on the diagram to show the direction of the force of gravity on the sledge.

Label the arrow **G**.

4aii

1 mark

(b) Force **F** is the friction between the sledge and the snow.
Sally then pulled the sledge over a concrete path.

Friction is less on snow than on concrete.
Give the reason for this.

_____

4b

1 mark

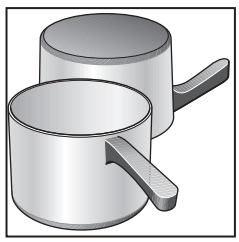
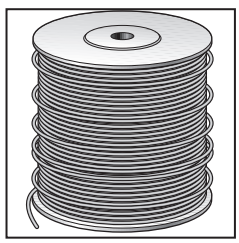
maximum 3 marks

Total

3

5. (a) The drawings below show three objects made from copper.

Draw a line from each object to the reason for using copper for that object.
Draw only **three** lines.

object made from copper	**reason for using copper**
 base of a saucepan	It does **not** rust.
 coin	It is a good conductor of electricity.
 wires in a cable	It is a good conductor of heat.
	It is **not** magnetic.

5a
1 mark

5a
1 mark

5a
1 mark

(b) Brass is a mixture of copper and zinc. Some keys are made from brass.

Why is brass more suitable than copper for a **key**?
Tick the **two** correct boxes.

Brass does **not** bend as easily as copper.	☐	Brass is a paler colour than copper.	☐
Brass is harder than copper.	☐	Brass is **not** as shiny as copper.	☐
Brass is **not** such a good conductor of electricity as copper.	☐	Brass is **not** such a good conductor of heat as copper.	☐

☐ 5b
1 mark

☐ 5b
1 mark

(c) Zinc melts at 420°C.
Copper melts at 1085°C.

A scientist heated a mixture of pieces of zinc and pieces of copper to 600°C in a dish.

What would be in the dish at 600°C?
Tick the correct box.

liquid zinc and liquid copper	☐	liquid zinc and solid copper	☐
solid zinc and liquid copper	☐	solid zinc and solid copper	☐

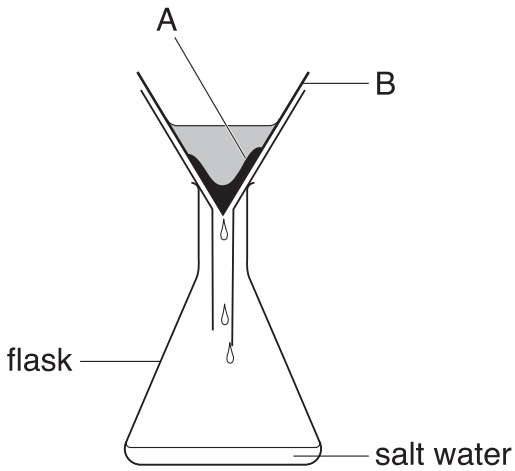
☐ 5c
1 mark

maximum 6 marks

Total
☐
6

6. Chris collected some sea water near a beach.
The sea water had salt dissolved in it. It had sand mixed in it.

(a) Chris separated the sand from the salt water as shown below.



(i) What is this method of separation called?
Tick the correct box.

chromatography	☐	distillation	☐
filtration	☐	magnetism	☐

☐ 6ai
1 mark

(ii) What is substance A?

_____

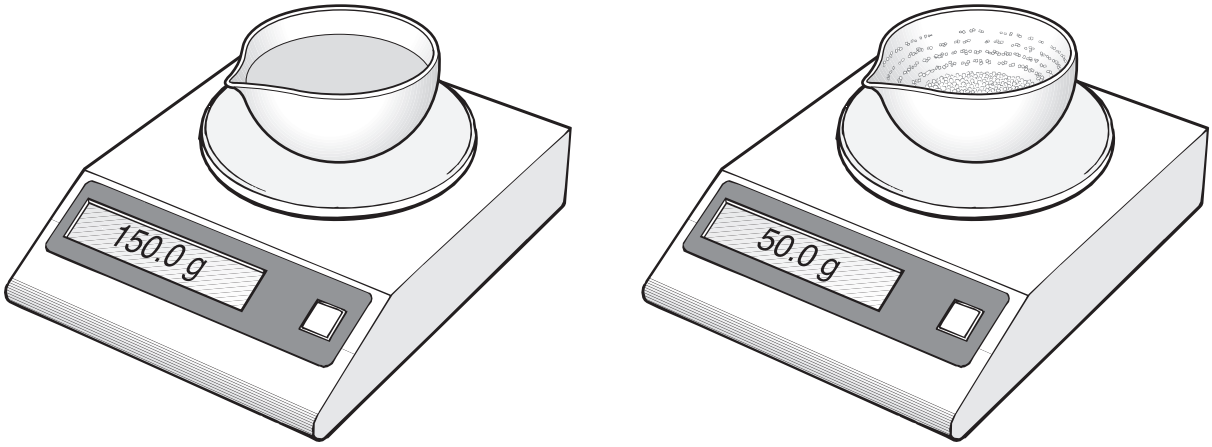
☐ 6aii
1 mark

(iii) What is the part labelled B?

_____

☐ 6aiii
1 mark

(b) Chris poured some of the salt water from the flask into a dish.
He put the dish on a balance and left it in a warm room for a week.



(i) Look at the two readings on the balance.

Work out the decrease in mass.

_____ g

6bi

1 mark

(ii) After one week there was a white solid but **no** liquid in the dish.
What had happened to the water in the dish?

_____

6bii

1 mark

(iii) What was the white solid left in the dish?

_____

6biii

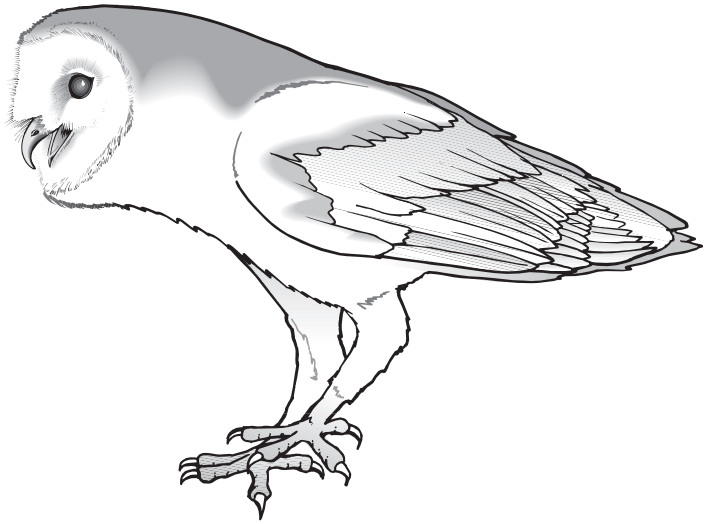
1 mark

maximum 6 marks

Total

6

7. The drawing below shows a barn owl.
Barn owls hunt for small animals such as mice.



(a) (i) Look at the drawing of the barn owl.

Give **two** ways the barn owl is suited for catching small animals.

1. _____

2. _____

7ai
1 mark

7ai
1 mark

(ii) Draw a line from each animal below to the word that describes it.
Draw only **two** lines.

animal	**word that describes the animal**
	predator
mouse	
	prey
barn owl	
	producer

7aii
1 mark

7aii
1 mark

(b) The photograph below shows two young barn owls.
They are covered with soft feathers.

Why do the young barn owls need feathers?

_____

_____

7b
1 mark

(c) Barn owls build nests in farm buildings. Mice eat wheat seeds.

(i) Many old farm buildings have been knocked down so that houses can be built on the farmland.

Give **one** reason why this has caused the number of barn owls to decrease.

_____

_____

7ci
1 mark

(ii) Suggest **one** reason why farmers like to have barn owls on their farms.

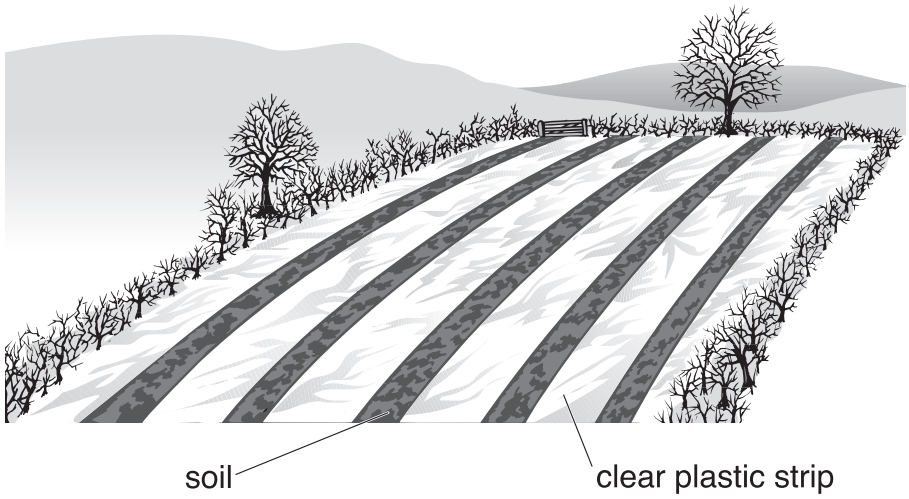
_____

7cii
1 mark

maximum 7 marks

Total
7

8. Potatoes have just been planted in a field.
The rows of potatoes are covered with clear plastic strips.



(a) (i) The potatoes were planted in winter.

How will the plastic strips help the potatoes to start to grow?

_____

8ai
1 mark

(ii) Complete the sentences below with words from the list.

air **heat** **light** **water**

The plastic strips covering the growing potato plants must be **clear** so the leaves will get enough _____.

8aii
1 mark

The potato plants grow well because the gaps between the plastic strips will let _____ and _____ get into the soil.

8aii
1 mark

8aii
1 mark

(b) The plastic strips break down naturally after a few weeks.

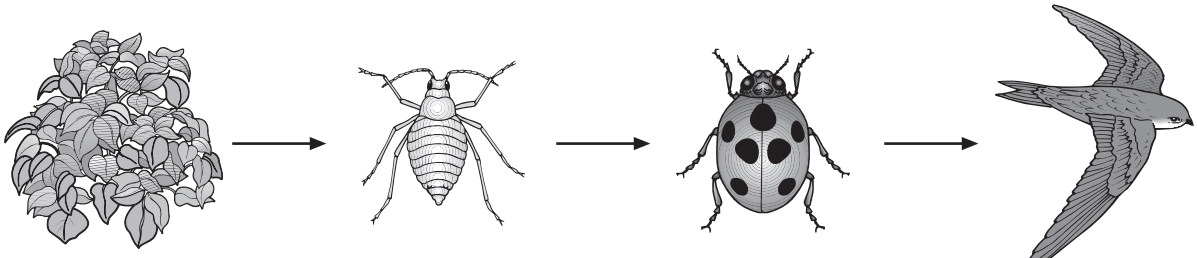
Suggest why it is useful that the plastic strips break down naturally.

_____

_____

8b
1 mark

(c) Aphids are insects that feed on potato leaves.
Aphids and potato plants are part of the food chain shown below.



plant (potato leaves) → **aphid** → **ladybird** → **swift**

not to scale

(i) Some farmers put ladybirds on their potato plants to get rid of aphids.

How do ladybirds get rid of aphids?

_____

_____

8ci

1 mark

(ii) What else could farmers use to get rid of aphids?
Tick the correct box.

fertiliser	☐	insecticide	☐
slug pellets	☐	weedkiller	☐

8cii

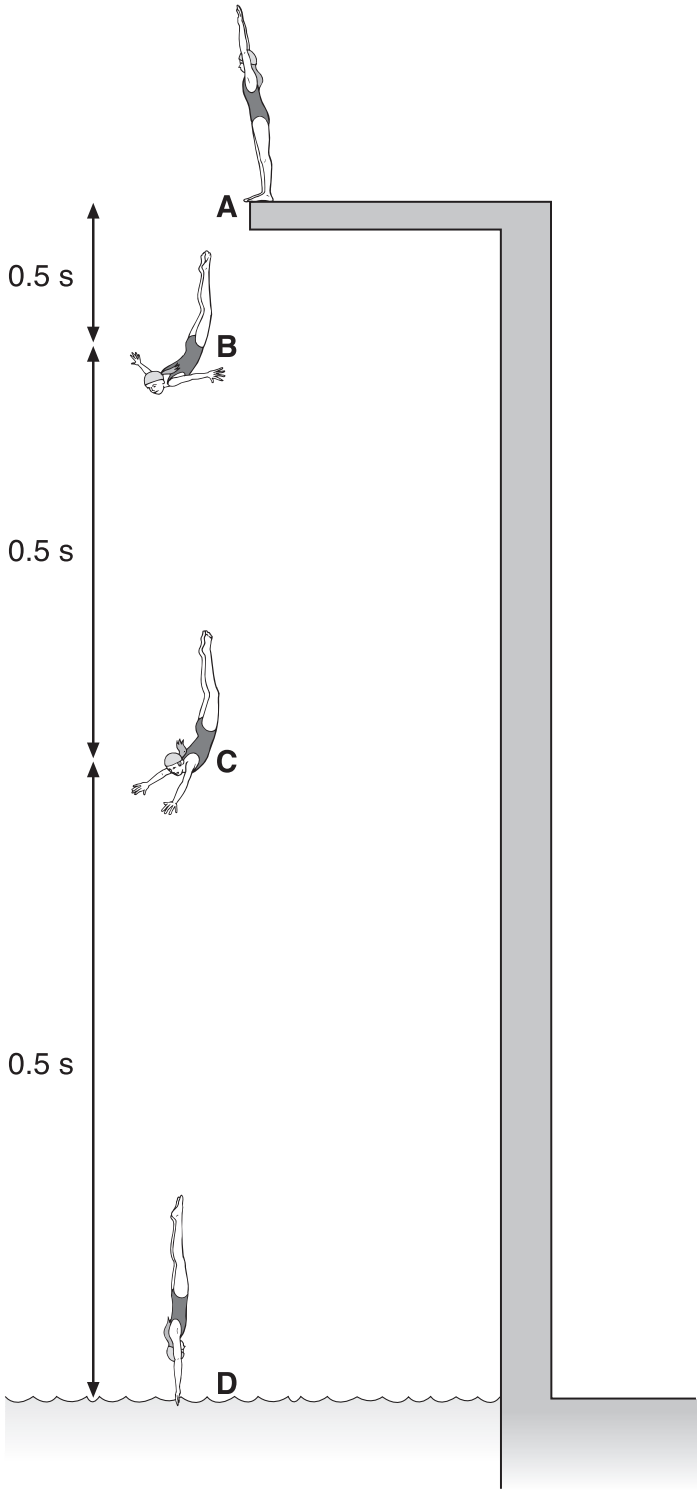
1 mark

maximum 7 marks

Total

7

9. The drawings below show Caroline diving into a swimming pool.
As she falls, gravitational potential energy is changed into kinetic energy.



(a) Why does Caroline have **no** kinetic energy at A?

9a

1 mark

(b) The table shows Caroline's gravitational potential energy and kinetic energy at four stages of the dive.

stage of the dive	total energy (kJ)	gravitational potential energy (kJ)	kinetic energy (kJ)
A	8	8	0
B	8	7	1
C	8	4	4
D	8	0	

(i) Write the missing kinetic energy value for stage D in the table.

9bi
1 mark

(ii) As Caroline falls there is **no** loss of energy to the air.
How do the energy values for stages A, B, C and D show this?

_____

_____

9bii
1 mark

(c) (i) Give the name of the force that causes Caroline to speed up as she falls.

_____

9ci
1 mark

(ii) Caroline takes 0.5 s to fall from A to B **and** from B to C **and** from C to D.
How can you tell from the drawings opposite that she is speeding up as she falls?

_____

_____

9cii
1 mark

(d) When Caroline enters the water she slows down.
Give the name of the force that slows her down.

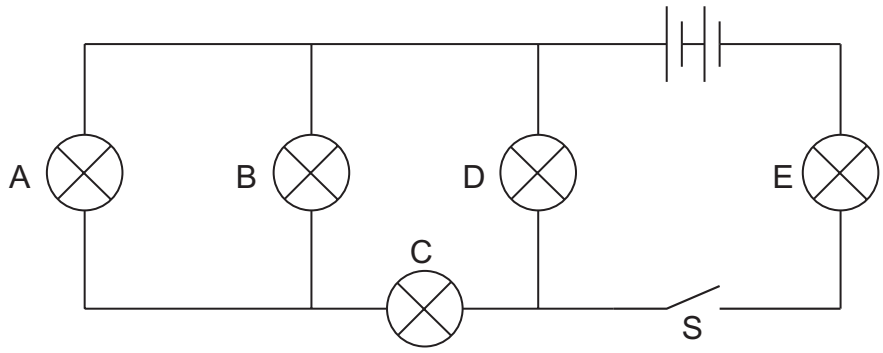
_____

9d
1 mark

maximum 6 marks

Total
6

10. (a) Max built **circuit 1** as shown below.



circuit 1

He closed the switch, S, and all the bulbs came on.
One of the bulbs then broke and **all** the bulbs went off.

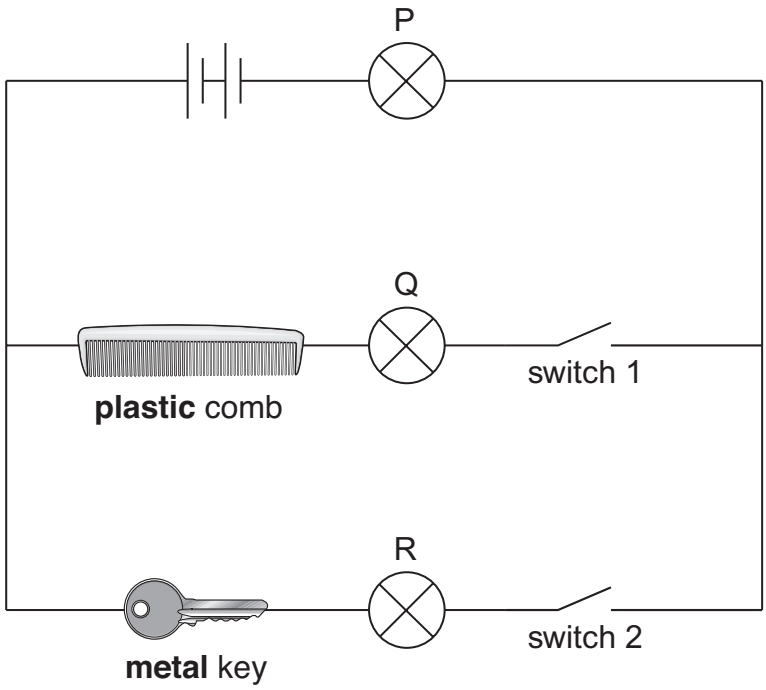
Which bulb must have broken?
Give the letter.

10a

1 mark

_____

(b) Max built **circuit 2** as shown below.
He connected a plastic comb and a metal key in different parts of the circuit.



circuit 2

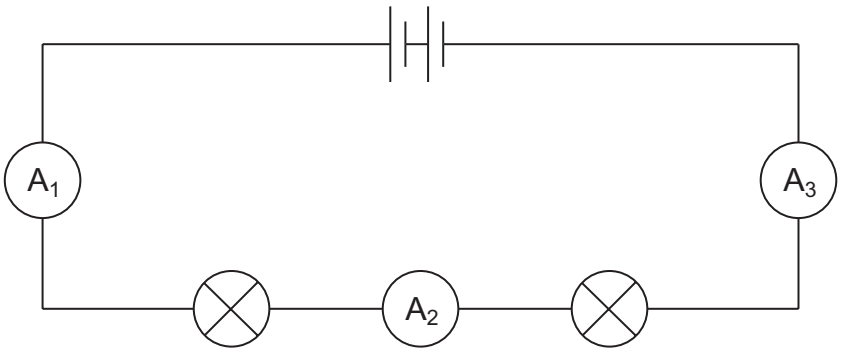
Look carefully at **circuit 2**.
Complete the table below to show which bulbs in circuit 2 will be on or off when different switches are open or closed.
Write **on** or **off** in the boxes below.

switch 1	switch 2	bulb P	bulb Q	bulb R
open	open	off	off	off
open	closed			
closed	open			

10b
1 mark

10b
1 mark

(c) Max built **circuit 3** using a battery, two bulbs and three ammeters.



circuit 3

The current reading on ammeter A_1 was 0.8 amps.
What would be the reading on ammeters A_2 and A_3?
Place **one** tick in the table by the correct pair of readings.

reading on ammeter A_2 (amps)	reading on ammeter A_3 (amps)	correct pair of readings
0.8	0.8	
0.8	0.4	
0.4	0.8	
0.4	0.4	

10c
1 mark

maximum 4 marks

Total
4

11. Some pupils made an electric cell using two different metals and a lemon. They put strips of copper and zinc into a lemon and connected them to the terminals of an electric clock.

(a) Look at the photograph.

What evidence is there that they have made an electric cell?

_____

11a

1 mark

(b) The pupils had pieces of copper, zinc, iron and magnesium and some lemons.
They wanted to find out which pair of metals made the cell with the biggest voltage.

What equipment should they use to measure the voltage of their cells?

_____

11b

1 mark

(c) In their investigation they used different pairs of metals.

Give **one** factor that they should keep the same.

_____

11c

1 mark

(d) The pupils measured the voltage produced by different pairs of metals. Their results are recorded below.

	voltage produced by each pair of metals (volts)			
	magnesium	zinc	iron	copper
copper	1.7	0.9	0.8	0
iron	1.3	0.1	0	-
zinc	0.8	0	-	-
magnesium	0	-	-	-

Which pair of metals made the cell with the biggest voltage?

_____ and _____

11d

1 mark

(e) Look at the results in the table above.

Why should the pupils **not** use pairs of the same type of metal for the clock?

_____

_____

11e

1 mark

maximum 5 marks

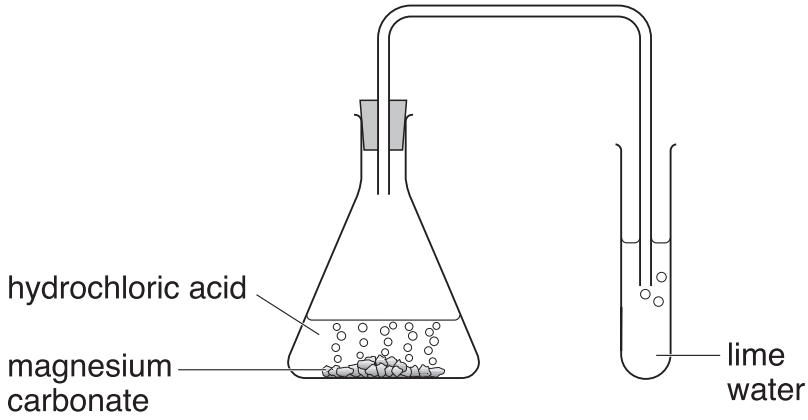
Total

5

12. The word equation for the reaction between magnesium carbonate and hydrochloric acid is shown below.

magnesium carbonate + hydrochloric acid → magnesium chloride + carbon dioxide + water

(a) Sadiq added hydrochloric acid to magnesium carbonate in a flask.



(i) Suggest the pH of hydrochloric acid.

_____

12ai

1 mark

(ii) The carbon dioxide produced was bubbled through lime water.

How would the lime water change?

_____

12aii

1 mark

(b) Sadiq repeated the experiment by adding **sulphuric acid** to magnesium carbonate.

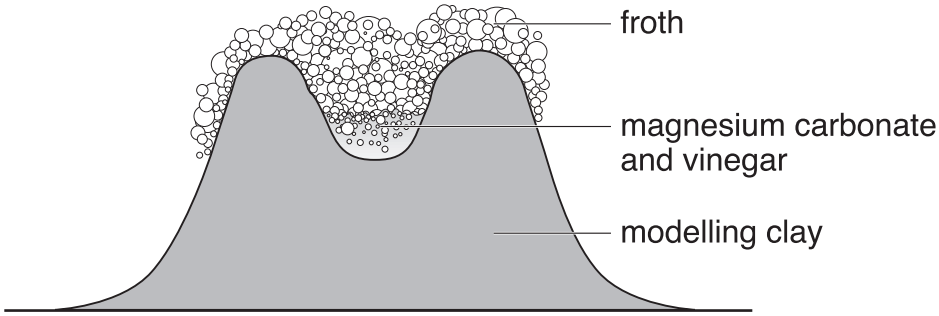
Complete the word equation for the reaction that took place.

magnesium carbonate + sulphuric acid → _____ + carbon dioxide + water

12b

1 mark

(c) Sadiq made a model volcano.
He put magnesium carbonate into the model.
He added vinegar and a drop of washing-up liquid.



The mixture fizzed, and froth poured out of the model volcano.

(i) The vinegar reacted with the magnesium carbonate.

Suggest the pH of vinegar.

_____

12ci

1 mark

(ii) The froth running down the side of the model represents part of a real volcano.
Give the name of this part.

_____

12cii

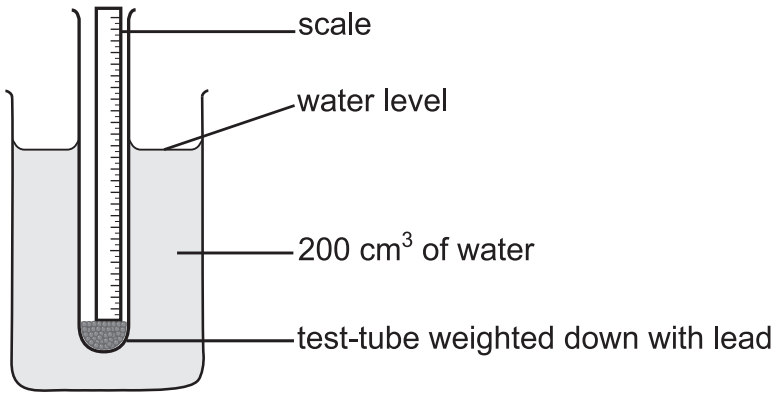
1 mark

maximum 5 marks

Total

5

13. Abi investigated how adding salt to water affects the way an object floats. She used the apparatus below.



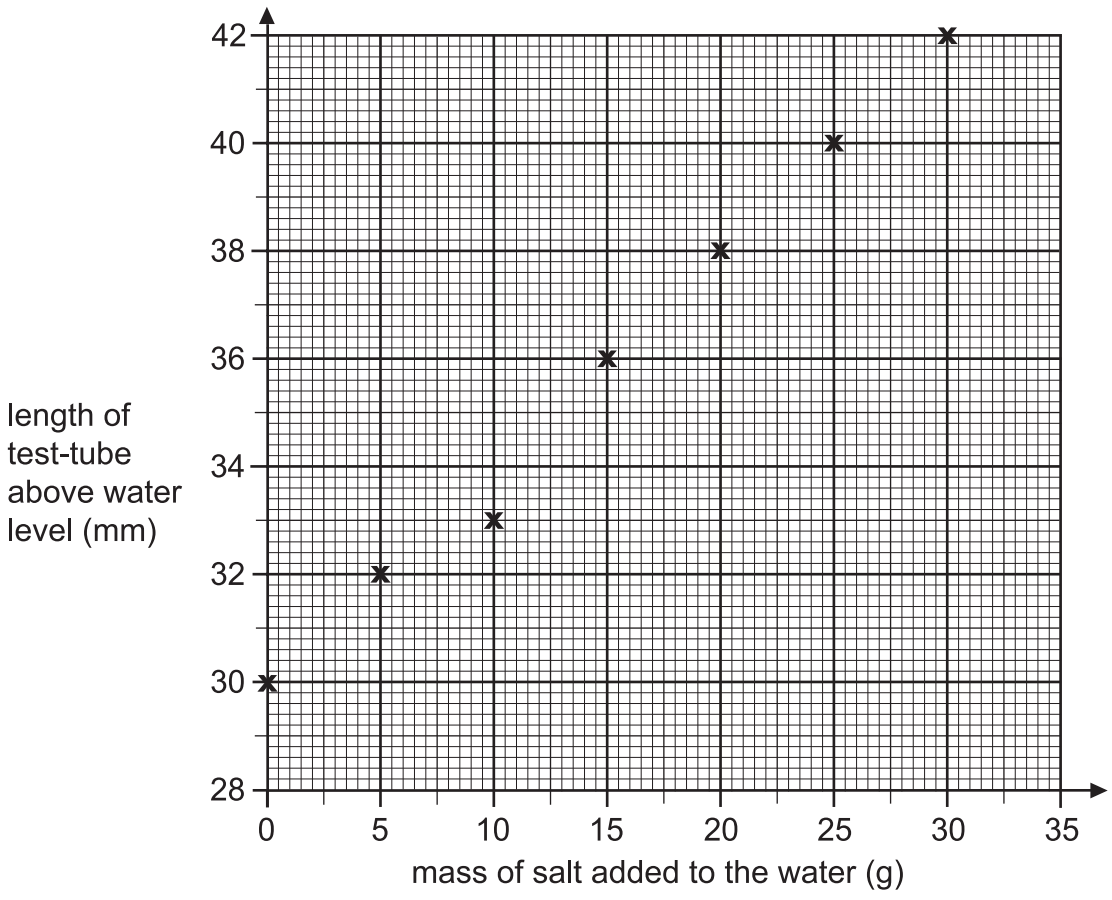
She used a scale inside a test-tube to measure the length of the test-tube above the water level.

(a) What factor did Abi change as she carried out her investigation (the independent variable)?

13a

1 mark

(b) Abi plotted her results on a graph.



(i) **On the graph**, circle the result which does **not** fit the pattern.

13bi

1 mark

(ii) Suggest **one** reason for this result.

_____

_____

13bii

1 mark

(c) Abi said she should repeat the measurement that does **not** fit the pattern.
Robert said there is **no** need to repeat this measurement.

Who do you agree with?
Tick **one** box.

Abi ☐ Robert ☐

Explain your answer.

_____

_____

_____

13c

1 mark

(d) Abi and Robert wrote the conclusions listed below.

Look at the graph of their results and tick whether each conclusion is **true** or **false** or whether you **cannot tell**.

conclusions	true	false	cannot tell
The more salt added, the higher the test-tube floats in the water.	☐	☐	☐
The length of the test-tube is 8 cm.	☐	☐	☐
When 10 g of salt is added, the length of the test-tube above the water will be 34 mm.	☐	☐	☐
Doubling the amount of salt doubles the length of the test-tube above the water.	☐	☐	☐

13d

1 mark

13d

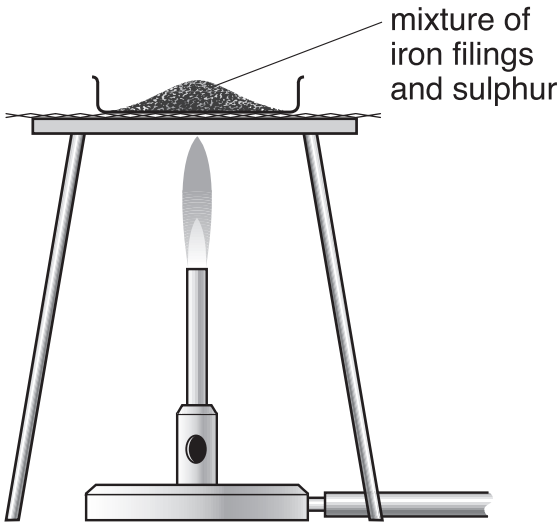
1 mark

maximum 6 marks

Total

6

14. A teacher mixed iron filings with sulphur on a metal tray.
She heated the mixture in a fume cupboard.
Sulphur is yellow. Iron filings are grey.



The mixture glowed very brightly. The teacher turned off the bunsen burner.
The glow spread through the mixture.
When the mixture cooled, a black solid called iron sulphide was left.

(a) From this information, give **one** way you can tell that a chemical reaction took place.

_____

_____

14a
1 mark

(b) What type of substance is each of the chemicals involved in this reaction?
Choose from:

metallic element	**mixture**	**non-metallic element**	**compound**

iron _____

14b
1 mark

sulphur _____

14b
1 mark

iron sulphide _____

(c) Raj held a magnet near to each of the three chemicals.

By each chemical in the table, write **yes** or **no** to show if the chemical was magnetic.

One has been done for you.

chemical	Was the chemical magnetic?
sulphur	
iron	
iron sulphide	no

14c
1 mark

(d) (i) When iron is heated with sulphur, iron sulphide is formed.
Give the name of the solid formed when **zinc** is heated with sulphur.

_____

14di
1 mark

(ii) Some fossil fuels contain sulphur.
When fuels burn, sulphur reacts with oxygen.

Complete the word equation for this reaction.

sulphur + oxygen → _____

14dii
1 mark

maximum 6 marks

Total
6

15. **Table 1** gives information about 100 g of five different foods.

food	energy per 100 g of food (kJ)	nutrients per 100 g of each food			
		protein (g)	fat (g)	carbohydrate (g)	calcium (mg)
banana	403	1.2	0.3	23.2	6
wholemeal bread	914	9.2	2.5	41.6	54
butter	3031	0.5	81.7	0	15
cheese	1708	22.5	34.4	0.1	720
milk	275	3.2	3.9	4.8	115

table 1

(a) Look at **table 1**.

(i) Which of the four **nutrients**, protein, fat, carbohydrate or calcium, provides most of the energy in the cheese?

_____

15ai

1 mark

(ii) Which of the four **nutrients** provides most of the energy in the wholemeal bread?

_____

15aii

1 mark

(iii) Which of the four **nutrients** is needed for growth and repair?

_____

15aiii

1 mark

(b) The recommended daily amount of protein for a woman is 45 g.
Look at **table 1**.
How many grams of cheese would provide 45 g of protein?
Tick the correct box.

50 g ☐ 100 g ☐ 150 g ☐ 200 g ☐

15b

1 mark

(c) **Not** all the types of nutrients needed for a balanced diet are shown in **table 1**.

Give the name of **one** of the missing types of nutrient.

_____

15c

1 mark

(d) **Table 2** shows the recommended daily amount of calcium for a person in four stages of the human life cycle.
We need calcium for healthy teeth and bones.

person	recommended daily amount of calcium (mg)
a baby aged 6 months	600
a woman before she is pregnant	500
a pregnant woman	1200
a breast-feeding woman	

table 2

(i) Use information in **table 2** to estimate how much calcium a breast-feeding woman should have each day.

_____ mg

15di

1 mark

(ii) Explain why she would need this amount of calcium.

_____

_____

15dii

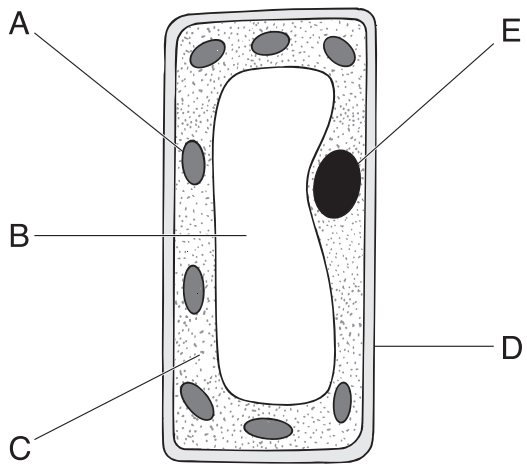
1 mark

maximum 7 marks

Total

7

16. The diagram shows a plant cell.



(a) Give the name of part A.

_____

Give the function of part A.

_____

_____

16a
1 mark

(b) Give the name of part E.

_____

Give the function of part E.

_____

_____

16a
1 mark

16b
1 mark

16b
1 mark

(c) Give the letters of **two** parts that are present in plant cells but **not** in animal cells.

_____ and _____

16c

1 mark

(d) How can you tell that the cell on the opposite page is from a leaf and **not** from a root?

_____

16d

1 mark

END OF TEST

maximum 6 marks

Total

6

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QCA/06/2790 (Mark scheme pack)
275652