OCR
RECOGNISING ACHIEVEMENT

GCSE

SCIENCE B

F B622/01

Science B Unit 2 Modules B2, C2, P2

Specimen Paper

60 mins

Candidates answer on the question paper:
Additional materials: ruler (cm/mm), calculator

Candidate Name	

Centre Number						Candidate Number				

TIME 60 mins

INSTRUCTIONS TO CANDIDATES

- Write your name, centre number and candidate number in the boxes above.
- Answer **all** the questions.
- Write your answers on the dotted lines unless the question says otherwise.
- Use blue or black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure you know what you have to do before starting your answer.
- There is a space after most questions. Use it to do your working. In many questions marks will be given for a correct method even if the answer is incorrect.
- Do not write in the bar code. Do not write in the grey area between the pages.
- DO NOT WRITE IN THE AREA OUTSIDE THE BOX BORDERING EACH PAGE. ANY WRITING IN THIS AREA WILL NOT BE MARKED.

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [ ] at the end of each question or part question.
- The total number of marks for this paper is **60.**

This specimen paper consists of 33 printed pages.

 Registered Charity Number: 1066969

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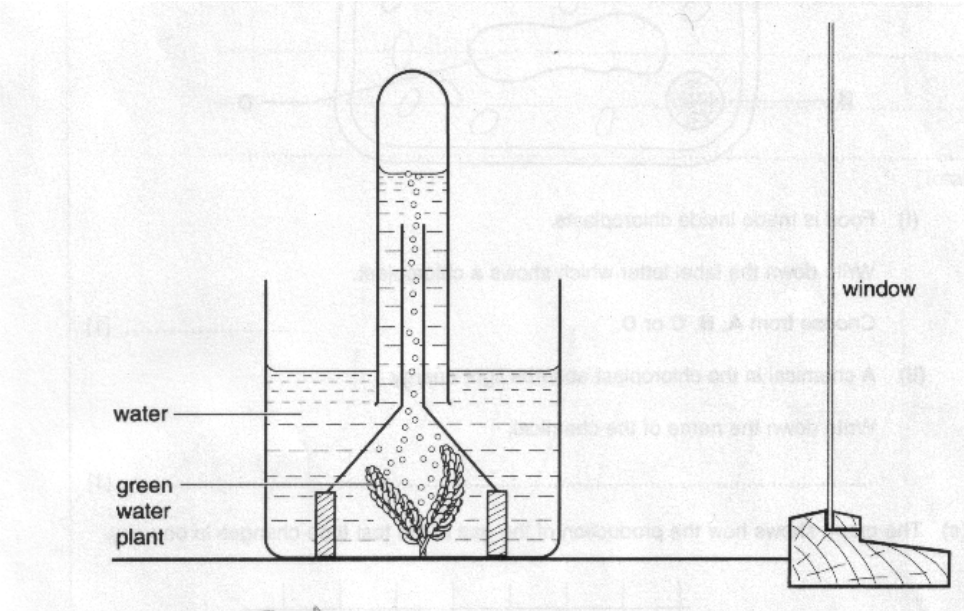
Answer all questions

Section 1

1. Kaysha is investigating how plants make food.

The diagram shows the apparatus that she uses.

The apparatus is near a sunny window.



(a) (i) What is the name of the process that plants use to make food?

Put a (ring) around the correct answer.

digestion **photosynthesis** **respiration**

[1]

(ii) Look at the diagram.

The plant has made a gas.

The gas is at the top of the test tube.

What is the name of the gas that is at the top of the test tube?

Put a (ring) around the correct answer.

carbon dioxide **nitrogen** **oxygen**

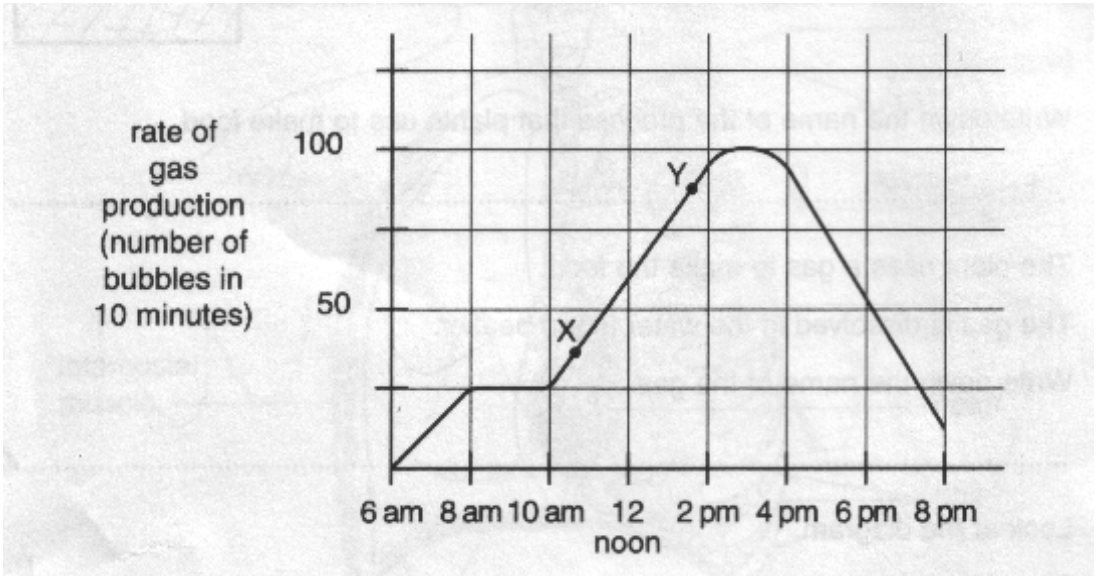
[1]

(b) The apparatus is near a sunny window. How will this help the plant make food?

.....[1]

(c) The green plant in the experiment produced a gas.

The graph shows how the production of the gas in the test tube changes in one day.



Look at the graph.

(i) Between what times does the rate of gas production stay the same?

From..... to .....[1]

(ii) The rate of gas production changes between points **X** and **Y** on the curve.

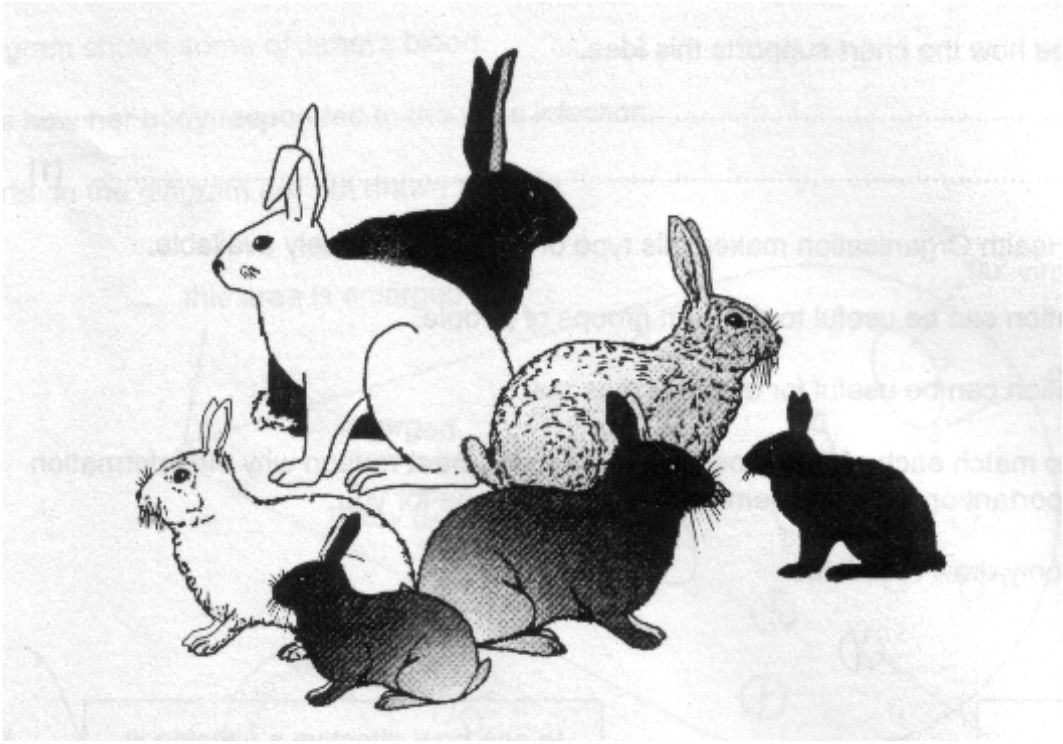
Suggest why.

.....

.....[1]

[Total: 5]

2. Stacey and Patrick have some pet rabbits.



Look at the rabbits.

(a) Describe **one** difference between the rabbits that you can **see** in the pictures.

.....

.....[1]

(b) Rabbits are herbivores.

Predators hunt them for food.

Suggest how **one** of the features **you can see** could help a rabbit to survive in its natural environment.

Feature .....

How it helps a rabbit to survive .....

.....[1]

(c) The differences between the rabbits are called **variation**.

Write about the different **causes** of variation.

.....

.....

.....

.....[2]

[Total: 4]

3. Pippa and Peter are doing a survey of the animals and plants that live in a field.
The field has lots of wild plants in it.

(a) They use quadrats to survey the plants.

Write instructions to tell Pippa and Peter how to use a quadrat in their survey.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

[2]

(b) Next they collect insects.

They walk through the plants dragging nets behind them.

Look at their results.

type of insect	number found by Pippa	number found by Peter
ladybirds	5	2
greenflies	20	8
grasshoppers	1	0
wasps	2	1
crane-flies	4	2
butterflies	3	1

Pippa and Peter get different results.

Suggest why.

.....

.....[1]

(c) Look at the list.

It shows pieces of equipment that can be used to collect insects.

beating tray

net

pitfall trap

pooter

Some insects move around on the ground at night.

Which piece of equipment would be best to leave overnight to collect these insects?

Choose your answer from the list.

.....[1]

[Total: 4]

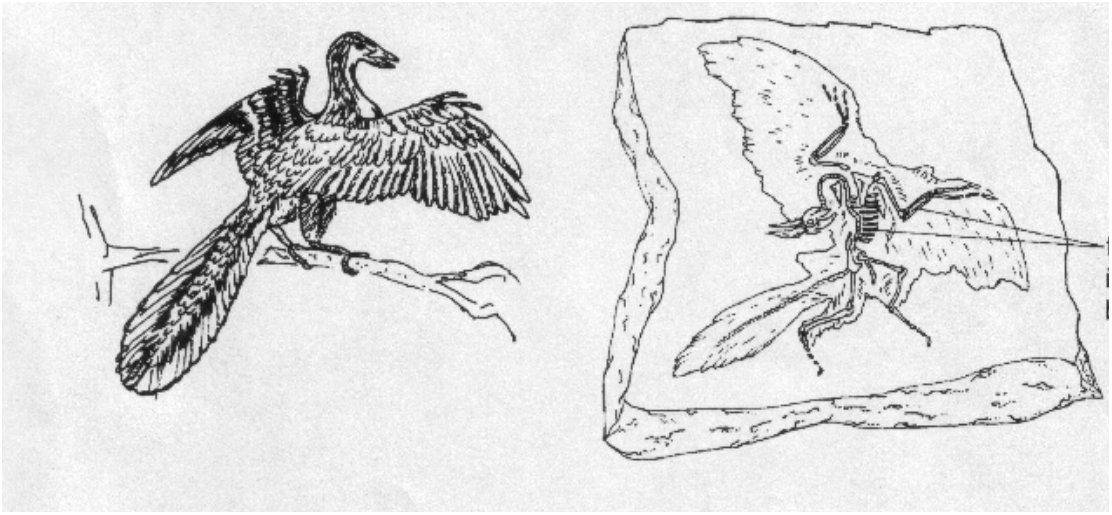
4. Picture **A** shows an animal that lived millions of years ago.

Now it is extinct.

Picture **B** shows a fossil of the animal.

Picture A
(This is what the scientist think the animal looked like)

Picture B
(a fossil of the animal)



The fossil was found in rock.

Look at picture **B**.

(a) **(i)** Some internal body parts of the animal have been fossilised.

What type of internal body parts have been fossilised?

.....[1]

(ii) Scientists think that the animal had feathers.

What evidence is there that the animal had feathers?

.....

.....[1]

(b) Fossils cannot show us exactly what extinct animals looked like.

Write down **one** reason why.

.....

.....[1]

(c) Scientists think that birds and reptiles evolved from the same ancestor.

The fossil is evidence that this might have happened.

We cannot be **sure** that birds and reptiles had the same ancestor.

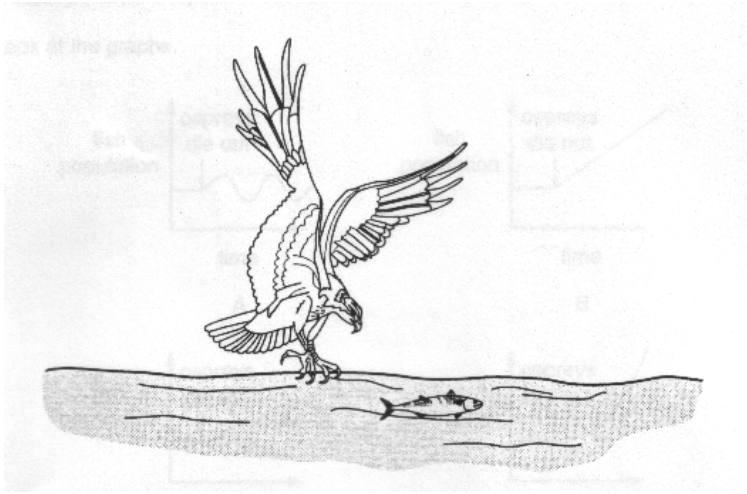
Write down **one** reason why we cannot be sure.

.....

.....[1]

[Total: 4]

5. Ospreys are birds that survive by hunting fish.



The number of ospreys in Britain is low.

This has been partly because of:

- hunting,
- egg collecting,
- poisoning by pesticides.

(a) Some ospreys have been poisoned by pesticides that farmers have put on their crops.
The ospreys take in pesticides from the fish they eat.
How could the pesticides get into the river?

.....

.....[1]

(b) Ospreys are now protected from hunters and egg collectors.
Suggest **two** ways they are protected.

1 .....

.....

2 .....

.....[2]

[Total: 3]

Section 2

6. The air contains many pollutants.

(a) Draw lines to match each pollutant with the problem it causes.

pollutant in the air	main problem that the pollutant causes
carbon dioxide	ozone depletion in the upper atmosphere
carbon monoxide	the greenhouse effect
chlorofluorocarbons	acid rain
sulphur dioxide	poisonous to humans

[3]

(b) A chlorofluorocarbon has the formula $C_2Cl_2F_4$.

(i) How many chlorine atoms are there in one molecule of $C_2Cl_2F_4$?

.....[1]

(ii) How many different elements are combined in $C_2Cl_2F_4$?

.....[1]

[Total: 5]

7. Car bodies made from iron and steel will rust.

The picture shows a rusty car body.

(a) Two substances are needed for the iron parts in a car to rust.

One of these is oxygen.

What is the name of the other substance?

.....[1]

(b) Nowadays some car bodies are made from aluminium.

Write down **one** advantage of using aluminium instead of iron.

.....

.....[1]

(c) Sam is a research scientist.

He has just discovered a new alloy.

This alloy is suitable for making car bodies.

Sam decides to tell other scientists around the world about his discovery.

Describe how, **and** explain why Sam should tell other scientists.

.....

.....

.....

.....

.....[2]

[Total: 4]

8. Dilute hydrogen peroxide is used to make oxygen in a laboratory.

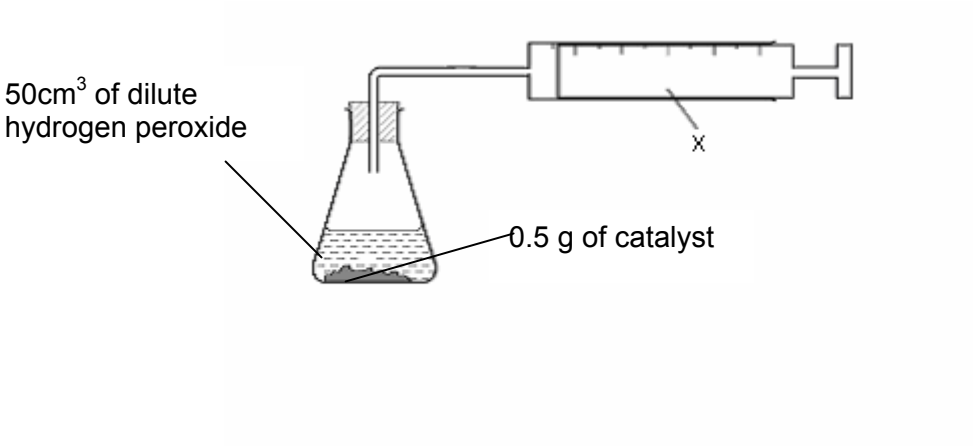
Hydrogen peroxide decomposes to make water and oxygen.

(a) Write the word equation for this decomposition reaction.

.....[1]

(b) Laura investigates the decomposition of dilute hydrogen peroxide at room temperature.

Look at the apparatus she uses.



What is the name of the piece of apparatus labelled **X**?

Choose from

gas syringe

measuring cylinder

metre rule

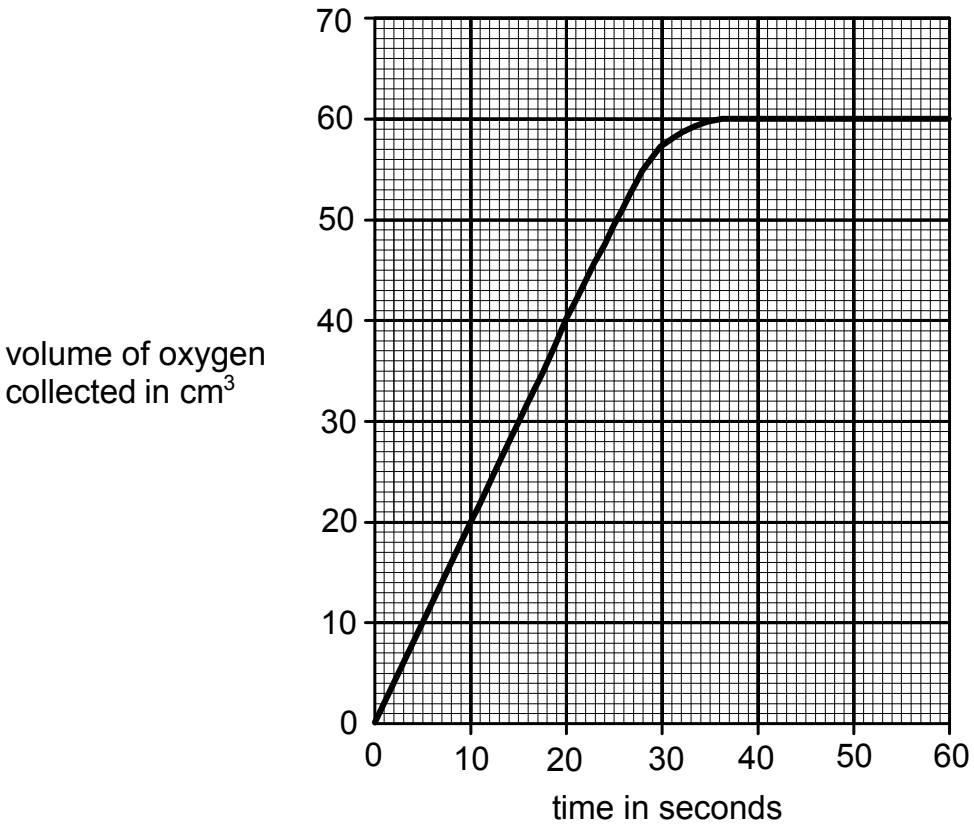
pipette

.....[1]

(c) Laura uses 50 cm^3 of dilute hydrogen peroxide and 0.5 g of a catalyst.

Laura records the volume of oxygen collected every 10 seconds.

This is a graph of Laura's results.



Look at the graph.

(i) What is the volume of oxygen collected after 20 seconds?

..... cm^3 [1]

(ii) The reaction stops when all the hydrogen peroxide has been used up.

How long does it take for all the hydrogen peroxide to react?

..... seconds [1]

(iii) Laura uses 0.5 g of a catalyst.

How much of the catalyst remains at the end of the reaction?

Choose from

more than 0.5 g

0.5 g

less than 0.5 g

.....[1]

(d) Laura wants to make the decomposition reaction of hydrogen peroxide faster.

She still wants to use

- 0.5 g of the catalyst
- 50 cm^3 of hydrogen peroxide solution.

Write about some of the ways that she can make the reaction faster.

.....

.....

.....

.....

.....

.....[3]

[Total: 8]

9. Cement is made from a rock called limestone.

(a) Limestone is removed from the ground in a quarry.

Look at this picture of a limestone quarry.

Limestone quarries cause some environmental problems.

One problem is that the quarry produces lots of dust.

Write about **two other** environmental problems.

1 .....

.....

2 .....

.....[2]

(b) Cement, sand and water are used to make concrete.

Describe how concrete is **reinforced**.

.....

.....[1]

[Total: 3]

Section 3

10. Liz was watching a comet with a pair of binoculars. Her friend said it might be a **near Earth object**.

(a) Liz is worried that the comet might be a near Earth object.

Suggest why she is worried?

.....

.....[2]

(b) The comet only has a tail when it is close to the Sun.

Suggest a reason for this?

.....

.....

.....

.....[2]

[Total: 4]

11. The first spacecraft to visit the Moon were unmanned robots. By 1969, humans had landed on the Moon.

(a) Suggest **two reasons** why manned spacecraft are not used to explore other planets?

1 .....[2]

2 .....

(b) It costs a large amount of money to send spacecraft to other planets. Scientists often have to persuade governments that this is a good way to spend money.

Suggest **two reasons** scientists might give to persuade governments that it is worthwhile.

1 .....

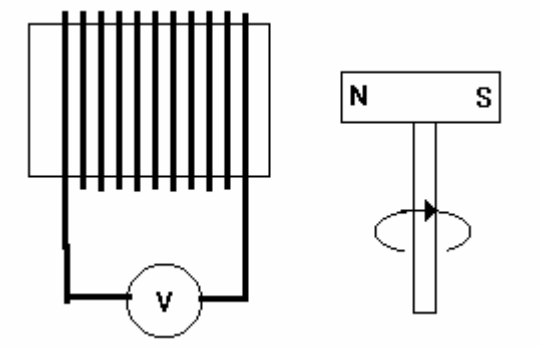
.....

2 .....

.....[2]

[Total: 4]

12. Most of the electricity generated in the UK is made using a turbine and a generator. A model of this is shown to Sarah.



Sarah makes some electricity by slowly spinning the magnet.

(a) Write down **two** things she can do to increase the amount of electricity generated.

1 .....

2 .....[2]

(b) Electricity is distributed around the country through the National Grid.

(i) What name is given to the wires that carry the electricity from power stations around the country?

.....[1]

(ii) Heat energy is lost when electricity is distributed around the country.

How can this heat loss be reduced?

Put a (ring) around the correct answer.

decrease the voltage **decrease the current** **decrease the power** [1]

(c) Sarah's teacher then shows her some values for a mobile electrical generator.

For every 45 MJ of diesel burnt the amount of energy produced is 20 MJ.

(i) Where does the rest of the energy go?

.....[1]

(ii) Calculate the efficiency of the electrical generator.

$$\text{Efficiency} = \frac{\text{Useful energy out}}{\text{Total energy in}}$$

.....

.....

.....[1]

[Total: 6]

13. Adrian visits a South American village, near to the equator that wants to produce electricity. The villagers could use a photocell to collect energy from the Sun.

(a) One advantage of using the Sun is that it is a **renewable energy source**. What does **renewable energy source** mean?

.....

.....[1]

(b) State one other **advantage** and one **disadvantage** of using photocells to produce electricity.

Advantage .....

Disadvantage .....[2]

(c) What **type** of electrical current is produced from the photocell?
Put a (ring) around the correct answer.

Alternating

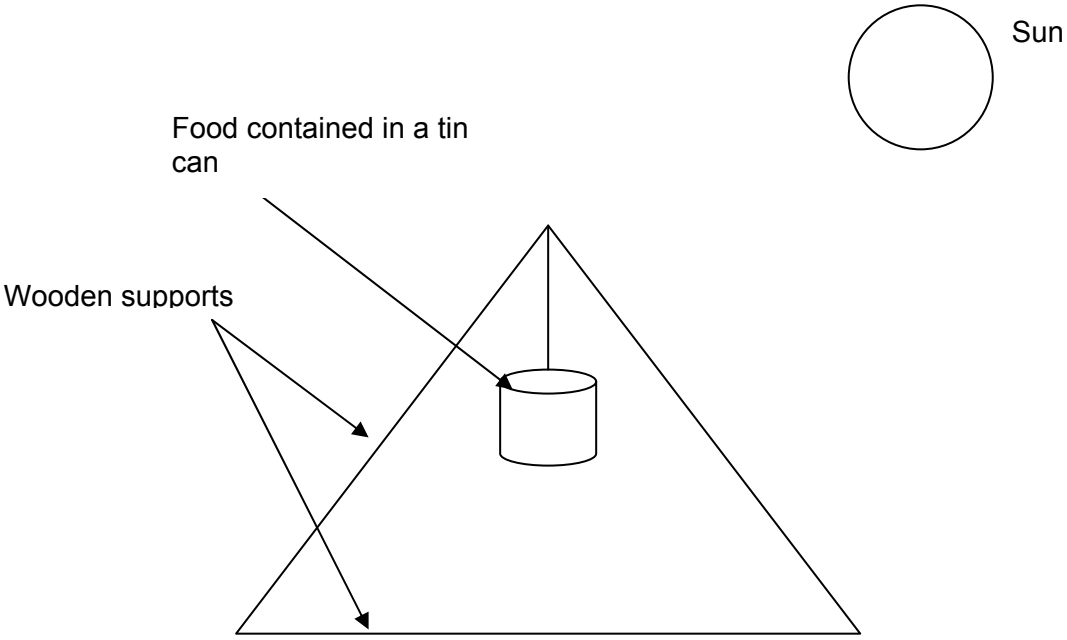
Direct

Earth

[1]

(d) Adrian finds that some villagers use a solar cooker to cook food.

Finish the diagram to show the mirror in the solar cooker.



[2]

[Total: 6]

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RECOGNISING ACHIEVEMENT

GCSE

SCIENCE B

F **B622/01**

Science B Unit 2 Modules B2, C2, P2

Specimen Mark Scheme

60 mins

Maximum mark for this paper is 60

This specimen mark scheme consists of 5 printed pages.

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Question Number	Answer	Max Mark
Section 1		
1(a)i	photosynthesis;	**[1]**
1(a)ii	oxygen;	**[1]**
1(b)	sunlight is needed for photosynthesis/to make food;	**[1]**
1(c)i	8am-10am **(both for one mark)**	**[1]**
1(c)ii	more sunlight available;	**[1]**
	Total marks	**[5]**
2(a)	Any one description from: size; colour; fur; **(accept any correct description)**	**[1]**
2(b)	**Any one from: (no mark for feature)** (eyes at side of head) give wide field of vision to see predators approaching; (strong back legs) to provide fast movement for escape; (large ears) to hear movement as predator approaches; (different colour fur) camouflage to hide from predators; **(accept any correctly related suggestion)**	**[1]**
2(c)	variation due to the environment such as scars/injuries etc; Genetic variation caysed by the genes from parents	**[2]**
	Total marks	**[4]**
3(a)	Any two from: Random placing of quadrat; count plants inside the quadrat; Repeat; Calculate average for field;	**[2]**
3(b)	Any one from: Peter holding net too high; Peter sweeping across rather than from lower down and up the plants; there are fewer tall plants where Peter is sweeping;	**[1]**
3(c)	pitfall trap;	**[1]**
	Total marks	**[4]**
4(a)i	Bones;	**[1]**
4(a)ii	imprint in rock around fossil;	**[1]**
4(b)	Any one from: parts of the body are lost; fossil incomplete; not all of the body parts are fossilised;	**[1]**
4(c)	Others show similar features; Fossil record not complete;	**[1]**
	Total marks	**[4]**

5(a)	Pesticides land on the soil then the rain leaches the pesticides through the soil into the water;	**[1]**
5(b)	Any two from: Laws have been passed to prevent people hunting the osprey; removing eggs from nests; destroying their habitats; Public education programmes make people more aware of the problem; Their habitats become conservation areas to reduce damage to habitat; **Total marks**	**[2]** **[3]**
Section 2 **6(a)**	Carbon dioxide ----- Greenhouse effect Carbon monoxide -- Poisonous CFCs ---------- Ozone depletion Sulphur dioxide ----- Acid rain **All four correct (3) Two or three correct (2) One correct (1)**	**[3]**
6(b)i	2	**[1]**
6(b)ii	3 **Total marks**	**[1]** **[5]**
7(a)	Water **(allow moisture)**	**[1]**
7(b)	Aluminium does not rust / aluminium has a lower density / same car body will weigh less	**[1]**
7(c)	**Any two from** Means of communication e.g. phone, conference, internet, book, journal, meeting; To get work evaluated / aw ; So no other scientist could take credit; So other scientists could develop the work / aw; **Total marks**	**[2]** **[4]**

8(a)	Hydrogen peroxide → oxygen + water (**Allow** correct formulae instead of names) **Allow** = in equation) **(any order for oxygen and water)**	**[1]**
8(b)	(Gas) syringe	**[1]**
8(c)i	40 (cm^3) **(Unit not needed)**	**[1]**
8(c)ii	34-38 (seconds) **(unit not needed)**	**[1]**
8(c)iii	0.5 (g) **(unit not needed)**	**[1]**
8(d)	Any three from Increase concentration, more crowded particles, so more collisions, Use powdered catalyst, more surface area, so more collisions, Use a higher temperature / hotter / heat , particles move faster / particles have more energy / more successful collisions / more energetic collisions, Stir or shake	**[3]**
	Total marks	**[8]**
9(a)	**Any two from** Lots of noise pollution / aw; Lots of lorries / aw; Damage to landscape / aw; When finished need to fill in the hole / aw	**[2]**
9(b)	Add steel (rod) to mixture / aw	**[1]**
	Total marks	**[3]**
Section 3		
10(a)	It might hit the earth;	**[1]**
	(causing) floods / death/ destruction **(Allow any reasonable disaster);**	**[1]**
10(b)	Trail of debris owtte;	**[1]**
	(Caused by) heat from the sun	**[1]**
	Total marks	**[4]**
11(a)	Robots don't need water/food / oxygen/ can survive more harsh conditions/ **(Any 2)**	**[2]**
11(b)	To find other life forms/ to advance technology/ to find new mineral deposits (accept any other sensible reason)	**[2]**
	Total marks	**[4]**

12(a)	More coils; Spin (magnet) faster **(Accept use stronger magnet and move coils closer to magnet)**	**[1]** **[1]**
12(b)i	Transmission lines;	**[1]**
12(b)ii	Ring around decrease current;	**[1]**
12(c)i	Lost as <u>heat;</u>	**[1]**
12(c)ii	Efficiency = useful energy out/ total energy in20÷45; 44.4% **1 mark for correct working answer** **Total marks**	**[1]** **[6]**
13(a)	Idea of being replaced quickly (allow never runs out)	**[1]**
13(b)	Idea of no chemical pollution/no fuel costs; Expensive to set up/only works in the day (other sensible reason)	**[1]** **[1]**
13(c)	Direct (current) (allow DC)	**[1]**
13(d)	Drawing of a <u>curved</u>; mirror underneath food container	**[1]** **[1]**
	Total marks **Overall marks**	**[6]** **[60]**