



Kāsiga School

Sample Question Paper

English

Mathematics

Science

For admission to class 9 Cambridge

Time: 3 Hrs

Total: 165 marks

ENGLISH

Section A: Reading

Read this magazine article about choices people may consider if they want to select a tree frog as a pet.

The obvious choices when starting out with tree frogs are the large and **placid** White's tree frog, or maybe the iconic red-eyed tree frog for more experienced keepers. However, if you're looking for something more unusual and yet relatively hardy and straightforward to look after, the American green tree frog is well worth **considering**. Captive-bred specimens of this species can often be obtained through exotic pet retailers or specialist breeders, and make charming and delightful *terrarium* subjects.

Originating from the sub-tropical climates of the south-eastern United States, extending from North Carolina through to Florida and Louisiana, this is a bold and gregarious little frog that is typically found in areas of ponds lakes, or in the flood-plain meadows and swamp lands. Slighter and smaller than its European cousin, the American green tree frog is medium-sized, averaging around 3.75 cm in length when fully grown.

It is also a particularly attractive species, usually being a vibrant apple green speckled with tiny white or yellow dots across the back and flanks. The undersides are pale, and a white or cream-coloured lateral band runs from the top jaw along its sides. The colouration of these tree frogs is somewhat changeable, though, and will vary from shades of olive green to deep brown, according to their surroundings and the influence of environmental factors such as heat and humidity.

American tree frogs are mainly nocturnal in nature, meaning they tend to spend most of the day snoozing in their preferred resting spot, hidden amongst the leaves. They then become most active in the evenings and early night-time when they are likely to be heard calling in their **distinctive**, high-pitched and surprisingly loud voices **inflating** their throat pouches as they do so.

GLOSSARY

Terrarium A small container for keeping and observing plants or small animals.

Now answer these questions in the spaces provided.

1 (a) Which tree frog does the writer suggest for an experienced keeper?

..... [1]

(b) What is the difference between an American green tree frog and its European cousin?

..... [1]

2 Give the meaning of each of these words as it is used in the passage. In each case give one word or short phrase.

(a) placid [1]

(b) considering [1]

(c) distinctive [1]

(d) inflating [1]

3 Add the missing punctuation to these sentences.

i would like to buy a tree frog said the customer

are you looking for something unusual asked the pet retailer we have some

interesting captive-bred specimens [2]

4 Re-write this sentence adding a relative clause with further information from the passage.

Green tree frogs live in the United States.

.....
..... [1]

5 Combine these three sentences into **one** complex sentence.
Do **not** use *and* or *but*.

Tree frogs are green.
They make good pets.
They are a particularly attractive species.

..... [1]

6 Complete this sentence, using **two different** forms of the same verb.

When the writer began to keep tree frogs, he the large and placid White's;

now he is more experienced, he the iconic red-eyed tree frog. [1]

7 Read this extract from an autobiography and then answer the questions.

The crumbling wall that surrounded the sunken garden alongside the house was a rich hunting ground for me. There was a whole landscape on this wall if you peered closely enough to see it; the roofs of a hundred tiny toadstools, red, yellow, and brown, showed in patches like villages on the damper portions; mountains of bottle-green moss grew in tufts so symmetrical that they might have been planted and trimmed; forests of small ferns sprouted from cracks in the shady places, drooping languidly like green fountains. The top of the wall was a desert land, too dry for anything except sun bathing by the dragon-flies. At the base of the wall grew a mass of plants, cyclamens, crocus, asphodel, thrusting their leaves among the piles of broken and chipped roof-tiles that lay there. The whole strip was guarded by a labyrinth of blackberry hung, in seasons, with fruit that was plump and juicy and black as ebony.

The inhabitants of the wall were a mixed lot, and they were divided into day and night workers, the hunters and the hunted. At night the hunters were the toads that lived among the brambles, and the geckos pale, translucent with bulging eyes, that lived in the cracks higher up the wall. Their prey was the population of stupid, absent-minded crane-flies that zoomed and barged their way among the leaves; moths of all sizes and shapes, striped, tessellated, checked, spotted and blotched, that fluttered in soft clouds along the withered plaster; the beetles, rotund and neatly clad as business men, hurrying with portly efficiency about their night's work.

(a) List the creatures and where they lived on the wall.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

[6]

Section B: Writing

8 Write an article for a school magazine about owning animals.

You could include **some** of the following in your article:

- the different reasons why people keep animals
- the responsibilities of owning animals – the care and attention they will require
- whether animals should be kept as pets

You may wish to add some of your own experiences of owning an animal or your own opinion about owning animals.

Space for your plan.

A series of 25 horizontal dashed lines for writing.

Mathematics

1 Link the measurement to the most **appropriate** unit.

The first one has been done for you.

grams	litres	millilitres
kilometres	kilograms	metres
cubic centimetres	square centimetres	square metres

- (a) The height of a house is measured in metres.....
- (b) A large jug of water is measured in [1]
- (c) The area of a garden is measured in [1]
- (d) The distance between Tokyo and Kyoto is measured in [1]
- (e) The mass of an elephant is measured in [1]
- (f) The volume of a box is measured in [1]
- (g) The capacity of a teaspoon is measured in [1]

2. In which quadrant does the point lie if

- (a) both numbers of the ordered pair are negative.....
- (b) the x-coordinate of an ordered pair is negative and the y- coordinate is positive.....
- (c) the x-coordinate is 0 and y- coordinate is -5.....
- (d) both numbers of the ordered pair are positive. [2]

3 A box contains 20 computer discs.

(a) $\frac{2}{5}$ of the discs are used.

(i) Write $\frac{2}{5}$ as a decimal.

..... [1]

(ii) Write $\frac{2}{5}$ as a percentage.

..... % [1]

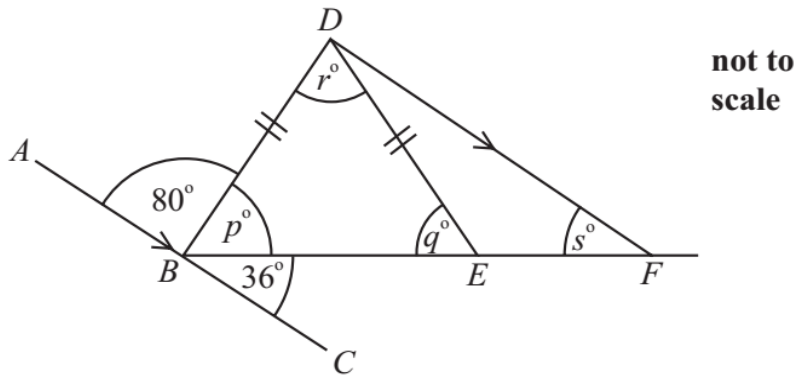
(iii) Work out how many discs are used.

..... [1]

(b) 30% of the discs are damaged.

Write this as a fraction in its simplest form.

..... [2]



In the diagram, which is not drawn accurately, ABC is a straight line parallel to DF .
 $BD = DE$.

Work out the size of the angles marked p , q , r , and s .

(a) $p =$ [1]

(b) $q =$ [1]

(c) $r =$ [1]

(d) $s =$ [1]

4.

5 (a) Show that $34 \times 1.2 = 40.8$.

..... [2]

(b) Use part (a) to write down the value of

(i) 3.4×1.2 ,

..... [1]

(ii) 340×0.12 ,

..... [1]

(iii) 17×12 .

..... [1]

6 Find the value of the following expressions when

$r = 4, e = 5$ and $x = 6$.

(a) $5r + 3x + 2e$

..... [1]

(b) $\frac{3re}{x}$

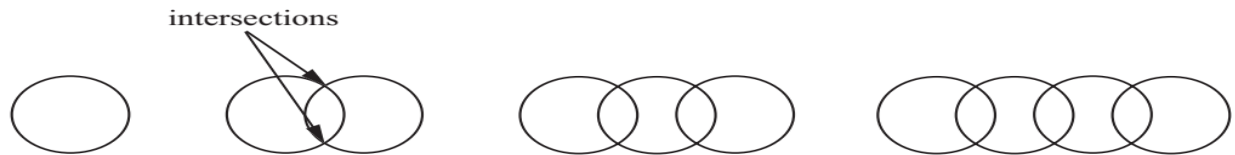
..... [2]

(c) $4e^2$

..... [2]

7. Two opposite angles of a parallelogram are $(3x - 2)^0$ and $(50 - x)^0$. Find the measure of each angle of a parallelogram. [3]

8 Look at this sequence of patterns made by overlapping circles.



Number of circles (c)	1	2	3	4	5
Number of intersections (n)	0	2	4	6	

(a) (i) Complete the table. [1]

(ii) How many circles are there for a pattern with 12 intersections?

..... [1]

(iii) Underline the formula which describes this sequence.

$n = c - 1$ $n = 2c - 2$ $n = 3c - 5$ $n = 4c - 6$ [1]

(b) A different sequence uses the formula $m = 3d - 2$.

Use this formula to work out the value of

(i) m when $d = 5$,

..... [1]

(ii) d when $m = 43$.

..... [1]

9 (a) Remove the brackets and simplify

(i) $3(4x + 5)$,

..... [1]

(ii) $12 - 2(3y - 2)$.

..... [2]

(b) Factorise

(i) $3x^2 - 15$,

..... [1]

(ii) $4ab^2 + 6ab$.

..... [2]

10. Kiran is 24 years older than Rakesh. 10 years back Kiran's age was five times the age of Rakesh. Find their ages. [3]

11. A closed cylinder has a circular base of circumference of 44cm and height 30 cm. Find the volume and the surface area of the cylinder. [3]

12. A die is tossed once. What is the probability

[1]

(a) of the number '7' coming up ?

(b) of a number 'less than 7' coming up ?

13. Find the quotient on dividing: $(21x^2y - 14xy + 7xy^2)$ by $7xy$.

[2]

SCIENCE

All questions are compulsory.

No additional sheets will be provided. All rough work to be done in the blank spaces on this paper.

- 1 Litmus is made from a plant pigment.
It is **red** when placed in an **acidic** solution.
It is **blue** when placed in an **alkaline** solution.
It is **purple** when neutral.

(a) What do we call substances that change colour like this?

..... [1]

(b) What colour would litmus be in a solution of pH 10?

..... [1]

(c) What colour would you expect litmus to be in pure water?

..... [1]

(d) Excess acid in the stomach can cause indigestion.

What would be the safest thing to neutralise excess acid in the stomach?
Tick (✓) the correct box.

vinegar (acid)

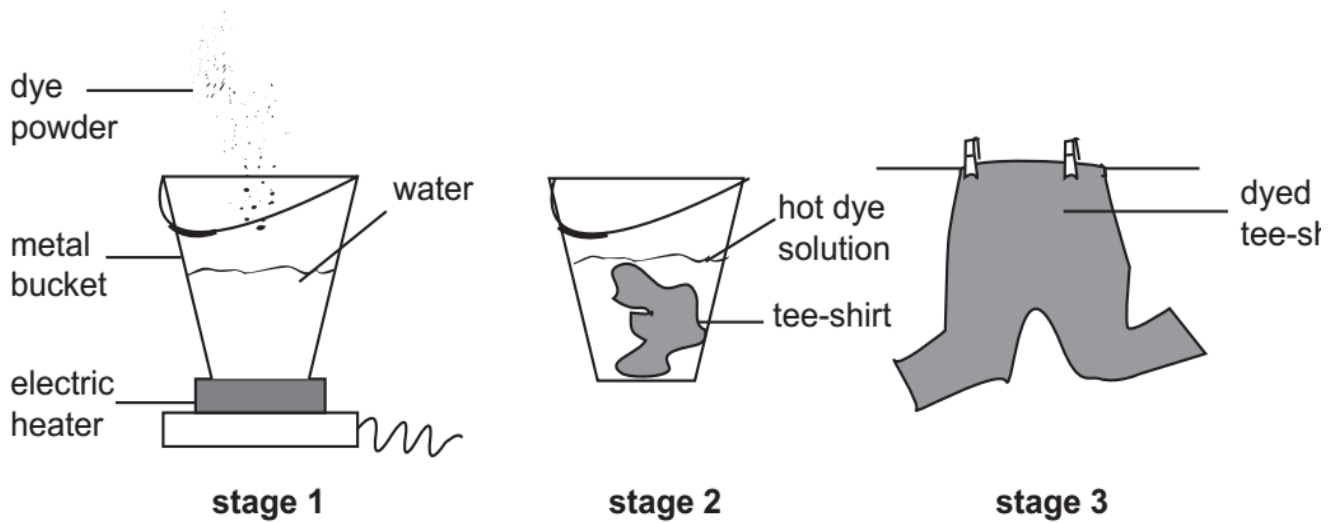
salt water (neutral)

sodium hydrogencarbonate (mild alkali)

caustic soda (strong alkali)

[1]

2 A student uses a dye to change the colour of his tee-shirt.



(a) Why is a metal bucket more suitable than a plastic bucket?

..... [1]

(b) When the bucket is heated, what happens to the movement of the particles in the metal?

..... [1]

(c) The dyed tee-shirt is hung up to dry in a warm room. What physical change happens to the water from the dye solution?

..... [1]

3 (a) The pictures show four different birds.



Use the key to identify birds **X** and **Y**.

1	curved beak	go to 2
	straight beak	oystercatcher

2	beak curved upwards	avocet
	Beak curved downwards	go to 3

3	stripe above eye	whimbrel
	no stripe above eye	curlew

X is

Y is [2]

(b) All the pictures in (a) show animals which belong to the same group (birds).

Three features of birds are

- they have feathers,**
- they lay eggs,**
- they have a backbone.**

(i) Which feature is unique to birds (that is, which feature is not shared with other groups)?

..... [1]

(ii) Which feature do birds have in common with all other vertebrates?

..... [1]

4 Plants and green algae need mineral salts to grow.

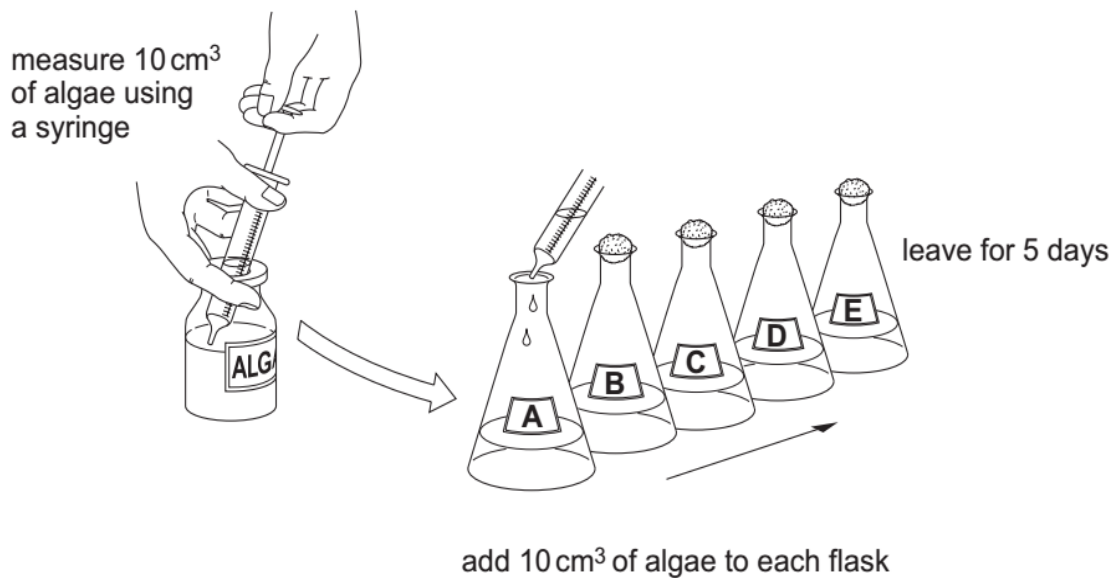
One mineral salt is magnesium sulfate.



Ahmed and Safia investigate the growth of algae.

They put different concentrations of magnesium sulfate solution into five flasks, **A**, **B**, **C**, **D** and **E**.

They then add the algae.



(a) Why did Ahmed and Safia put 10 cm³ of algae into **each** flask?

..... [1]

(b) Why did they leave the flasks for 5 days?

..... [1]

(c) Here are their results.

flask	concentration of magnesium sulfate (1 = dilute, 5 = most concentrated)	colour of algae (1 = light green, 10 = dark green)
A	1	4
B	2	5
C	3	8
D	4	10
E	5	1

Complete the sentence to describe the pattern of their results.

As the concentration of magnesium sulfate increases from 1 to 5, the colour of the algae

.....
..... [2]

(d) When the colour of the algae is dark green it has grown the most.

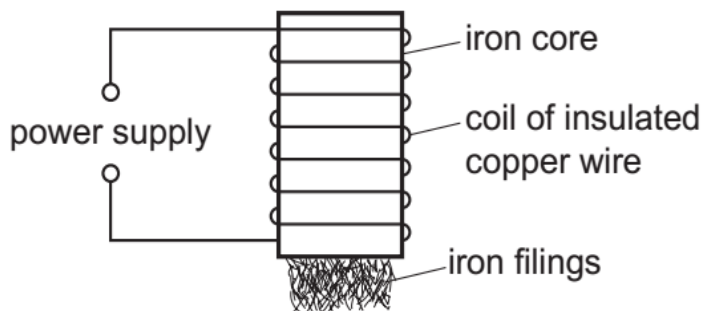
Complete the sentence.

Choose a word from the list.

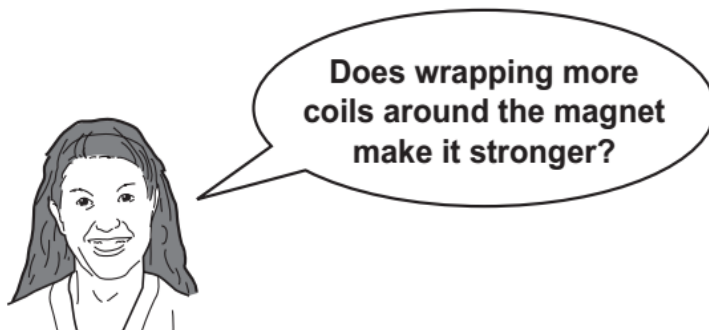
carbon dioxide fastest the same slowest sugar water

When the concentration of magnesium sulfate is 4 the algae grow [1]

5 Sam and Shakira make an electromagnet as shown.

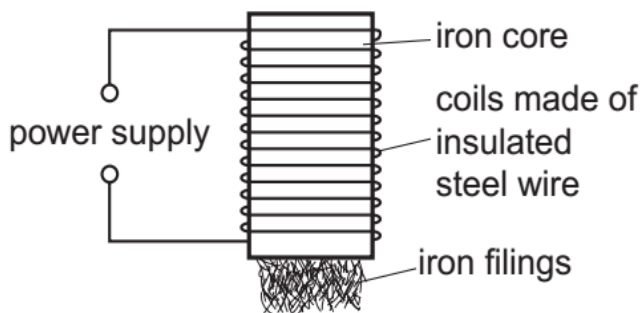


Their teacher asks them to plan an experiment to answer this question.

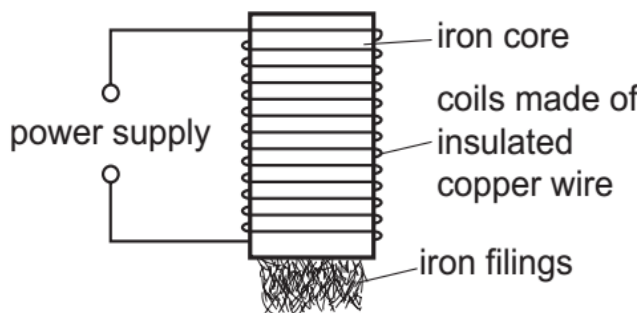


She tells them that they can test the strength of their magnets by measuring the mass of iron filings that they pick up.

The diagram shows the changes that Sam and Shakira make to their magnets when they begin their experiment.



Sam



Shakira

(a) Explain why Sam's experiment will **not** answer the teacher's question.

.....
..... [2]

(b) These are the results that Shakira writes down. She writes them in the order that she collects them.

number of coils 5, 10, 15, 20, 25, 30

mass of iron filings in grams 2, 6, 23, 18, 22, 25

(i) In the space, draw a results table and complete it by writing in Shakira's results.

Use a ruler to draw your results chart.

[2]

(ii) Describe the pattern in Shakira's results.

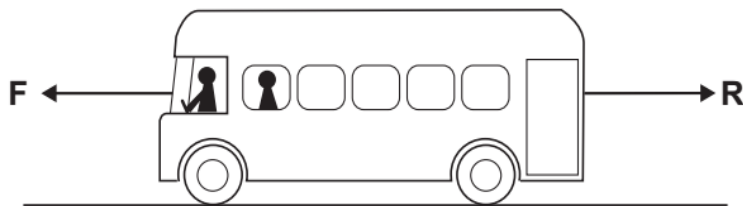
..... [1]

(iii) In your results chart, draw a circle around the result that does **not** fit the pattern. [1]

(iv) Suggest **one** way in which Shakira could make her results more reliable.

..... [1]

- 6 A bus travels along a level road at a constant speed.
The engine produces a force **F** acting against the resistive forces **R**.



- (a) What is the size of the force **F** compared to **R**?
Tick the correct box.

F is larger than **R**.

F is the same as **R**.

F is smaller than **R**.

[1]

- (b) The bus travels a distance of 40 m in 4 s. Calculate its speed. Your answer should include the correct unit.

..... [2]

- (c) A bus engine changes one form of energy into another.

What form of energy is supplied

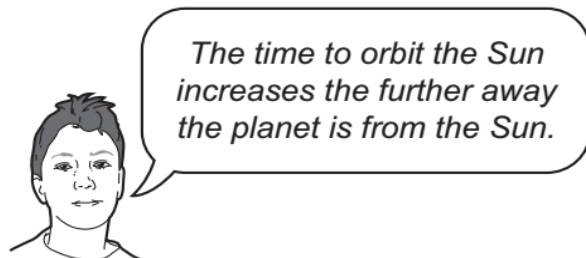
- (i) by the fuel used in the engine,

.....

- (ii) by the battery?

..... [2]

6 Ahmed makes a prediction about the planets in the Solar system.



Prediction 1

To find evidence to support his prediction he uses the internet.

The table shows the information he finds.

planet	relative mass compared to Earth	distance from the Sun in millions of km	average surface temperature in °C	strength of gravity in N/kg	time to orbit the Sun in Earth years
Mercury	0.05	58	169	3.7	0.2
Venus	0.81	108	460	8.9	0.6
Earth	1.00	150	14	9.8	1.0
Mars	0.11	228	63	3.7	1.9

(a) Does the information in the table support **Prediction 1**?

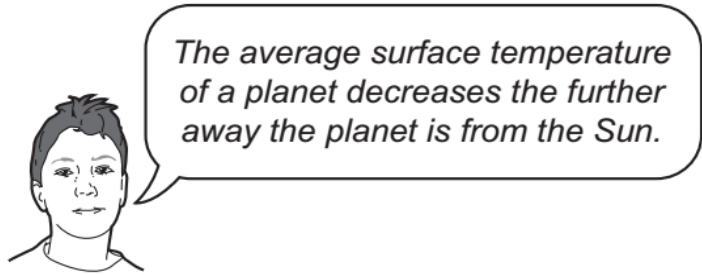
.....

Use information from the table to explain your answer.

.....
.....
.....

[1]

(b) Ahmed makes another prediction.



Prediction 2

(i) Does the information in the table support **Prediction 2**?

.....

Use information from the table to explain your answer.

.....
.....
.....

[2]

(ii) Ahmed thinks he needs more evidence related to **Prediction 2**.

Suggest one **extra** piece of evidence he could use.

.....
.....

[1]

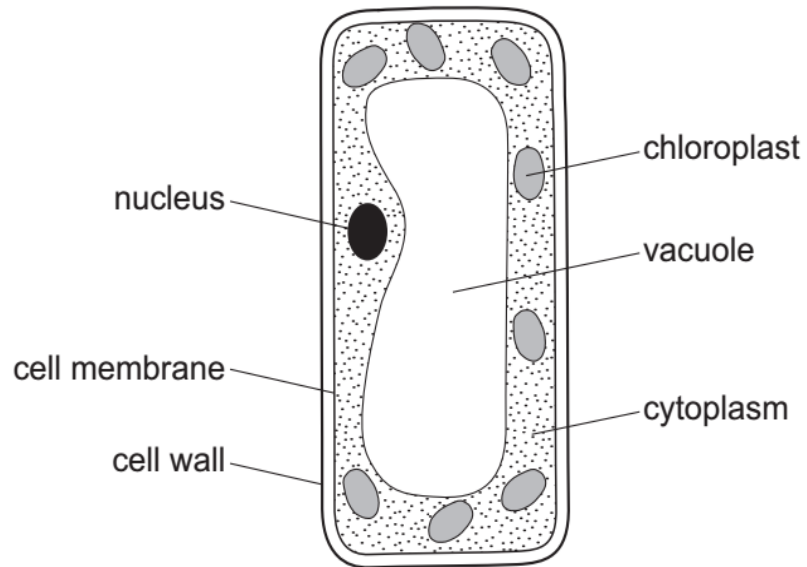
(c) Ahmed correctly predicts he will weigh more on Earth than on Mars.

Explain how the information in the table supports his prediction.

.....
.....

[1]

7 The diagram shows a palisade cell.



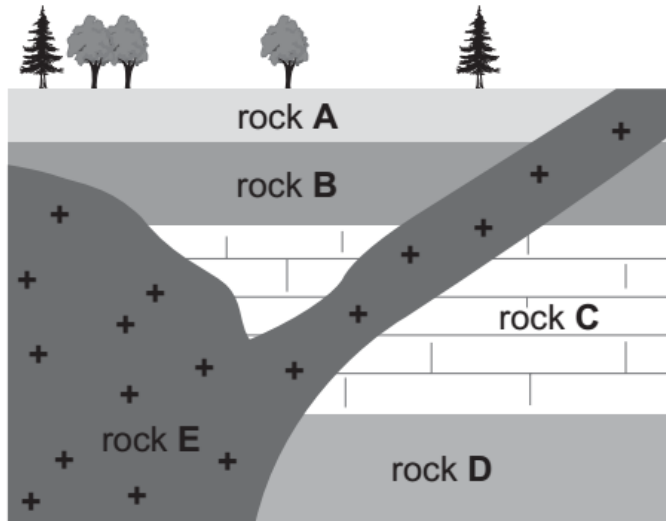
(a) Which three structures, labelled in the diagram, are **not** found in animal cells?

- 1.
- 2.
- 3. [3]

(b) Name the part of the cell in which photosynthesis takes place.

..... [1]

8 The diagram shows the rocks on the sides of a deep quarry.



Rocks **A**, **B** and **C** are sedimentary rocks. They were formed when tiny rock particles built up in layers and were compressed.

Rock **D** was formed when limestone (a sedimentary rock) was heated to a very high temperature, at high pressure, and then cooled.

Rock **E** was formed when hot magma (liquid rock) cooled and solidified.

(a) Rock **A** contains fossils.

(i) What is a fossil?

.....
..... [2]

(ii) Choose the letters of **two other** rocks that could contain fossils.

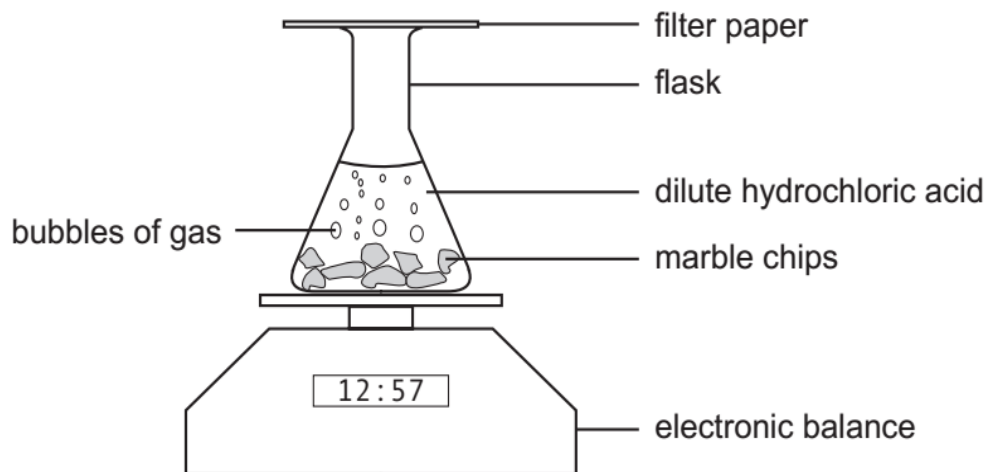
..... and [1]

(b) Suggest how the limestone was heated to form rock **D**.

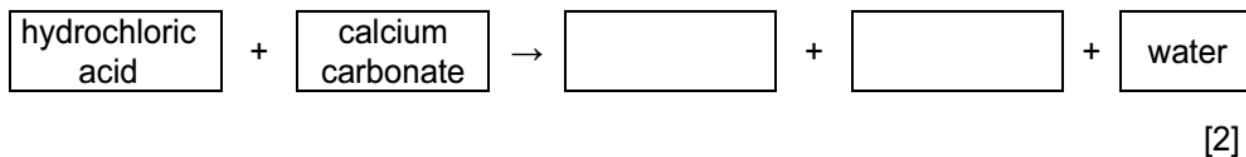
.....
..... [1]

9 Hydrochloric acid reacts with marble (calcium carbonate).

The diagram shows an experiment to measure the rate of this reaction.



(a) Complete the word equation for this reaction.

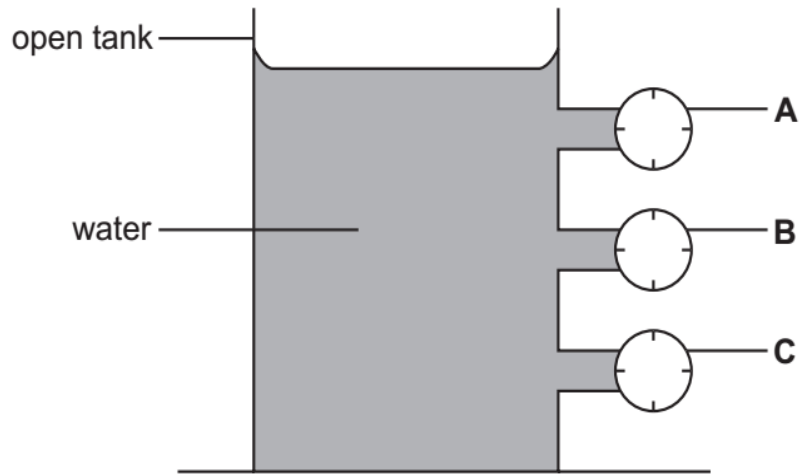


(b) Why do the beaker and its contents lose mass?

..... [1]

10 (a) The diagram shows an open tank containing water.

A, B and C are gauges which measure water pressure in the tank.



(i) Tick the statement which is correct.

The water pressure is greatest at **A**.

The water pressure is greatest at **B**.

The water pressure is greatest at **C**.

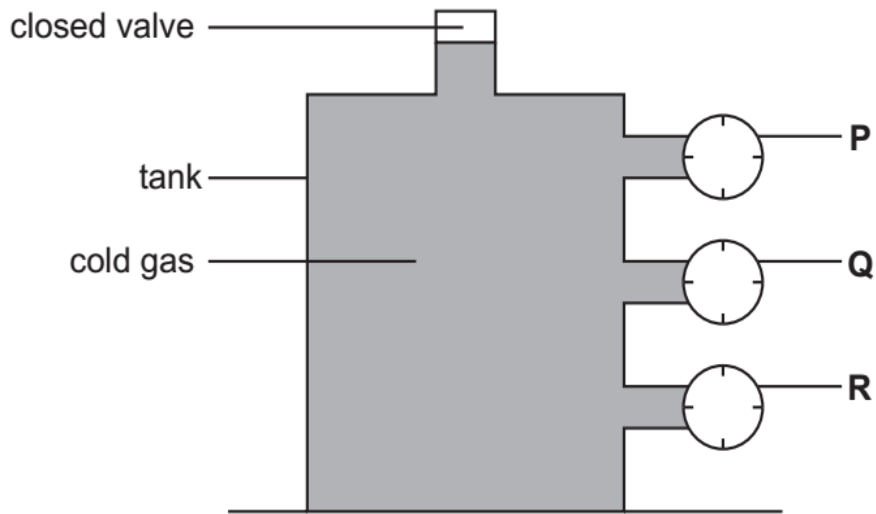
The water pressure at **A**, **B** and **C** is the same.

[1]

(ii) What happens to the readings on the gauges if more water is added to the tank?

..... [1]

(b) The diagram shows a sealed tank which contains a cold gas. It is fitted with pressure gauges at **P**, **Q** and **R**.



(i) Tick the statement which is correct.

The pressure is greatest at **P**.

The pressure is greatest at **Q**.

The pressure is greatest at **R**.

The pressure at **P**, **Q** and **R** is the same.

[1]

(ii) What happens to the readings on the gauges if the gas warms up?

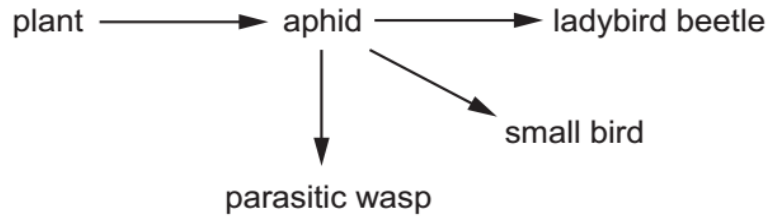
..... [1]

(iii) Explain how the gas particles exert pressure on the walls of the tank.

.....
..... [1]

11 Aphids are insects which suck the sugary sap from plants to obtain their food. They are a particular problem on greenhouse crops.

(a) The diagram shows feeding relationships including aphids.



Suggest one reason why aphids are more likely to increase their numbers on greenhouse crops than on those grown in open fields.

..... [1]

(b) Parasitic wasps are sold to provide biological control of aphids in greenhouses.

The wasps are supplied in containers with the following instructions:

Do not use until there are aphids in the greenhouse.

Do not use pesticides in the greenhouse.

(i) Why must there be aphids in the greenhouse before you introduce the parasitic wasps?

..... [1]

(ii) Why is it important not to use pesticides when you have introduced parasitic wasps?

..... [1]

(c) At the end of the growing season the plants will be removed from the greenhouse.

(i) What will happen to the population of wasps?

..... [1]

(ii) Explain why this method of control can be described as more environmentally friendly than the use of pesticides.

..... [1]
.....

- 12 Hassan does an experiment to find the maximum friction force between a wooden block and different surfaces.



Here are his results.

surface	friction force in N		
	test 1	test 2	test 3
carpet	24.5	32.6	26.4
glass	9.3	9.6	10.2
wood	15.0	18.1	16.4

- (a) Name the apparatus Hassan uses to measure the friction force.

..... [1]

- (b) Hassan repeated the measurements for each surface three times.

Explain why.

.....
 [1]

- (c) Calculate the average (mean) friction force for the glass experiment.

average (mean) friction force = N [1]

- (d) Circle the **one** anomalous reading in the table.

[1]

13 Hydrogen peroxide is used to make oxygen in the laboratory.

Hydrogen peroxide breaks down to form water and oxygen.

(a) This reaction is much faster when a chemical called manganese(IV) oxide is added to the hydrogen peroxide.

The manganese(IV) oxide is unchanged at the end of the reaction.

What type of chemical is manganese(IV) oxide?

Tick (✓) the **correct** answer.

acid

alkali

catalyst

metal

[1]

(b) Blessy investigates the effect of temperature on the breakdown of hydrogen peroxide.

(i) Write down the variable she should **change**.

.....

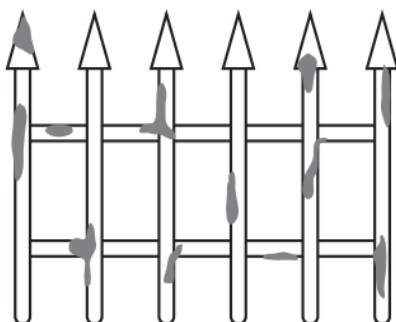
[1]

(ii) Write down **one** variable she should **control** (keep the same).

.....

[1]

14 Some metal railings have started to rust.



(a) Which metal were the railings made of?

Circle the correct answer.

aluminium

copper

iron

lead

[1]

(b) Which **two** substances must be present for the railings to rust?

Circle the **two** correct answers.

carbon dioxide

hydrogen

nitrogen

oxygen

water

[2]

(c) How can you prevent railings from rusting?

..... [1]