Charterhouse 13+ 2004

Key Stage 3 1994

SCIENCE

Tier 3-6

Paper 1

Please read this page, but do not open the booklet until your teacher tells you to start.

Write your name, school and teaching group in the spaces below.

Name _____

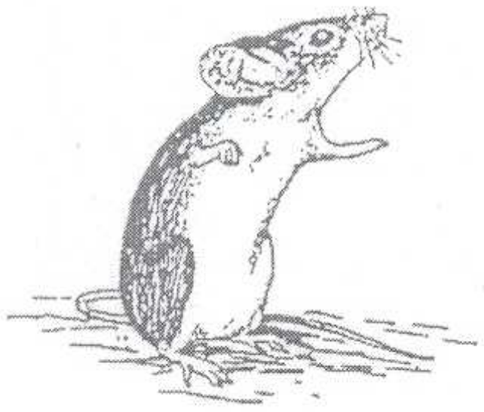
School _____

Teaching Group Number ☐ **Total Marks** ☐

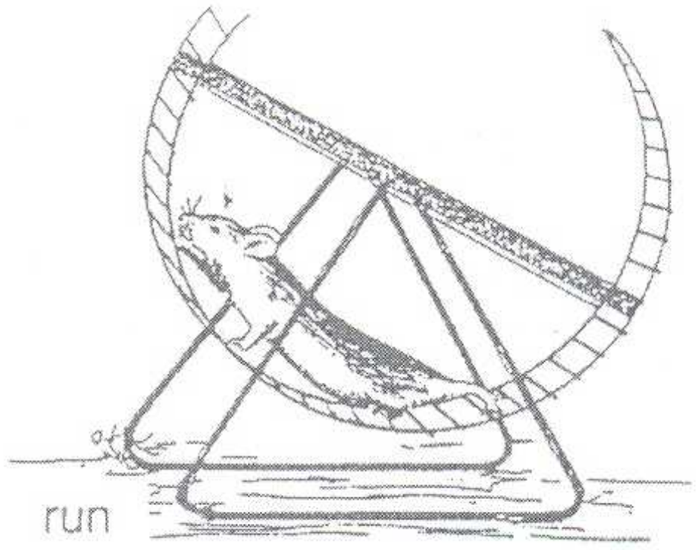
Remember

- The test is 1 hour long.
- You will need a pen, a pencil, a rubber, a ruler and a calculator.
- The first part of this paper has questions on levels 3 and 4.
  The second part has questions on levels 5 and 6.
- Try to answer all of the questions. If you find a question too hard, go on to the next question.
- Write all your answers in the booklet. Do not use any rough paper.
- Check your work carefully.
- Ask your teacher if you are not sure what to do.

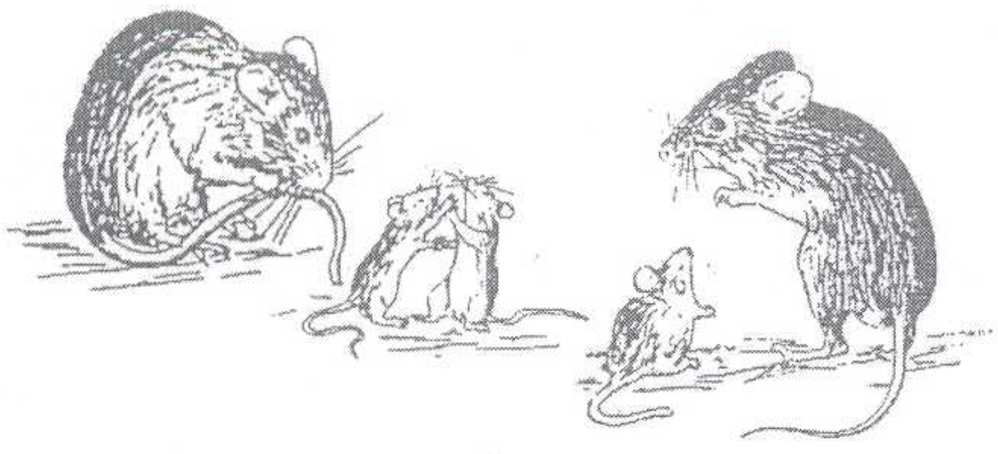
1. Mice are animals. The drawings show some of the things which mice do.



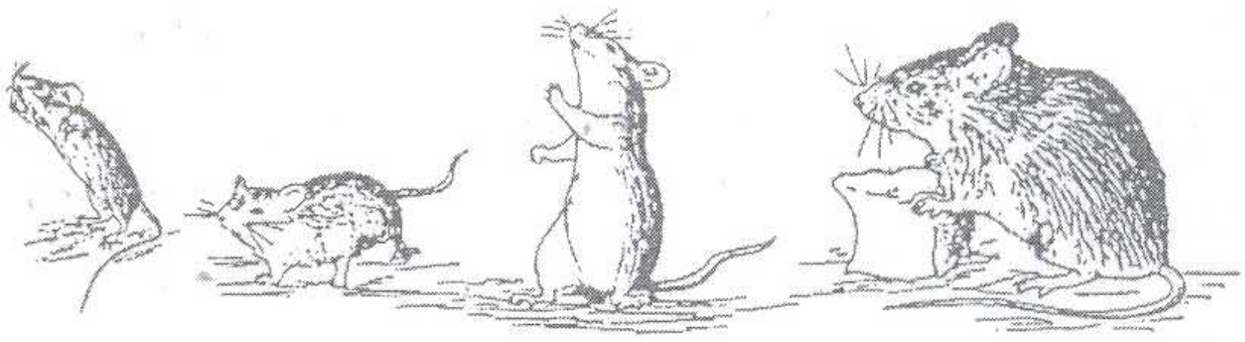
sit



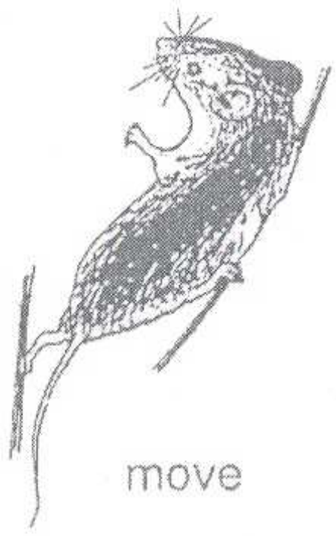
run



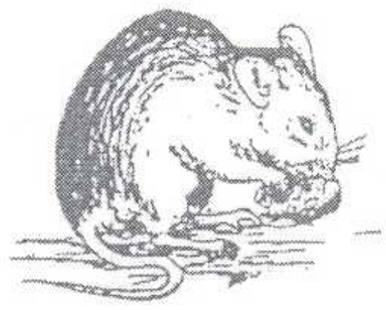
reproduce



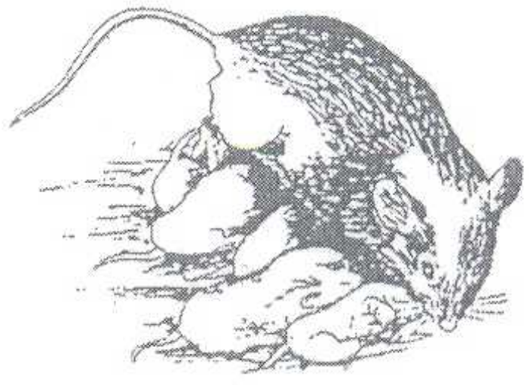
grow



move



feed



feed their young

Goldfish are also animals.

Tick the boxes by **four** things which **both** mice and goldfish do.

Tick **only** four boxes.

4 marks

feed ☐

run ☐

reproduce ☐

sit ☐

feed their young ☐

move ☐

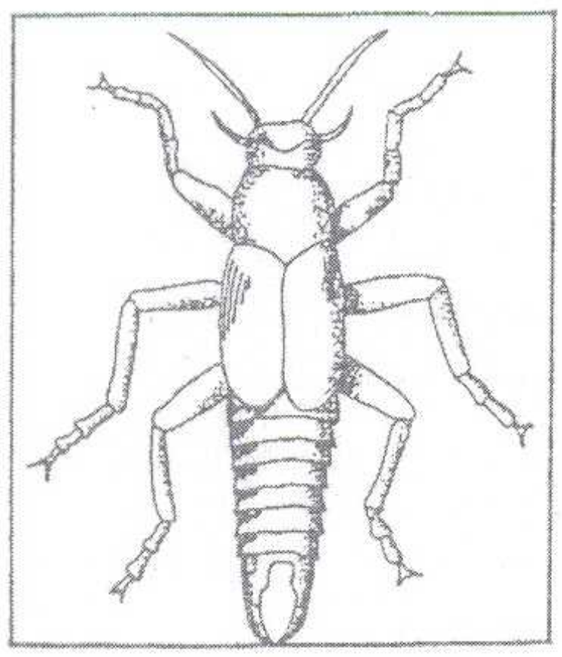
grow ☐

maximum 4 marks ☐

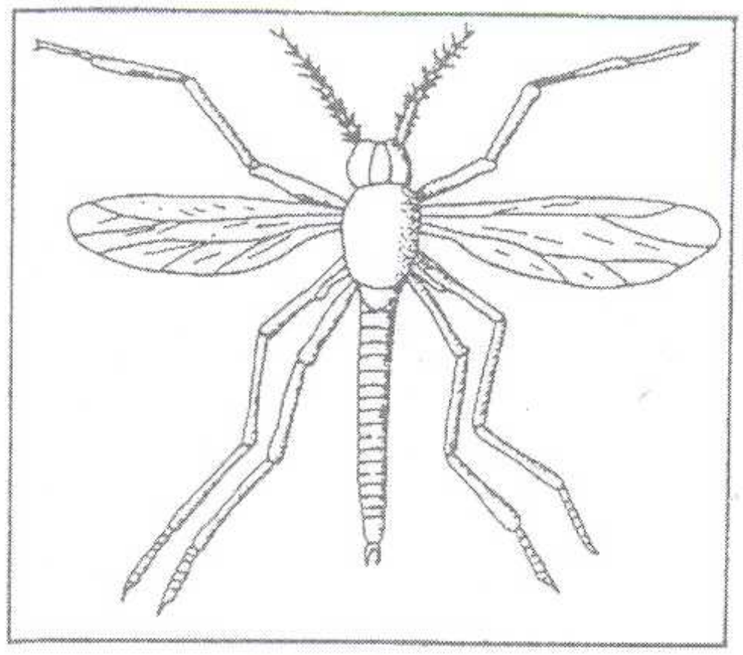
2/3a

2. The animals in the drawings below all live in a garden.

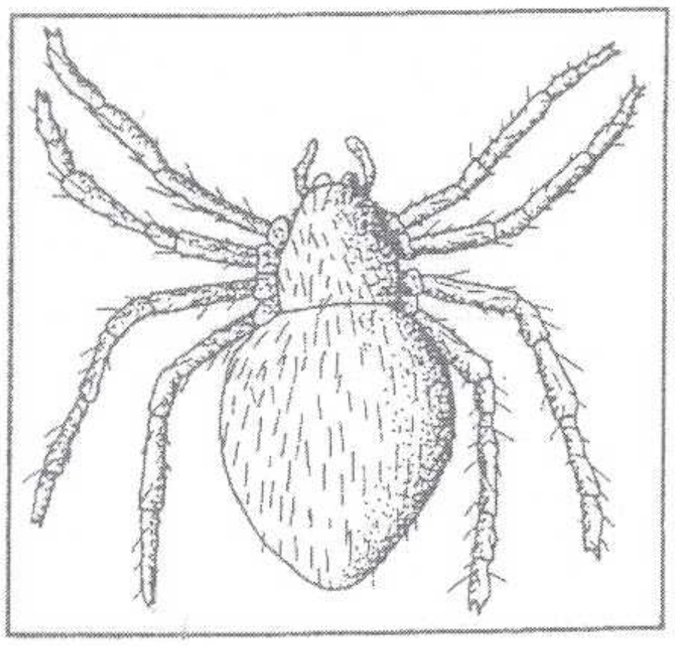
They are not drawn to the same scale.



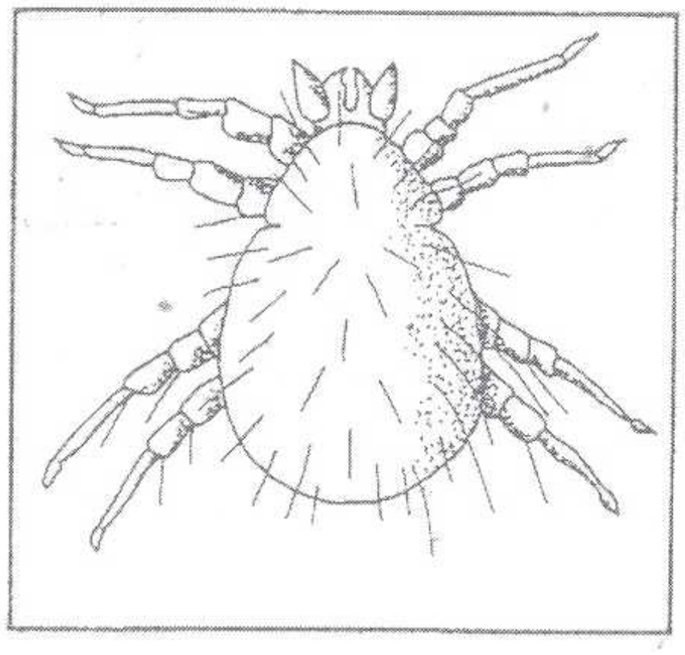
animal A



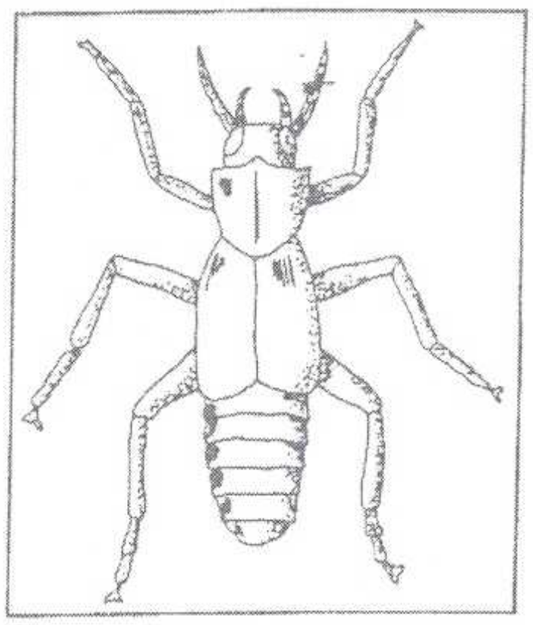
animal B



animal C



animal D



animal E

Look at the pictures on the opposite page.

Use the key to find out the name of each animal. Write your answers on the lines below.

Each time, ask yourself the following questions.

1. Does the animal have six legs?

   yes : go to question 2
   no : go to question 3

2. Does the animal have wings which can be seen clearly?

   yes : mosquito
   no : go to question 4

3. Is the body clearly divided into two main parts?

   yes : spider
   no : mite клещ

4. Are there two pincer-like prongs at the rear end of its body?

   yes : earwig уховертка
   no : beetle

(a) Animal A _____ *1 mark*

(b) Animal B _____ *1 mark*

(c) Animal C _____ *1 mark*

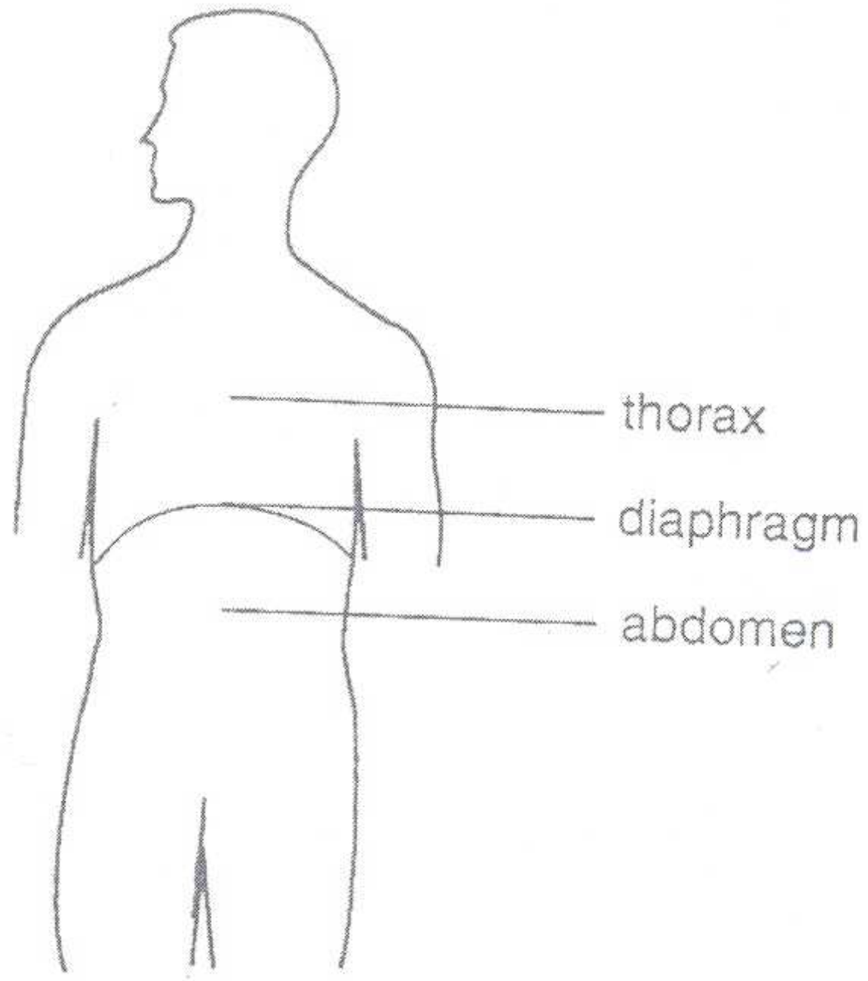
(d) Animal D _____ *1 mark*

(e) Animal E _____ *1 mark*

maximum 5 marks [ ]

2/4b + PoS

3. The drawing shows how the diaphragm divides the space inside the human body into **two** parts: the **abdomen** and the **thorax** (chest).



(a) Complete the table to show where the organs are found.

For each organ, put a tick in the correct column.

5 marks

organ	in the thorax	in the abdomen
heart		
intestines		
liver		
lungs		
stomach		

(b) Name **two** sense organs which are part of the head.

1 mark

1. _____

1 mark

2. _____

(c) Light and sound bring information to your sense organs. Which travels faster, light or sound?

1 mark

_____

maximum 8 marks

2/4a + 4/4d

4. The list gives some of the properties of different materials:

bends and stretches easily	does not bend easily
does not burn	burns easily
is hard	is soft
is magnetic	is not magnetic
sinks in water	floats on water

Complete the sentences with words from the list above.

(a) Steel is used for bridges because it

_____ and _____. *2 marks*

(b) Wool is used for clothing because it

_____ and _____. *2 marks*

maximum 4 marks ☐

3/3a

5. A school's weather station has the following instruments:

анемометр (вітромір)

anemometer **barometer**

weather vane **thermometer**

(a) Which instrument is used to measure:

(i) temperature? _____ *1 mark*

(ii) wind speed? _____ *1 mark*

(b) Draw and label an apparatus used to collect and measure rainfall. *2 marks*

Use this space for your drawing.

A pupil in Wales and a pupil in East Anglia made the following measurements on the same day.

	in Wales	in East Anglia
temperature at noon	12 °C	16 °C
wind speed at noon	30 km/h	10 km/h
rainfall over previous 24 hours	5.0 mm	0.0 mm

(c) Describe **three** differences between the weather in these two regions.

Do **not** just use numbers in your answer.

1 mark

1. _____

_____

1 mark

2. _____

_____

1 mark

3. _____

_____

maximum 7 marks

3/4d + PoS

6. Different fuels can be used in the home.

(a) Draw lines to join each fuel to the appliance in which it is normally used.

3 marks

fuel		appliance
coal	•	• cooker in the kitchen
gas	•	• lawn mower
petrol	•	• open fire in the living room

(b) Give the names of **two** other fuels which can be used for an open fire in the living room. Do **not** give the fuels in the list above.

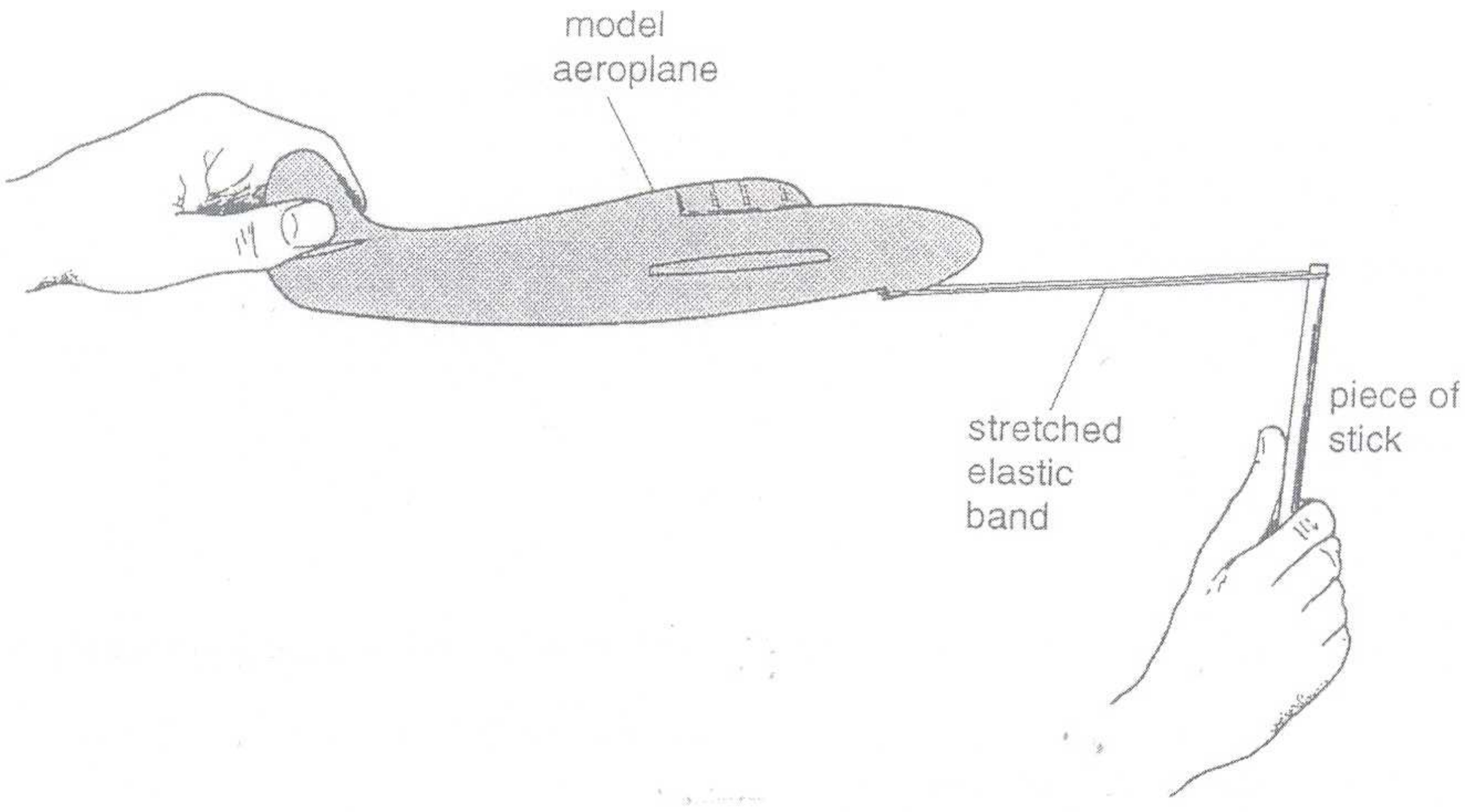
1. _____ *1 mark*

2. _____ *1 mark*

maximum 5 marks [ ]

4/3b

7. Sam is holding a toy aeroplane. Energy is stored in the elastic band.



(a) Give **one** way **more** energy can be stored in the elastic band.

1 mark

_____

_____

_____

(b) Complete the following sentence.

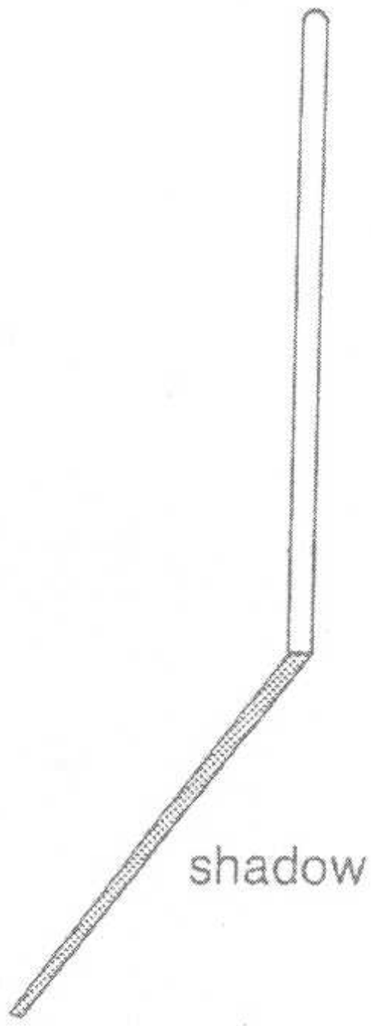
When Sam lets the aeroplane go, stored energy in the elastic band is transferred to _____.

1 mark

maximum 2 marks [ ]

4/4b

8. A class of children investigated the Sun's movement. They used a stick to make a shadow.



They found that when the Sun was higher in the sky, the shadow was shorter.

Use one of the following words to complete each sentence. Words may be used more than once.

longer **shorter** **the same**

On May 1st they measured the length of the shadow at midday. It was 60 cm long.

(a) Earlier in the day, the shadow was

_____ *1 mark*

(b) Later, at 3 o'clock in the afternoon, the shadow was

_____ *1 mark*

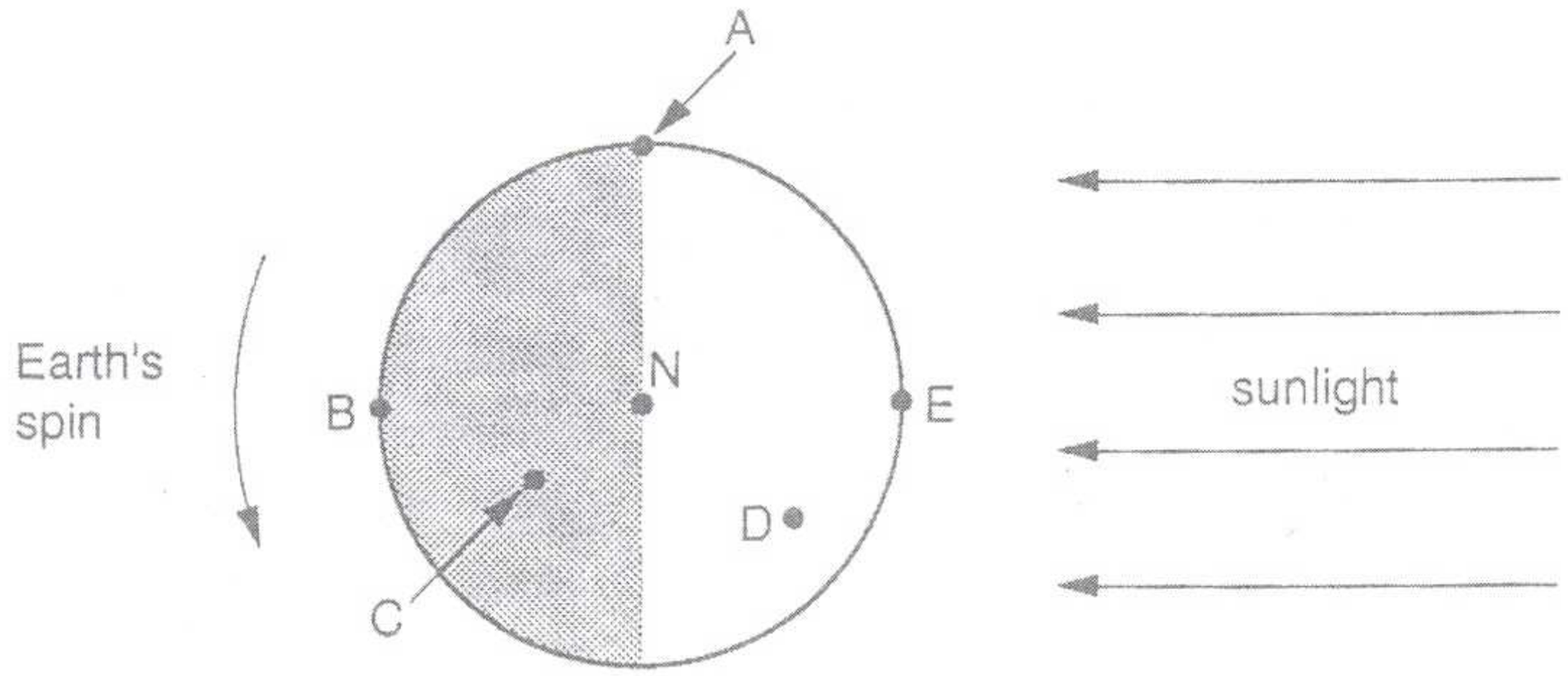
(c) At midday four weeks later, the shadow will be

_____ *1 mark*

maximum 3 marks ☐

4/3e

9. The diagram shows the Earth seen from a satellite above the North Pole. Sunlight is shining on to the Earth.



Five places on the Earth are labelled, **A**, **B**, **C**, **D** and **E**. The North Pole is labelled **N**.

Give the letters of the places described in the table. The first one is done for you.

Letters may be used more than once.

5 marks

description	place
two places in the daytime	**D and E**
(i) one place at noon (midday)	
(ii) one place at midnight	
(iii) one other place at night	
(iv) one place at sunset	
(v) two places from which you can see the stars	

maximum 5 marks

4/4e + PoS

10. A flowering plant has many different parts.

Give **one** function, or job, of each of the following parts.

(a) Leaf

1 mark

(b) Root

1 mark

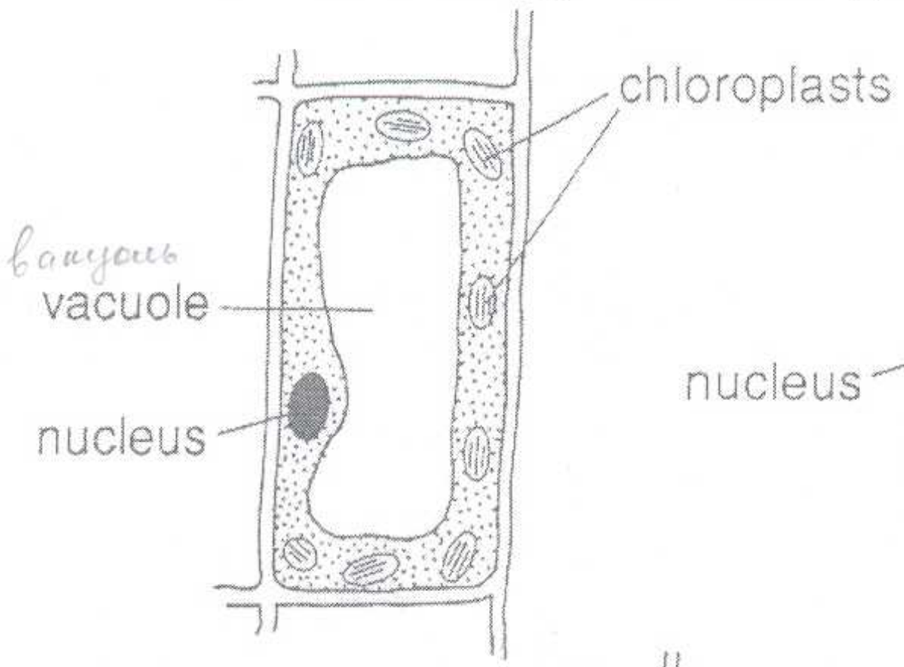
(c) Petal

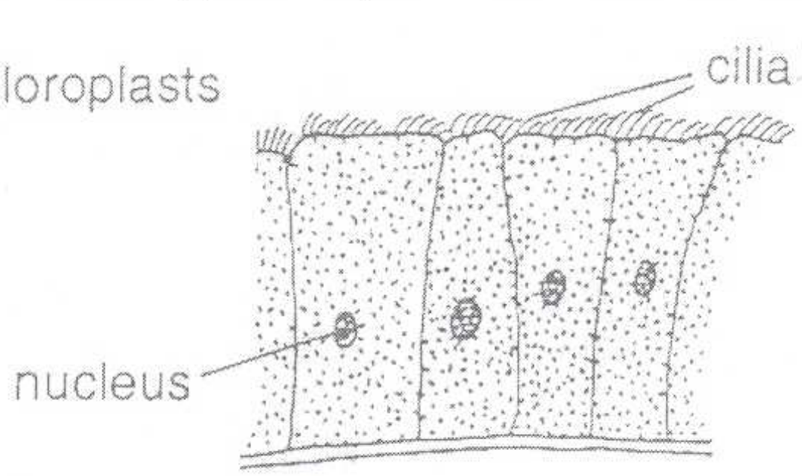
1 mark

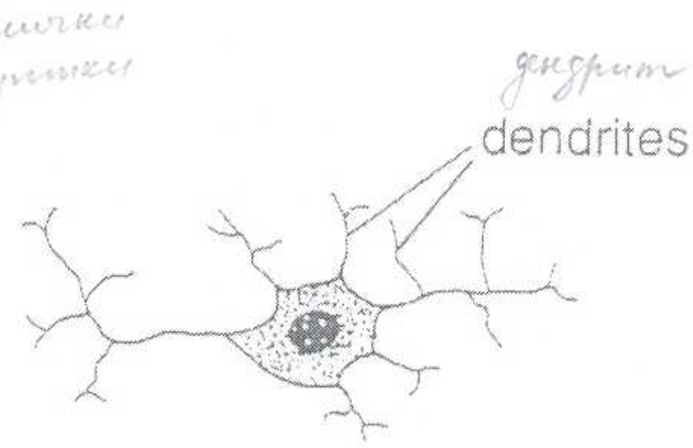
maximum 3 marks

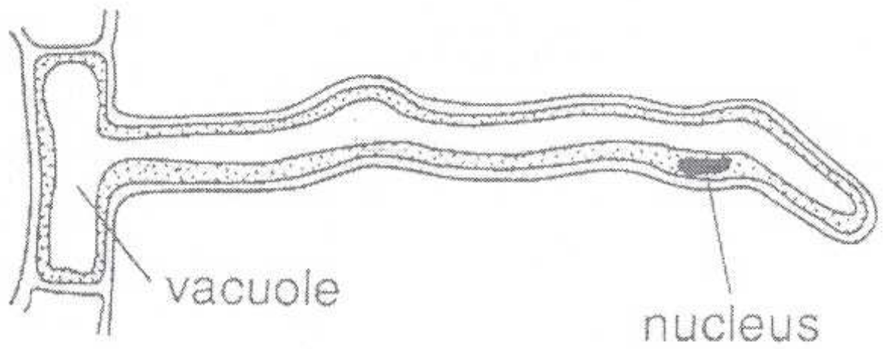
2/5a

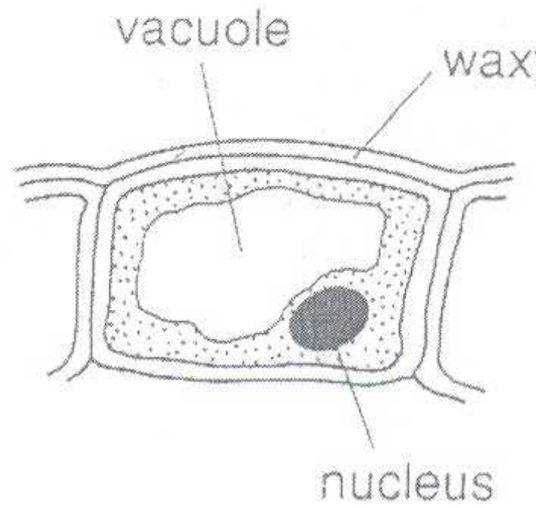
11. The drawings show five types of plant and animal cell.











Each cell has a special feature or structure.

Draw a line to join each feature or structure to its function.

One has been done for you.

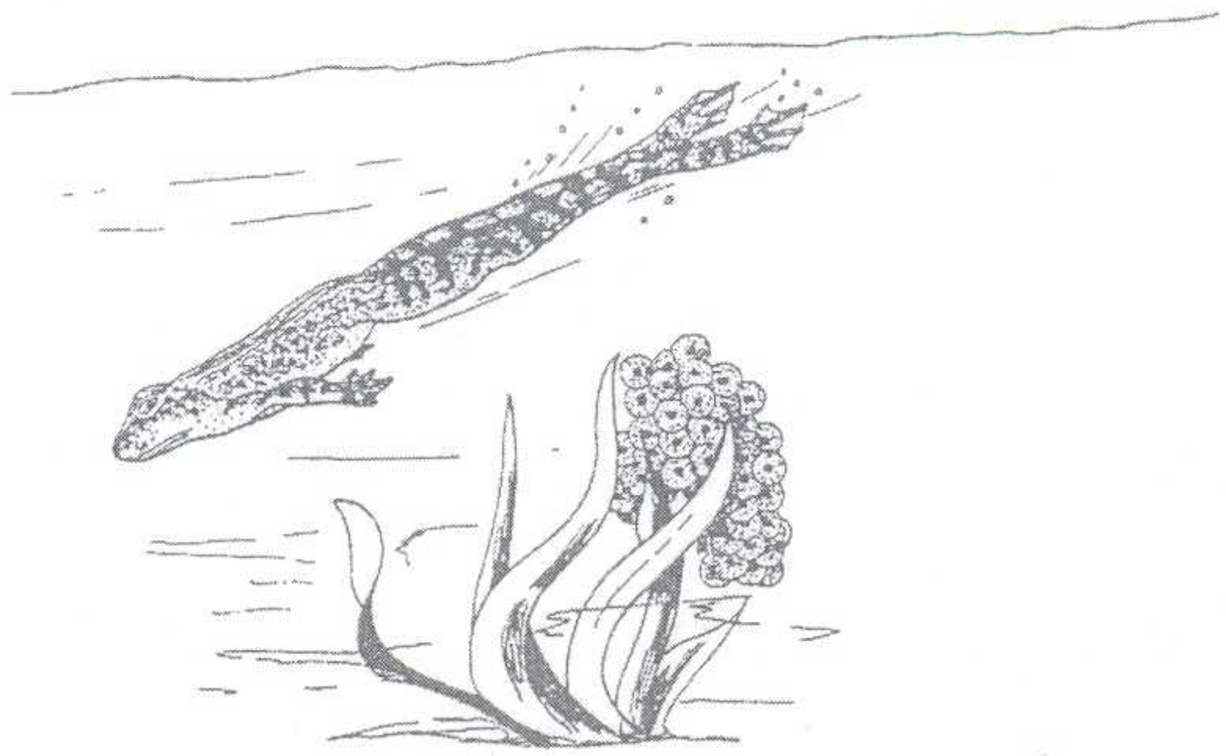
4 marks

feature or structure	function
large surface area	to remove particles from windpipe
chloroplasts	to carry nerve impulses
waxy cuticle	to absorb water from soil
cilia	to make food by photosynthesis
dendrites	to reduce water loss

maximum 4 marks

2/6a

12. The drawing shows a frog swimming.



(a) (i) Describe **two** features, shown in the drawing of the frog, which allow it to move quickly and easily through the water.

1 mark

1. _____

_____

1 mark

2. _____

_____

(ii) Give **two** ways in which being able to swim quickly helps the frog to survive.

1 mark

1. _____

_____

1 mark

2. _____

_____

(b) Large masses of frogs' eggs are laid in water. Each egg is surrounded by a layer of jelly.

Give **one** way in which this might prevent fish eating the frogs' eggs.

1 mark

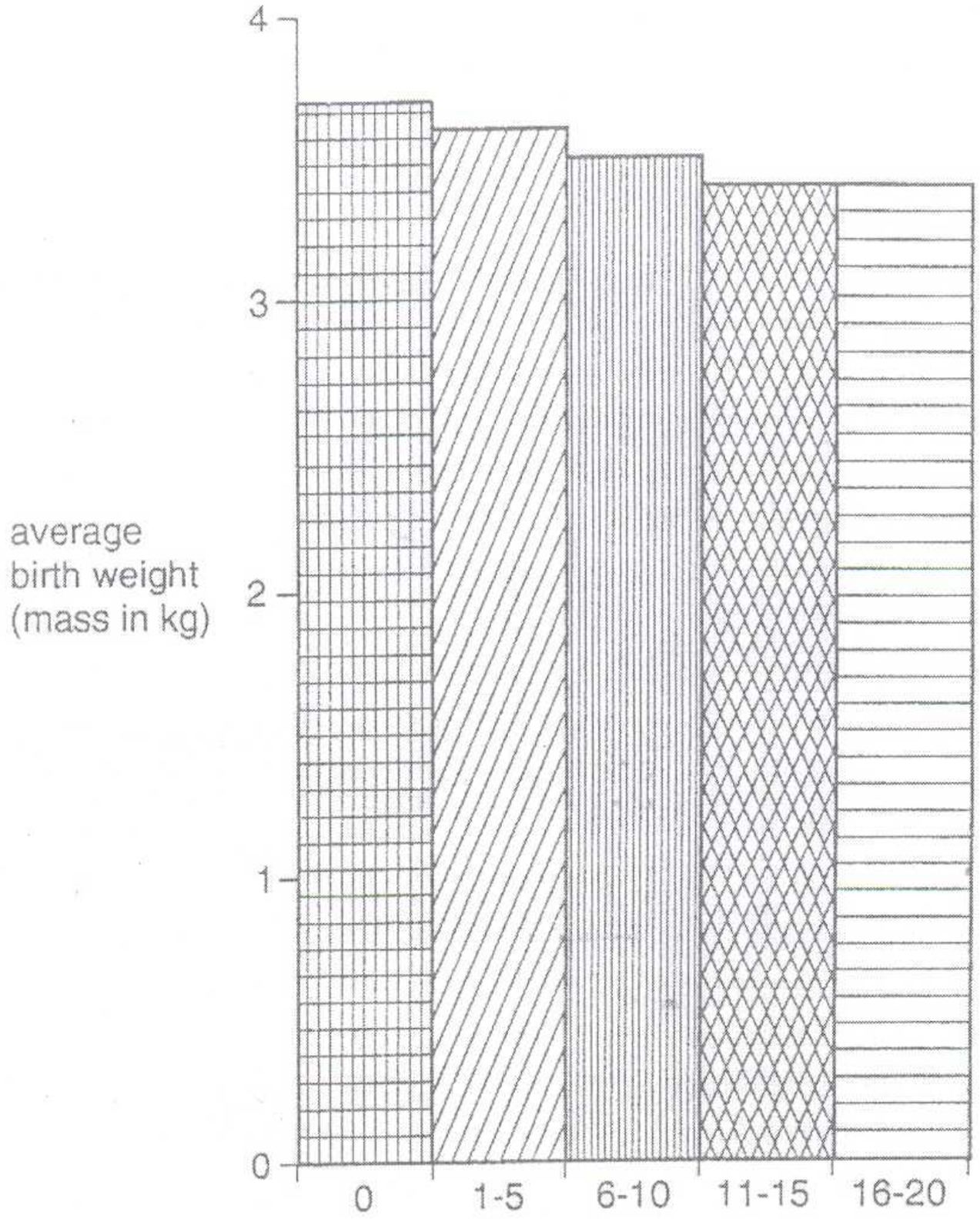
_____

_____

maximum 5 marks

2/6b

13. The bar chart shows the results of a survey of mothers, some of whom smoked cigarettes during pregnancy, and the birth weight of their babies.



(a) From this information state how cigarette smoking by pregnant women affects the birth weight of their babies.

1 mark

_____

_____

(b) Write down **two** other factors that can have this same effect on a baby's birth weight.

1 mark

1. _____

1 mark

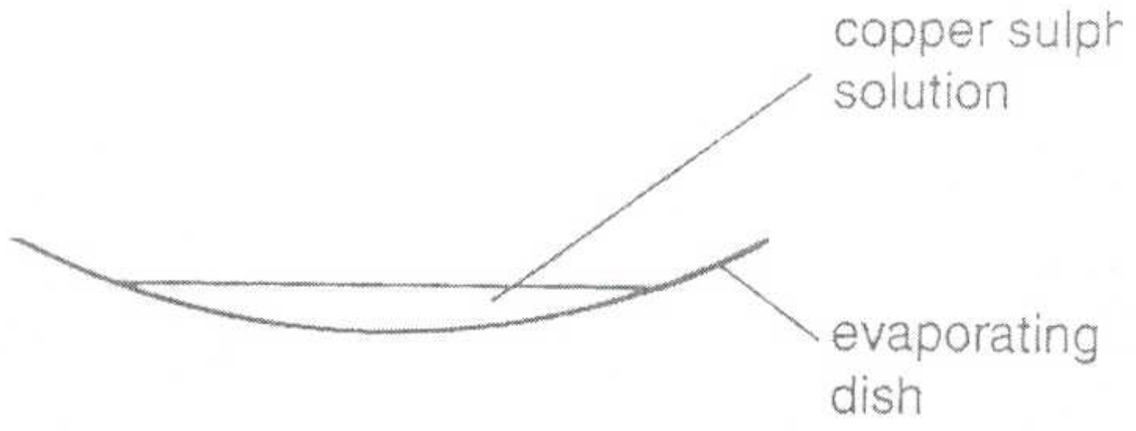
2. _____

maximum 3 marks [ ]

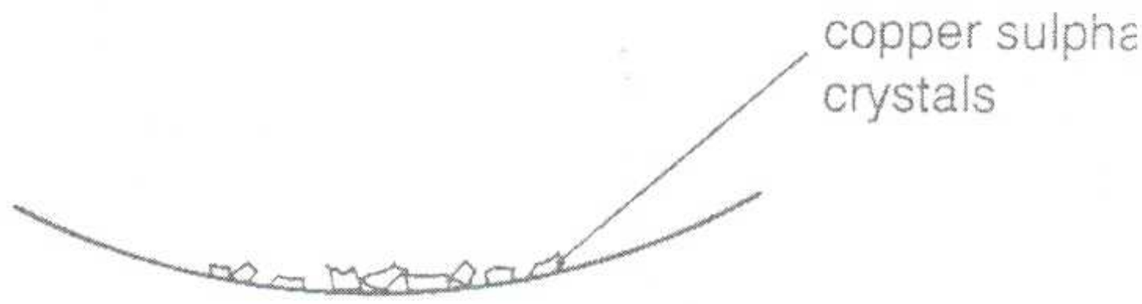
2/6c

14. Three pupils were trying to make copper sulphate crystals from the same copper sulphate solution.

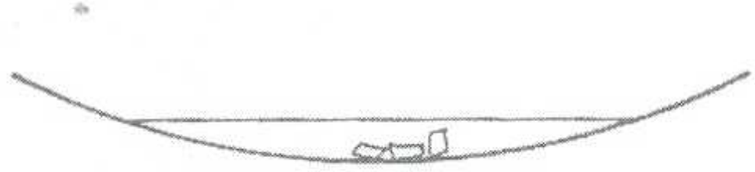
They each poured their solution into an evaporating dish.



Desmond put his evaporating dish near an open window. Next day some crystals had formed and the liquid had gone.



Jane put her evaporating dish in the corner of the laboratory. Next day some of the copper sulphate solution was still left. A few crystals had formed.



(a) Suggest **two** reasons why the water in Desmond's evaporating dish evaporated faster than the water in Jane's.

1 mark

1. _____

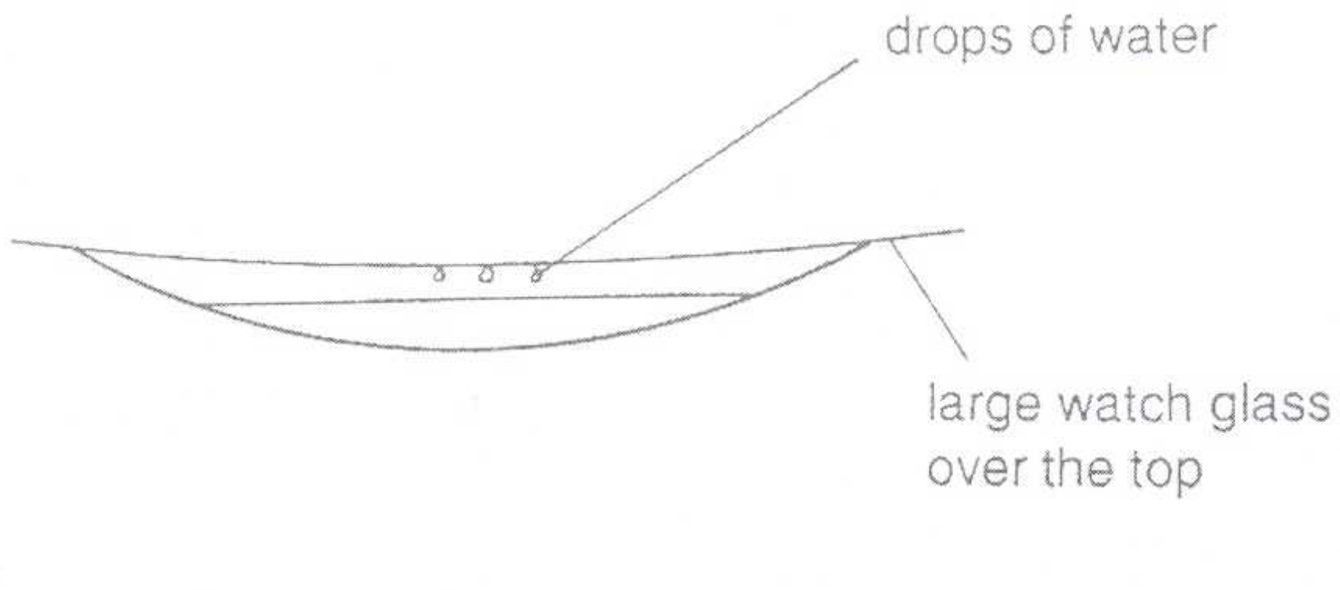
_____

1 mark

2. _____

_____

Sara put her evaporating dish in the corner of the laboratory but covered it with a large cold watch glass. A few minutes later she saw drops of water on the underside of the cover.



(b) Explain how drops of water formed on Sara's glass cover.

2 marks

maximum 4 marks

3/5a + PoS

15. The table gives information about five substances.

substance	colour the substance turns full-range indicator solution	pH of substance in water	reaction of substance with acid
A	red	1	none
B	greenish yellow	8	forms a salt, carbon dioxide and water
C	violet	14	forms a salt and water
D	greenish yellow	8	forms a salt and water
E	yellow	6	none

(a) Which **one** substance, **A, B, C, D or E**:

(i) forms a strongly acidic solution in water? _____ *1 mark*

(ii) forms a strongly alkaline solution in water? _____ *1 mark*

(iii) gives off a gas when it reacts with acid? _____ *1 mark*

Antacids are medicines used to settle an upset stomach. They neutralise the acid in the stomach.

(b) Give **one** reason why substance **C** would **not** be suitable to take to settle an upset stomach.

1 mark

_____

_____

(c) Give **one** reason why substance **D** is better than **B** for settling an upset stomach.

1 mark

_____

_____

maximum 5 marks ☐

3/5b + PoS

16. Compounds are formed when two elements react together. For example, iron chloride is formed when chlorine is passed over heated iron.

Iron filings and sulphur powder were placed in a test tube. The test tube was heated in a fume cupboard until the contents glowed red. The heating was then stopped. However, the chemicals in the test tube continued to glow.

(a) Is the reaction in the test tube endothermic, or exothermic, or is there no energy transfer?

1 mark

(b) Name the new substance formed when iron and sulphur are heated together.

1 mark

(c) Before the iron filings and the sulphur powder are heated, a magnet can separate them. After they are heated, it cannot separate them.

(i) Explain why the magnet **can** separate them before they are heated.

1 mark

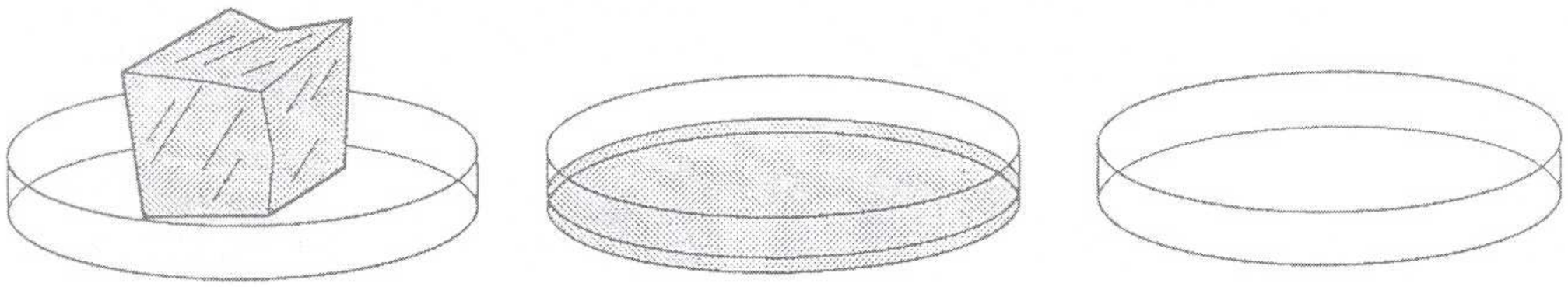
(ii) Explain why the magnet **cannot** separate them after they are heated.

1 mark

maximum 4 marks ☐

3/6e + 3/6a + PoS

17. An ice cube was placed in a dish and left in a warm room.
The following diagram shows the dish at three different times.



10.00 am
A

10.30 am
B

6.30 pm
C

(a) What change of state took place between:

(i) 10.00 am and 10.30 am?

1 mark

(ii) 10.30 am and 6.30 pm?

1 mark

(b) (i) Tick **two** boxes in each vertical column to describe how the particles are arranged in a solid, a liquid and a gas.

3 marks

arrangement of particles	solid	liquid	gas
close together			
far apart			
in a regular pattern			
random			

(ii) Tick **one** box in each column to describe the movement of particles, at room temperature, in a solid and a gas.

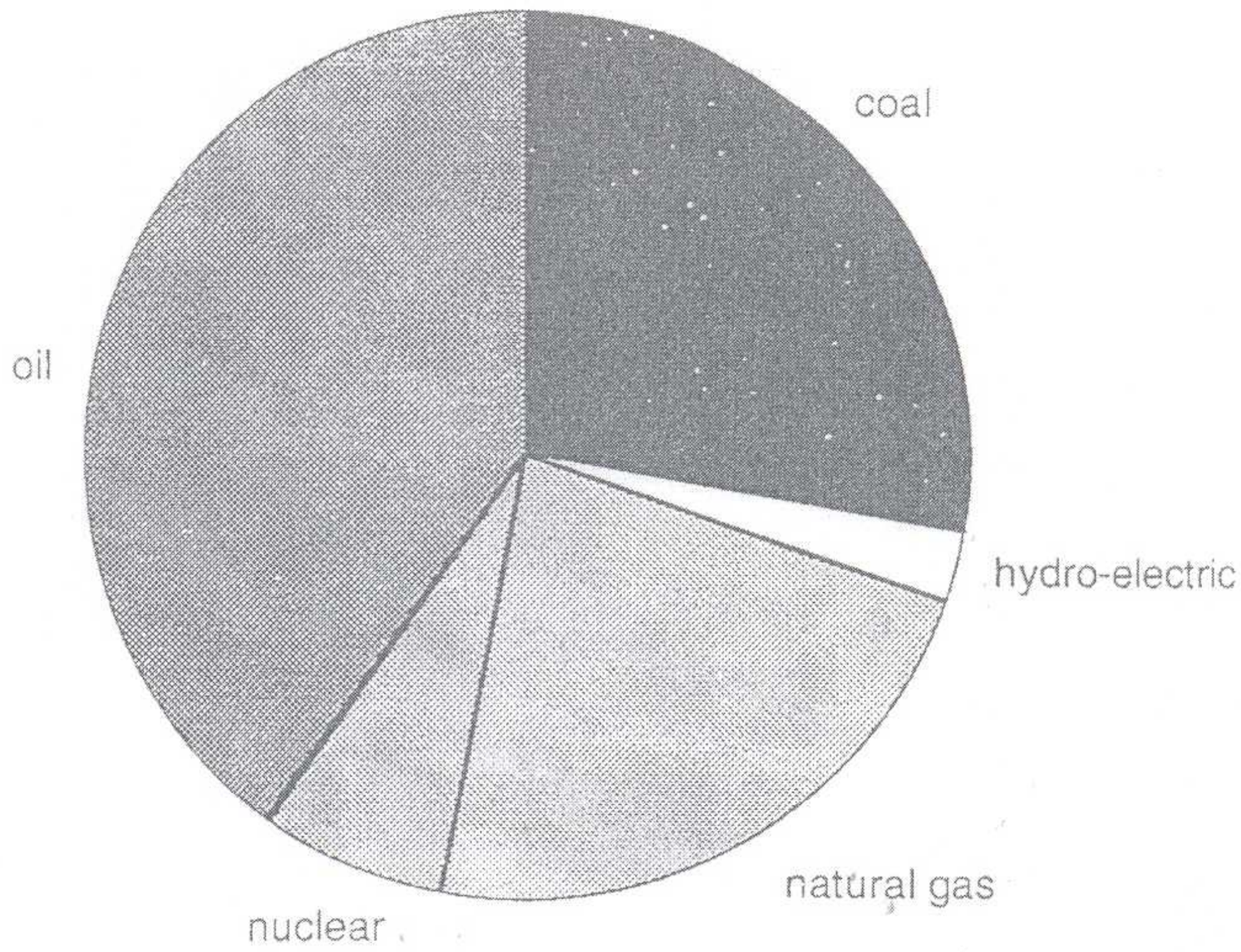
1 mark

movement of particles	solid	gas
move around slowly		
move around quickly		
only vibrate		
do not move		

maximum 6 marks [ ]

3/6b

18. The world's energy needs are supplied by different energy sources. These are shown in the pie chart.



(Source - BP Statistical Review of World Energy, June 1993)

(a) From the pie chart, give **one** example of a renewable and **one** example of a non-renewable source of energy:

1 mark

(i) renewable _____

1 mark

(ii) non-renewable _____

(b) Explain what is meant by a non-renewable source of energy.

1 mark

_____

(c) The following table contains information about three fuels.

fuel	known reserves in 1992 in million tonnes oil equivalent	amount used in 1992 in million tonnes oil equivalent	predicted number of years of known fuel reserves left
coal	1 039 182	4487	232
natural gas	119 148	1839	65
oil	136 500	3170	43

(Source - BP Statistical Review of World Energy, June 1993)

(i) Give **one** reason why numbers in the 'predicted number of years of known fuel reserves left' column may not be very accurate.

1 mark

(ii) Why will the world need to use more renewable energy sources in 40 years' time?

1 mark

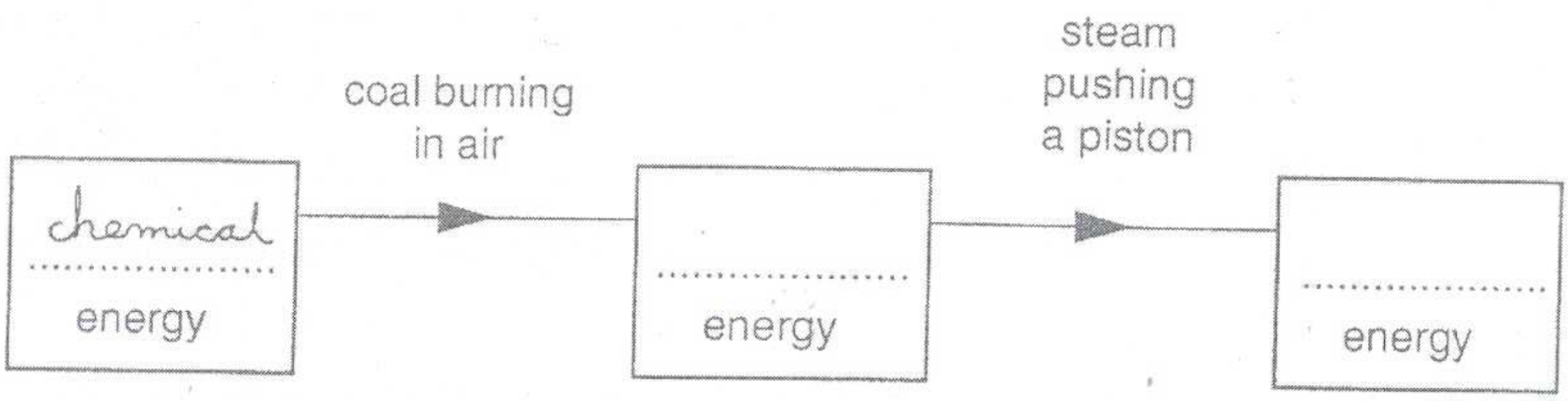
maximum 5 marks 4/5c

19. A steam engine burns coal to boil water and produce steam at high pressure. The steam is used to push a piston in a cylinder. The piston drives the wheels of the engine.

(a) The flow chart below shows the energy transfers in the steam engine. Complete the boxes to show the types of energy at each stage.

The first one has been done for you.

2 marks



(b) The brakes on the wheels of the engine are put on. What energy change now happens in the wheels?

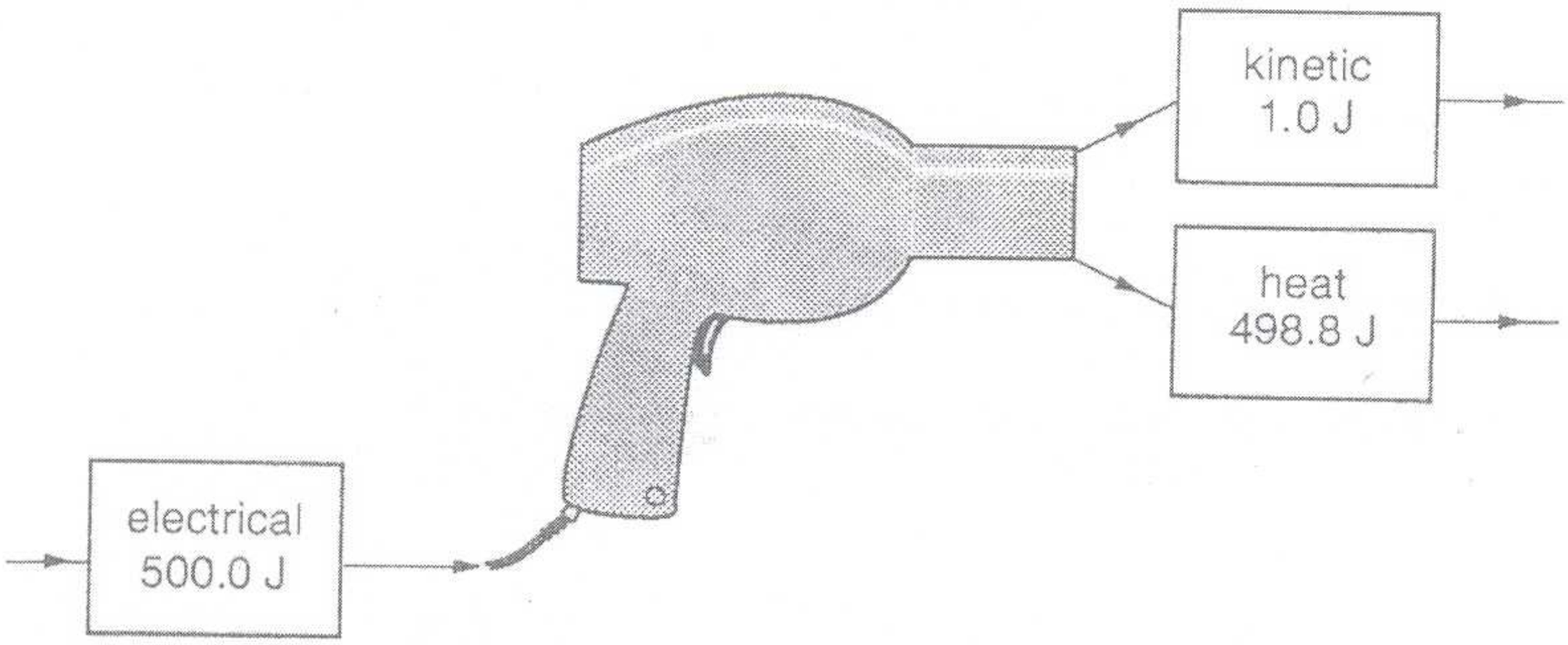
2 marks

_____ changes to _____

maximum 4 marks [ ]

4/5b

20. The diagram shows some of the energy transfers that take place in a hair dryer during the first second after it is turned on.



(a) Not all the energy transfers are shown in the diagram. Explain how you know this.

1 mark

(b) Complete the diagram by adding another labelled box to show the missing energy transfer.

2 marks

maximum 3 marks

4/6b

21. Jupiter can be classified in the following ways:

it is a planet;

it is part of the Solar System;

it is part of the Universe.

This is shown by the ticks in the table.

Complete the table in the same way for:

the Sun **the Milky Way** **the Earth**

3 marks

	Jupiter	the Sun	the Milky Way	the Earth
a star				
a moon				
a planet	✓			
part of the Solar System	✓			
a galaxy				
part of the Universe	✓			

maximum 3 marks ☐

4/6g