WJEC GCSE BIOLOGY

BIOLOGY



EXAM QUESTION PACK

UNIT B2 FOUNDATION TIER 0239 PAPERS

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Surname	Centre Number	Candidate Number
Other Names		0

GCSE

0239/01

ADDITIONAL SCIENCE
FOUNDATION TIER
BIOLOGY 2

A.M. MONDAY, 28 January 2013

45 minutes

For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1	**8**	
2	**8**	
3	**7**	
4	**12**	
5	**8**	
6	**7**	
Total	**50**	

0239 010001

ADDITIONAL MATERIALS

In addition to this paper you may require a calculator and a ruler.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen.
Write your name, centre number and candidate number in the spaces at the top of this page.
Answer **all** questions.
Write your answers in the spaces provided in this booklet.

INFORMATION FOR CANDIDATES

The number of marks is given in brackets at the end of each question or part-question.
You are reminded of the necessity for good English and orderly presentation in your answers.

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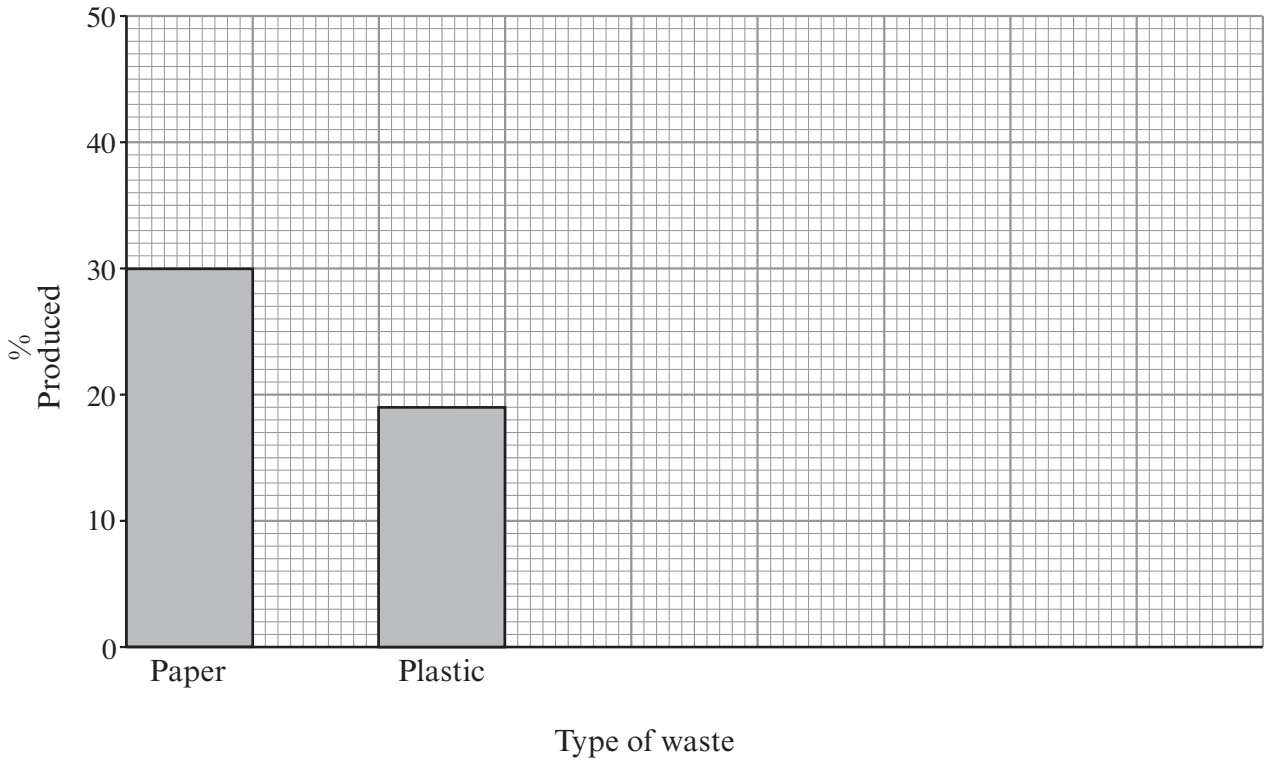
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Answer **all** *questions.*

1. Pupils in a school investigated the different types of waste the school was producing. The results are shown in the table below.

Type of waste	Percentage (%) produced
Paper	30
Plastic	19
Cardboard	11
Glass	3
Food Waste	37

(a) Use a ruler to plot a bar graph to show these results. Two have been completed for you. [3]



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(b) The pupils researched the effect of plastic waste on wildlife.
They found that:

- 2 million seabirds die each year due to eating or getting wrapped in plastic.
- Turtles eat plastic bags mistaking them for jellyfish, their normal food.
- A dead whale was found to have a kilogram of plastic in its stomach.
- Burning plastic releases poisonous gases.
- The UK is running out of sites to dump plastic.



Turtle eating plastic

0239 010003

Using this information, answer the following questions. [3]

(i) What do turtles normally eat?

.....

(ii) Why do so many seabirds die?

.....

(iii) Why should plastic waste not be burnt?

.....

(c) Suggest **two** ways in which we can cut down the amount of plastic waste. [2]

.....

.....

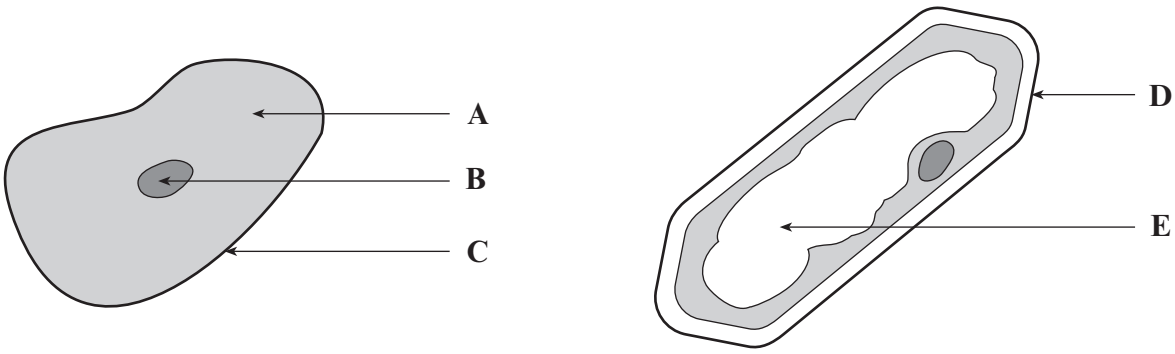
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2. The diagram below shows the structure of an animal and plant cell.



Animal Cell

Plant Cell

(a) Name parts **A** to **E** by using some of the following words. [5]

nucleus, vacuole, cell wall, chloroplast, cell membrane, cytoplasm

A .....

B .....

C .....

D .....

E .....

(b) Use the **letters from the diagram** to show which part: [3]

(i) contains genes; .....

(ii) is found **only** in plants; .....

(iii) controls the entry of substances into the cell. .....

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3. Read the information about organisms in a woodland and use it to answer the questions.



hedgehog caterpillar snail thrush sparrow fox

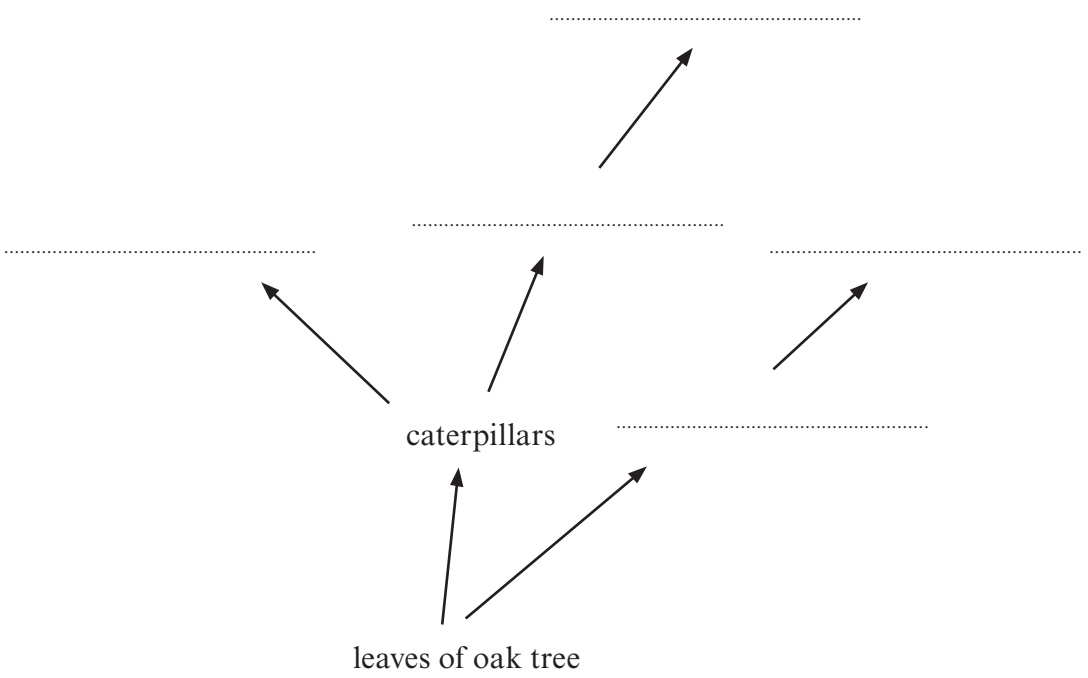
Snails and caterpillars eat leaves.

Caterpillars are eaten by sparrows and hedgehogs.

Thrushes eat snails.

Foxes eat hedgehogs.

(a) Complete the food web below using only the information above. [4]



(b) From the food web above name

(i) the producer; [1]

.....

(ii) **one** herbivore. [1]

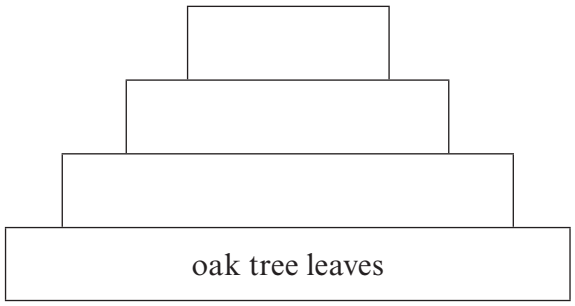
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(iii) Using the food web opposite complete the pyramid of numbers below. [1]



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4. *(a)* Complete the sentences below using some of the words in the list: [3]

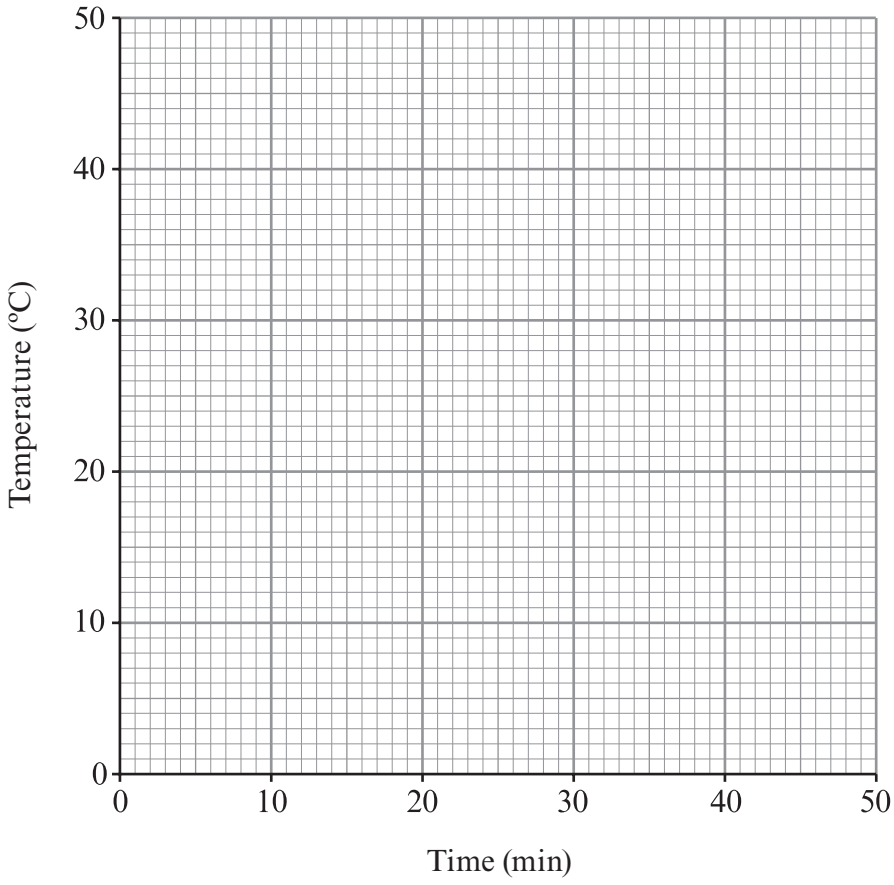
aerobic, energy, enzymes, diffusion

During respiration chemical reactions occur which release ..... and which are controlled by ..... . When oxygen is available we say that respiration is ..... .

(b) Jordan competes in a race during which his skin temperature is measured every 10 minutes. The results are shown in the table below.

Time (min)	Skin Temperature (°C)
0 (start)	30
10	32
20	38
30	44
40	40

(i) Plot the results on the graph. Join the points with a ruler. [3]



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(ii) The temperature after 10 minutes is 32 °C.
From your graph, what is the temperature after 25 minutes? [1]

.....

(iii) Work out the temperature increase between 10 and 25 minutes. [1]

Answer ..... °C

(iv) What process causes the temperature to increase? [1]

.....

(v) How could this investigation be made more reliable? [1]

.....

(c) Fill in the gaps in the equation by naming two waste products of respiration. [2]

glucose + oxygen ⟶ ..... + ...

12

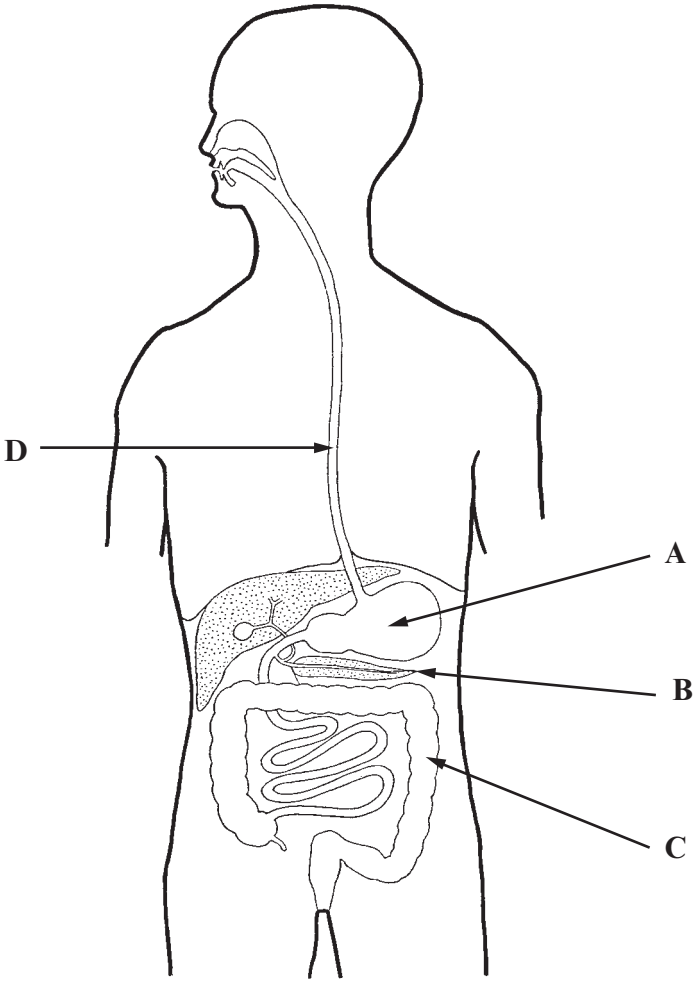
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5. The diagram shows the human digestive system.



(a) Name the structures labelled **A** to **D**. [4]

A .....

B .....

C .....

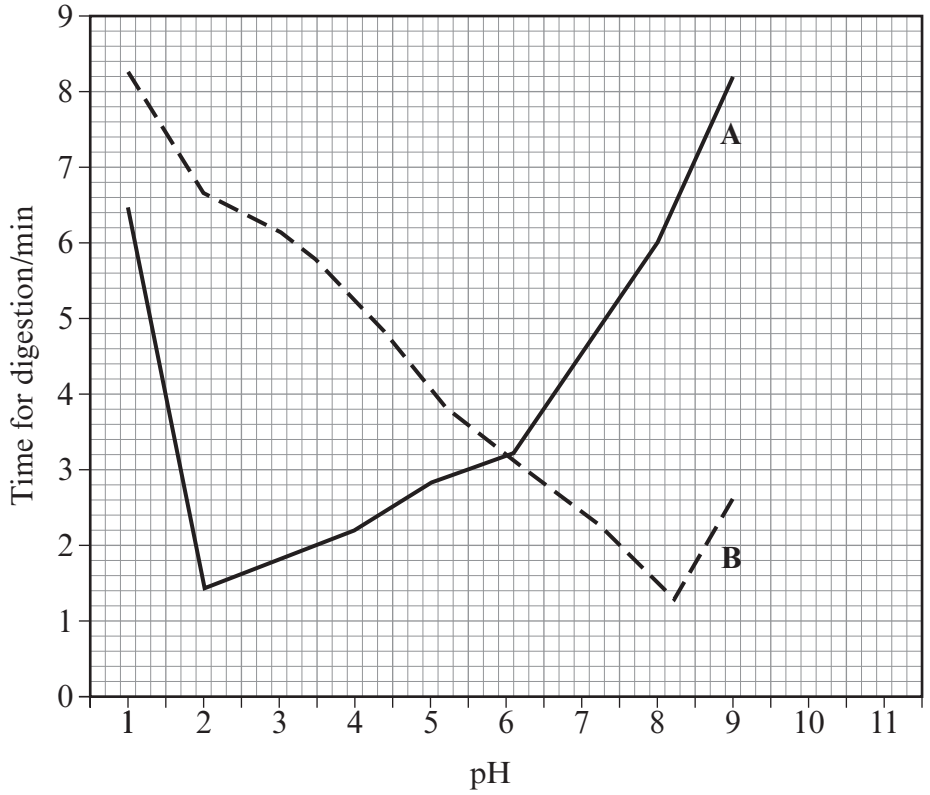
D .....

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(b) The graph below shows the result of an investigation into the effect of pH on the action of two digestive enzymes labelled **A** and **B**.



(i) From the graph, state the time taken for the enzyme **B** to complete its digestion at pH 4.5. [1]

.....

(ii) At what pH is the rate of reaction the same for both enzymes? [1]

.....

(iii) From the graph, describe the effect of pH on the action of enzyme **A**. [2]

.....

.....

.....

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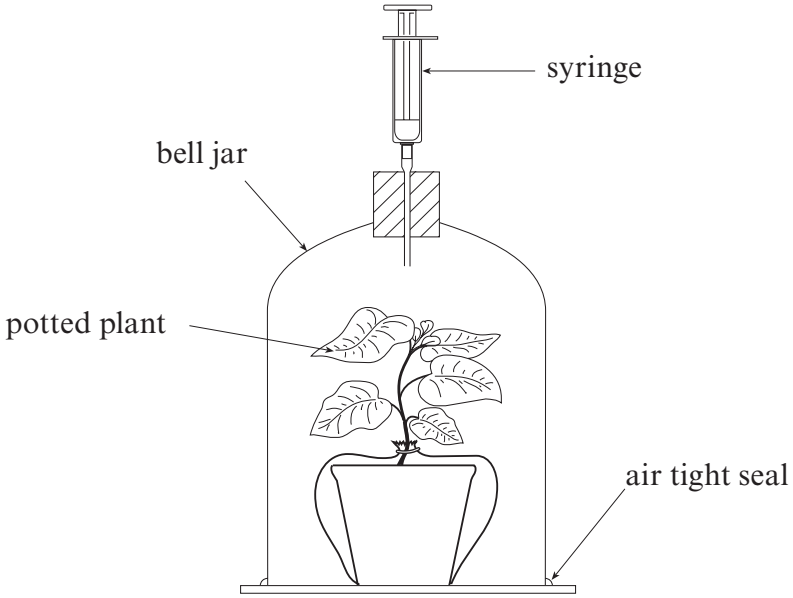
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6. The apparatus below was set up as shown and exposed to bright sunlight for 6 hours.



Before and after the exposure to light, samples of air in the bell jar were collected using the syringe.
The samples of air were analysed for carbon dioxide and oxygen content.

(a) Complete the table below to show whether the percentage of gas in the sample had changed using the words **increased** or **decreased**. [2]

Gas	% of gas before exposure to light	After 6 hours of exposure to bright sunlight
Carbon dioxide	0.03	
Oxygen	21	

(b) Explain your answer to *(a)*. [4]

.....

.....

.....

.....

.....

.....

(c) Suggest what could be done to the apparatus to reverse the exchange of gases. [1]

.....

END OF PAPER

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GCSE MARKING SCHEME

SCIENCE - BIOLOGY (LEGACY)

JANUARY 2013

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INTRODUCTION

The marking schemes which follow were those used by WJEC for the January 2013 examination in GCSE SCIENCE - BIOLOGY (LEGACY). They were finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conferences were held shortly after the papers were taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conferences was to ensure that the marking schemes were interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conferences, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about these marking schemes.

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B2 (LEGACY) MARK SCHEME - JANUARY 2013

FOUNDATION TIER

Question			Marking details	Marks Available
Q.1	(a)		All 3 bars correct, labelled; and correct height; Quality of drawing – same width as those given	[3]
	(b)	(i)	jellyfish;	[3]
		(ii)	eat them / wrapped in it;	
		(iii)	produces poisonous gases;	
	(c)		Reuse bags/refill bottles/ charge for bags; Recycle; Reduce or no packaging /alternative packaging; Biodegradable; (Any 2 from 4)	[2]
			Question Total	**[8 Marks]**

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Question			Marking details	Marks Available
Q.2	(a)		A - Cytoplasm; B - nucleus; C - (cell) membrane; D - cell wall; E- vacuole	[5]
	(b)	(i)	B;	
		(ii)	D/E;	
		(iii)	C;	[3]
			Question Total	**[8 Marks]**

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Question			Marking details		Marks Available
Q.3	(a)		*Fox* *Sparrows, Hedgehogs, Thrushes* *Snails* *4/5 correct = 4 marks* *3 correct = 3 marks* *2 correct = 2 marks* *1 correct = 1 mark*		[4]
	(b)	(i)	Leaves /(oak) tree; (allow: green plant)		[1]
		(ii)	Snail/caterpillar;		[1]
		(iii)	Caterpillar, hedgehog, fox;		[1]
				Question Total	**[7 Marks]**

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Question			Marking details	Marks Available
Q.4	(a)		Energy; enzymes; aerobic;	[3]
	(b)	(i)	Correct plots (+/- 0.5 small square); (-1 per error) line (joined with ruler through centre of plots	[2] [1]
		(ii)	Correct reading from candidates graph (41^{o}C);	[1]
		(iii)	9 (allow error carried forward from (ii));	[1]
		(iv)	(Heat from) respiration;	[1]
		(v)	Repeat (with other individuals)/do more experiments; (not: ref. to thermometer/measure more frequently)	[1]
	(c)		Carbon dioxide; water;	 [2]
			Question Total	**[12 Marks]**

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Question			Marking details				Marks Available
Q.5/1	(a)		A stomach;	B	pancreas;		
			C large intestine;	D	oesophagus/gullet;		[4]
	(b)	(i)	4.7 mins/ 4 mins 42 secs;				[1]
		(ii)	6;				[1]
		(iii)	As the pH rises up to pH2 the time taken becomes less;				[1]
			Above pH2 the time taken increases (ref. to pH2 once only);				[1]
						Question Total	**[8 Marks]**

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Question		Marking details	Marks Available
Q.6/2	(a)	Decreased;	[1]
		Increased;	[1]
		In the light;	[1]
	(b)	photosynthesis occurs;	[1]
		carbon dioxide is absorbed/taken in;	[1]
		oxygen produced;	[1]
		(not:equation)	
	(c)	Place apparatus in dark/cover in light-proof paper;	[1]
		(not switch off light – unless total darkness indicated)	
		Question Total	**[7 Marks]**

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B2

HIGHER TIER

Question		Marking details	Marks Available
Q.3	(a)	undifferentiated / unspecialised cell; Not: specialised cells	[1]
		which can change/develop into other types of cells or other types of tissues; accept: turn into other cells/ to become any other cells not: new cells/ take place of other cells	[1]
	(b)	(Any 2) no rejection issues/ body will accept cells/ the cells will be compatible; no <u>moral/ethical</u> issues (relating to the stem cells used); no need for tissue typing/ no need to check tissues match; no need for a donor/ to find a donor/wait for a donor; NOT: ethnic/ killing embryos / reference to religion	[2]
		Question Total	**[4 Marks]**

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Question			Marking details	Marks Available
Q.4	(a)		decrease the numbers (of sandeels);	[1]
			sandeels are eaten by herring;	[1]
			herring compete with sandeels for (animal) plankton/feed on plankton;	[1]
	(b)	(i)	Any 3 herring compete with birds for sandeels/reduce number of sandeels; sandeels do not have enough food / (animal) plankton; rise in sea temp (global warming) affect plankton distribution or numbers; fishing for sandeels; Not enough food for birds as numbers of sandeels dropping; (not: ref. bird breeding rate unqual./ref. herring killing sandeels)	[3]
		(ii)	quotas for <u>sandeel</u> fisheries / <u>sandeel</u> fishing ban or protected species/ marine or nature reserves; (not: captive breeding/increase number of seals/fishing ban unqual.)	[1]
			Question Total	**[7 Marks]**

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Q.5 (a) [9]

Carbon dioxide	B;	diffusion;	down a gradient;
Glucose	C;	active transport;	against a gradient;
Oxygen	A;	diffusion;	down a gradient;

Question total [9]

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Question			Marking details	Marks Available
Q.6	(a)	(i)	Aerobic respiration;	[1]
		(ii)	CO_2 / water;	[1]
	(b)	(i)	Slow release of / store of energy;	[1]
		(ii)	Rapid / immediate release of energy;	[1]
	(c)	(i)	Lactic acid;	[1]
		(ii)	Lack of/little oxygen; oxygen debt; anaerobic respiration; (any 2)	[2]
			Question Total	**[7 Marks]**

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Question			Marking details	Marks Available
Q.7	(a)		M = excretion (not: urination);	
	(b)		L = urea (correct spelling);	[1]
			X = urease (correct spelling);	[1]
	(c)	(i)	light/temperature;	[1]
		(ii)	plants die; because light is blocked out; decay (not: broken down); by <u>bacteria</u> (not: decomposers); use oxygen; for respiration; fish decrease/die from lack of oxygen (allow: suffocate); Any 4 x 1	[4]
			Question Total	**[8 Marks]**

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Surname	Centre Number	Candidate Number
Other Names		0

GCSE

0239/01

ADDITIONAL SCIENCE
FOUNDATION TIER
BIOLOGY 2

A.M. TUESDAY, 15 May 2012

45 minutes

For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1	**7**	
2	**6**	
3	**6**	
4	**8**	
5	**8**	
6	**7**	
7	**4**	
8	**4**	
Total	**50**	

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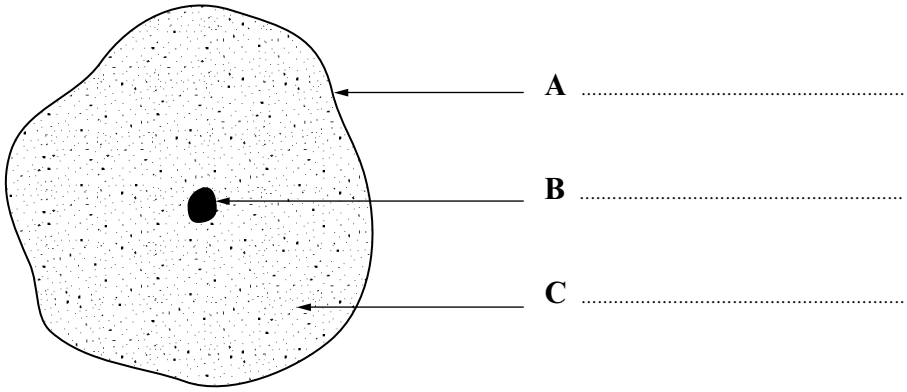
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Answer **all** *questions.*

1. *(a)* Some structures found in living cells are listed below.

cell membrane	nucleus
cytoplasm	vacuole
chloroplast	cell wall

(i) From the list above, label **A**, **B** and **C** on the diagram of an animal cell below [3]



(ii) From the list, name **two** structures which are found *only* in *plant* cells. [2]

.....

.....

(b) (i) Complete the sentence using one of the words below. [1]

skin nerve stem

During animal growth, ... cells develop into various types of cells.

(ii) Underline the correct statement below. [1]

Plants grow to a definite size but animals grow throughout life.

Plants grow throughout life but animals grow to a definite size.

Plants and animals grow to a definite size.

7

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2. Read the following information.

The Blue Footed Booby



- The Blue Footed Booby spends most of its life at sea, feeding on fish.
- It needs land near the coast for breeding. It produces very few eggs.
- Over-fishing by humans, sea pollution and tourism are increasing.
- Land near the coast has been used for building.
- Some tourists collect eggs.

Using **the above information only**:

(a) Why could each of the following cause numbers of the birds to decrease?

(i) Building hotels [1]

.....

(ii) Egg collecting [1]

.....

(iii) Sea pollution [1]

.....

(b) Give **one** way in which the fishing industry could help more birds to survive. [1]

.....

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(c) Suggest reasons why

(i) some scientists think it is necessary to carry out conservation work to help the Blue Footed Booby; [1]

.....

(ii) some people think it is a good idea to encourage tourism. [1]

.....

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3. The diagram below shows the organisms in a food chain in an area. The energy present at each stage, at a given time, is shown in kilojoules (kJ).



grass snakes 88 kJ



frogs 1 600 kJ



slugs 12 000 kJ



lettuce 80 000 kJ

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(a) From the diagram:

(i) Name a carnivore. [1]

.....

(ii) Name the producer and state its source of energy [2]

Producer .....

Source of energy .....

(b) (i) From the diagram, complete the table to show the energy lost in this food chain. [1]

Stage in food chain	Energy loss calculation	Energy lost (kJ)
lettuce to slugs	80000 - 12000	68000
slugs to frogs	.....	.....
frogs to snakes	1600 - 88	1512

(ii) During which stage is the most energy lost? Underline the correct answer. [1]

lettuce to slugs

slugs to frogs

frogs to snakes

(c) State **one** way in which energy is lost from a food chain. [1]

.....

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4. *(a)* (i) Complete the equation for photosynthesis. [2]

carbon dioxide + ... ⟶ ..... + oxygen

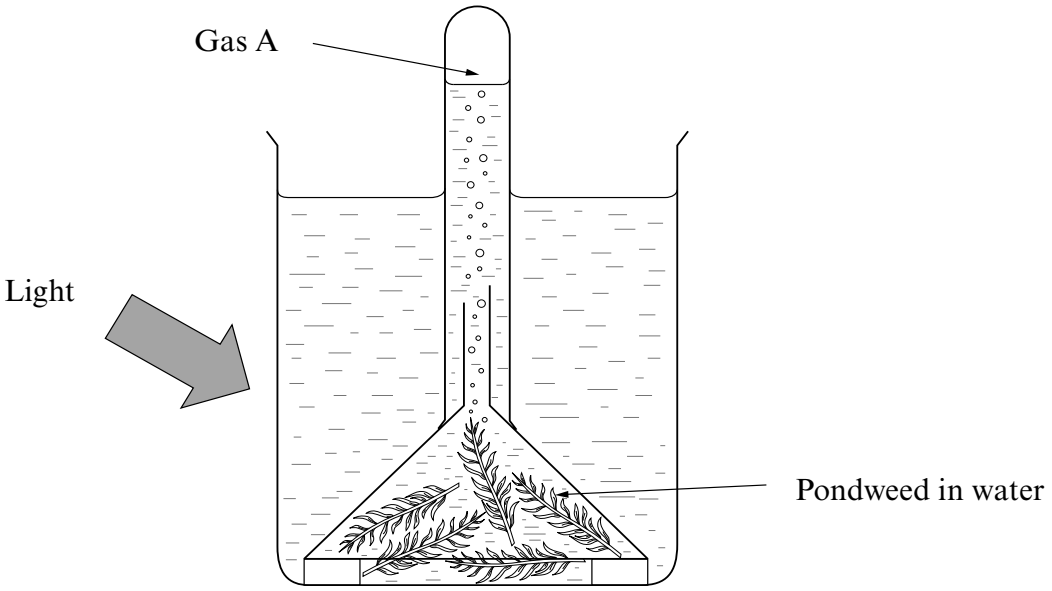
(ii) What is the function of chlorophyll in photosynthesis?
Underline the correct answer. [1]

to absorb carbon dioxide

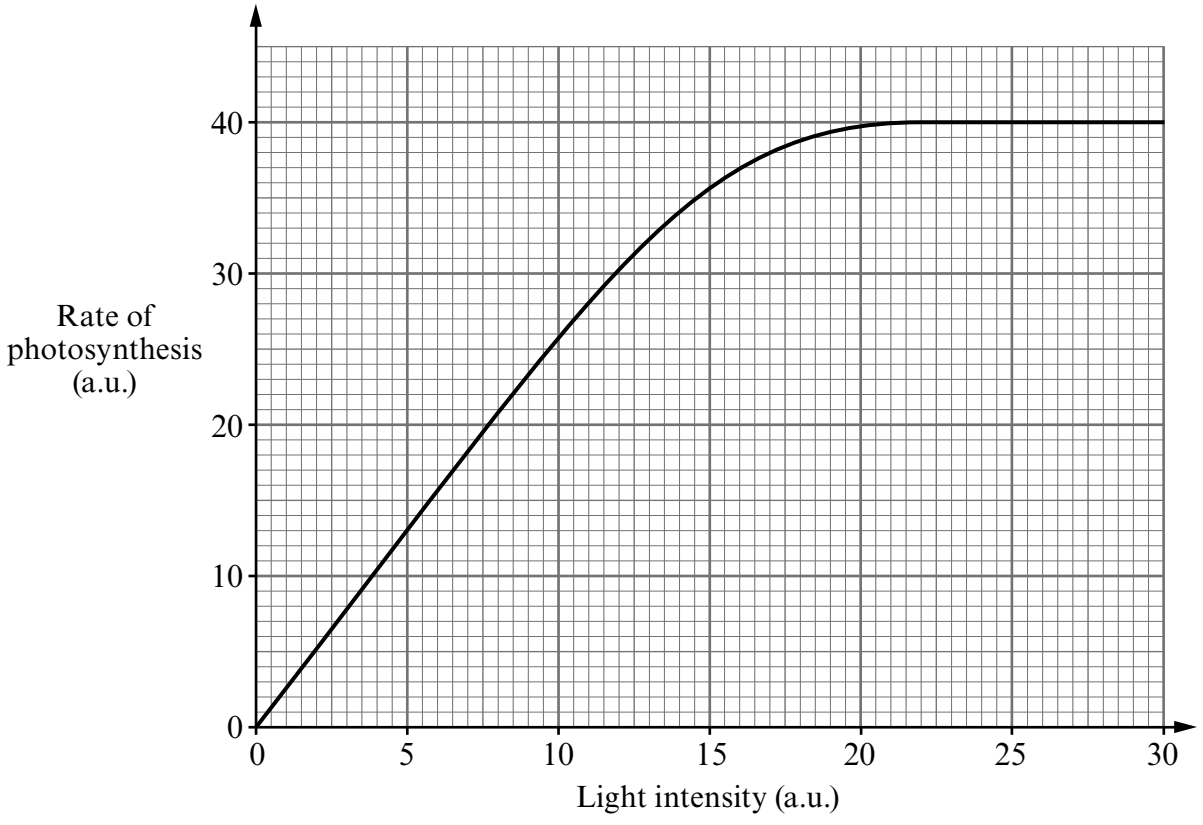
to absorb light

to absorb starch

(b) Students investigated the rate of photosynthesis at different light intensities using the apparatus below.



The graph below shows the results of the investigation



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(i) Name gas A shown on the diagram. [1]

.....

(ii) From the graph:

I Describe how the rate of photosynthesis changes as the intensity of light is increased. [1]

.....

.....

II State the rate of photosynthesis at a light intensity of 17 units. [1]

.....

.....

III Calculate the change in the rate of photosynthesis between light intensities of 10 and 17 units. Show your working. [1]

..... (a.u.)

(iii) How would the rate of photosynthesis be affected if the temperature decreased? [1]

.....

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5. *(a)* Complete the sentences using some of the terms below. [3]

protein chemical carbohydrate pH value

Enzymes are made of ..... .

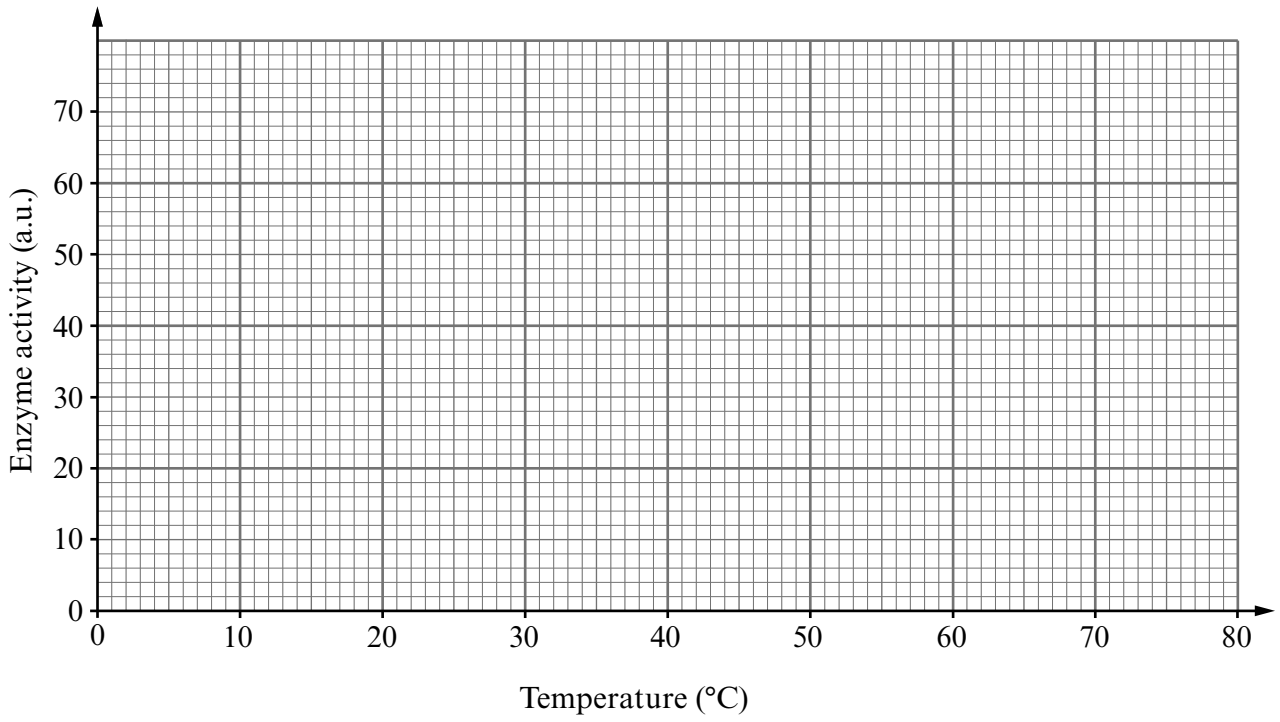
They control ..... reactions in living cells.

Each enzyme works best at a particular temperature and ..... .

(b) Scientists measured the activity of an enzyme at different temperatures. The results are shown below.

Temperature (°C)	Enzyme activity (a.u.)
10	15
20	34
30	67
40	62
50	46

Plot the results onto the graph below. Join the plots with a ruler. [3]



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(c) On the graph, continue your line to show the result you would expect for 70°C. [1]

(d) Explain how *boiling* affects the activity of an enzyme. [1]

.....

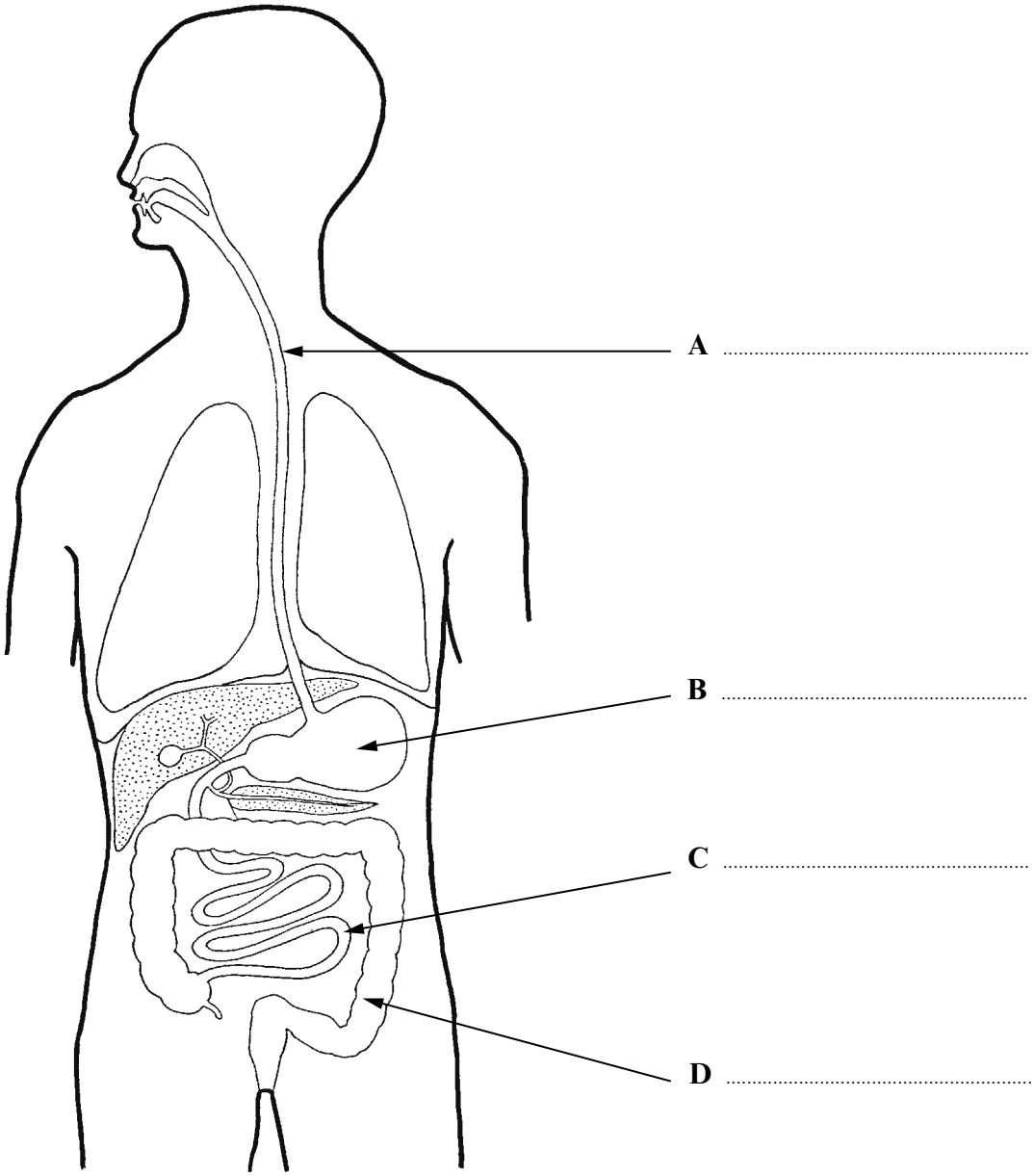
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6. The diagram below shows the human digestive system.



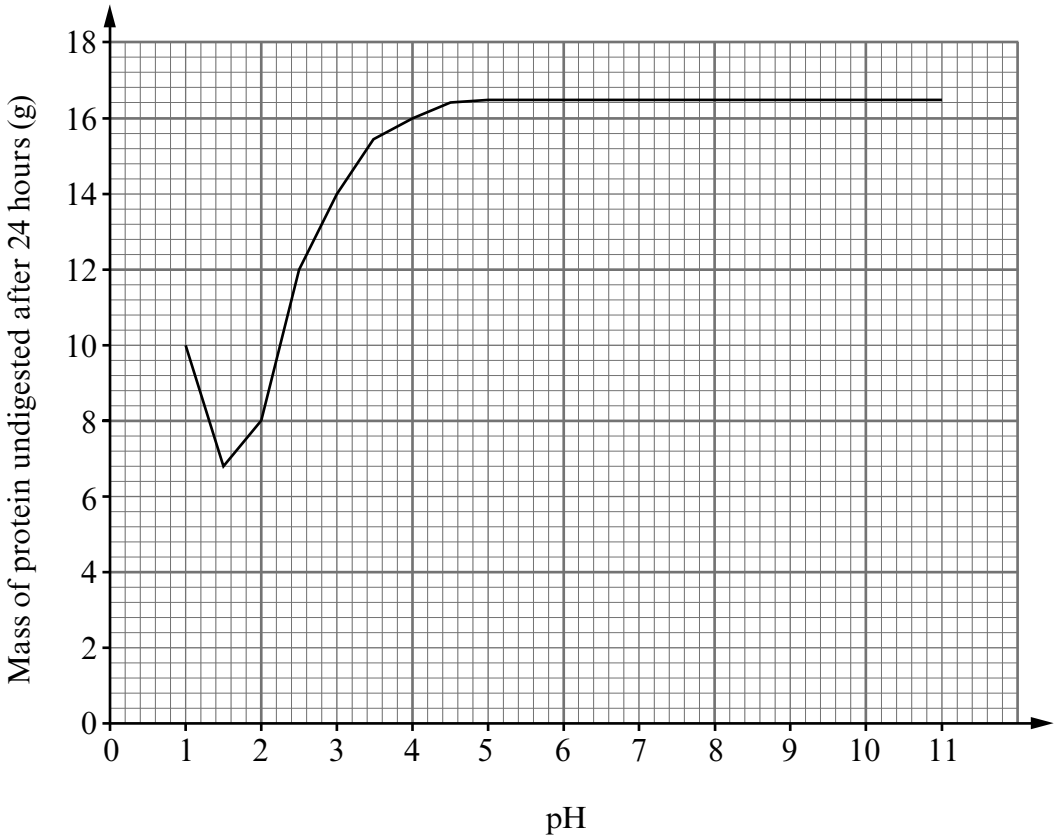
(a) Name the parts labelled **A** – **D** on the diagram. [4]

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(b) An investigation was carried out to find the mass of protein digested by a protease enzyme.
The mass of protein remaining undigested after 24 hours was recorded.
The experiment was repeated at different pH levels.
The results are shown in the graph.



(i) What is the optimum pH of this enzyme? [1]

.....

(ii) Name the organ where this enzyme can be found in the body. [1]

.....

(iii) Apart from time, state **one** *other* feature which should have been kept constant during this investigation. [1]

.....

7

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7. Japanese Knotweed is an alien species in the UK. The UK government spends many millions of pounds every year trying to eradicate the plant.

In Japan a small insect, *Aphalara itadoria*, eats Japanese Knotweed and therefore controls the spread of the plant. This insect has now been imported into the UK from Japan to control Japanese Knotweed. This is the first time that an insect has been licensed for the control of a pest species by the European Union.

Japanese Knotweed



Google Images

(a) What is meant by an alien species? [1]

.....

.....

(b) What term is used to describe the use of a living organism to control a pest species? [1]

.....

(c) Japanese Knotweed has caused serious damage to underground drainage, roads and buildings in the UK and Europe for over 50 years. Suggest why it took such a long time to approve the use of *Aphalara itadoria* for the control of Japanese Knotweed in the UK and Europe. [2]

.....

.....

.....

.....

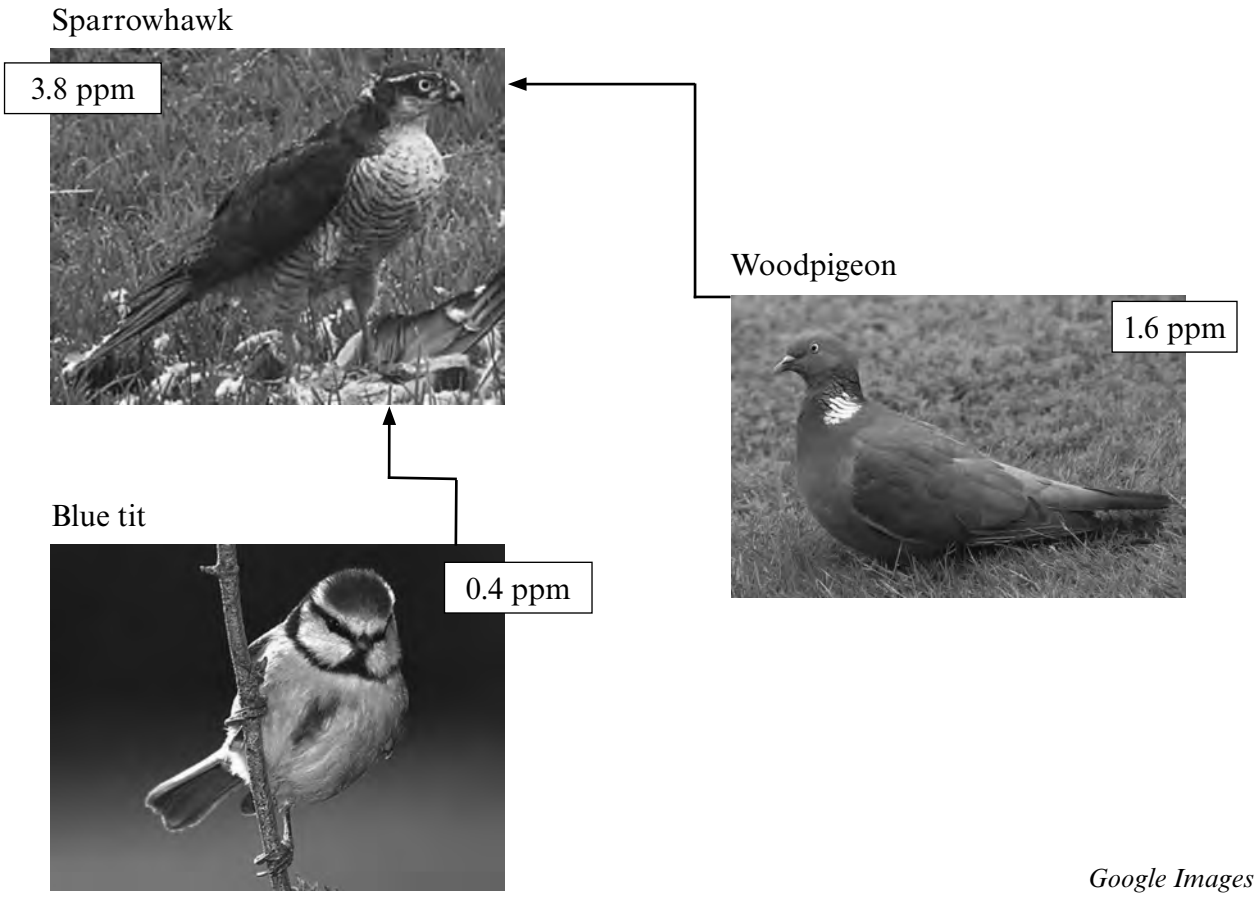
4

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8. The sparrowhawk feeds on woodpigeons and blue tits. Blue tits eat insects. Each photo includes the concentration of insecticide found in the flesh of each bird in parts per million (ppm) in Britain in 1965.



Google Images

(a) The woodpigeon eats only plants. Suggest how it has insecticide in its body. [1]

.....

.....

(b) The sparrowhawk feeds on woodpigeons and blue tits.

(i) Why does the sparrowhawk have a higher concentration of insecticide in its body than either the woodpigeon or the blue tit? [2]

.....

.....

.....

(ii) Sparrowhawks were often killed by the concentration of insecticide in their bodies but woodpigeons and blue tits were not. Explain the reason for this. [1]

.....

.....

.....

4

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GCSE MARKING SCHEME

SCIENCE - BIOLOGY (LEGACY)

SUMMER 2012

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INTRODUCTION

The marking schemes which follow were those used by WJEC for the Summer 2012 examination in GCSE SCIENCE - BIOLOGY (LEGACY). They were finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conferences were held shortly after the papers were taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conferences was to ensure that the marking schemes were interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conferences, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about these marking schemes.

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UNIT B2 (LEGACY)

FOUNDATION TIER

Question			Marking details	Marks Available
1.	(a)	(i)	A Cell membrane;	1
			B Nucleus;	1
			C Cytoplasm;	1
		(ii)	Any **two** from cell wall; chloroplast; vacuole;	2
	(b)	(i)	Stem;	1
		(ii)	Plants grow throughout life but animals grow to a definite size;	1
			Question total	**[7]**

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Question			Marking details	Marks Available
2.	(a)	(i)	Takes {land/area/ ground} needed {for breeding/ nesting/ laying eggs} NOT prevent breeding	1
		(ii)	There will be {less/ fewer} {eggs/ young/ baby birds}/ fewer eggs will hatch;	1
		(iii)	Kills/ reduces/ less/ fish needed for food; Accept No fish available for food Accept poisons birds.	1
	(b)		Decrease fishing / stop over-fishing/ limit fishing/ stop fishing;	1
	(c)	(i)	{Pollution / tourism / fishing} increasing; To prevent extinction/ being endangered; Help numbers increase or to prevent numbers declining; The numbers are decreasing;	1
		(ii)	Reference to an economic factor (More jobs / more money);	1
			Question total	**[6]**

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Question			Marking details	Marks Available
3.	(a)	(i)	Snake / frog;	1
		(ii)	Lettuce;	1
			Sun(light); NOT light alone	1
	(b)	(i)	12000 – 1600 **and** 10400;	1
		(ii)	Lettuce to slug; (allow e.c.f)	1
	(c)		Heat (qualified) e.g. from respiration / maintenance and repair of cells / waste materials or named waste material (as specification) NOT death/ decomposition	1
			Question total	**[6]**

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Question			Marking details	Marks Available
4.	(a)	(i)	Correctly Placed	
			Accept Words or correct formulae	
			Water;	1
			Glucose;	1
		(ii)	Absorbs light;	1
	(b)	(i)	Oxygen/ O_2;	1
		(ii)	I Increase <u>then</u> no change / steady/ level;	1
			NOT increase and stops	
			II Correct from <u>graph</u> – 38 (a.u);	1
			Not incorrect units	
			III Calculation consistent with II 38 (allow ECF) and graph (26/ 25.5)	1
			38-26=12	
			Or 38-25.5=12.5;	
		(iii)	Reduced / lower / decreased;	1
			Question total	**[8]**

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Question		Marking details	Marks Available
5.	(a)	Protein;	1
		Chemical;	1
		pH (value); correct cases	1
	(b)	All plots correct. +/- ½ small square ;;	2
		Deduct one mark for extrapolation	
		Line through centre of plots;	1
	(c)	Sketch line consistent with clear decrease in activity and must reach/ cross 70°C vertical;	1
	(d)	Denatures / destroys;	1
		NOT kills/ loses shape/ stops it working	
		Question total	**[8]**

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Question			Marking details	Marks Available
6/1	(a)		A – Oesophagus / gullet;	1
			B – Stomach;	1
			C – Small intestine/ ileum;	1
			D – Large intestine/ colon; Allow phonetic spelling	1
	(b)	(i)	(pH) 1.5;	1
		(ii)	Stomach;	1
		(iii)	Temperature / mass of protein <u>at start</u> / same protein / same volume / same mass or concentration of enzyme; NOT amount	1
			Question total	**[7]**

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Question		Marking details	Marks Available
7/2	(a)	A species {introduced/ brought in/ imported} from another country/ the introduction of a species not native to the country.	1
	(b)	Biological control/ biocontrol	1
	(c)	{Research/ tests / trials/ experiments} have to be carried out;	1
		To make sure that the species (biological control agent) {does not become a pest itself /doesn't harm non target species or humans} (OWTTE)/ to check species does not introduce disease.	1
		Question total	**[4]**

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Question			Marking details	Marks Available
8/3	(a)		Insecticide is on the {food/ plants/ crops} (that it eats).	1
	(b)	(i)	Sparrowhawk eats {<u>many/ lots of</u>} {pigeons / blue tits/ prey}; insecticide is {persistent / bioaccumulates / builds up in the body / not excreted/ not broken down}; NOT concentration increases/ more concentrated/ becomes concentrated	2
		(ii)	It reaches {<u>toxic/poisonous</u>} level in sparrowhawk (ORA)	1
			Question total	**[4]**
			TOTAL FOUNDATION TIER	**50**

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HIGHER TIER

Question		Marking details	Marks Available
4.	(a)	A Respiration; NOT anaerobic respiration	1
		B Photosynthesis;	1
		C Feeding/ eating;	1
	(b)	{Decomposers/ bacteria/ fungi} {feeding on / break down/ decompose/ putrefy/ decay/ rot} the bodies;	1
		Release {it/ carbon dioxide} during respiration;	1
		Decomposers respire producing carbon dioxide = 2	
		OR	
		Dead plants and/ or animals become fossilised;	
		{Combustion/ burning} of fossil fuels releases {carbon dioxide/ it};	
		Question total	**[5]**

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(b) (i) Not enough light available/ low light intensity; 1
Any reference to carbon dioxide being in low concentration negates a correct answer.

(ii) Photosynthesis is taking place at the maximum rate for the (concentration of) Carbon dioxide available/ CO_2 is {a/the} limiting factor/ not enough carbon dioxide available to increase the rate of photosynthesis; 1
(amount= neutral)
Any reference to light being the limiting factor negates a correct answer.

(c) Any **one** of: 1
Measure the volume /concentration/ number of bubbles of $\underline{O_2}$;
Measure volume of CO_2 taken up;
Measure the mass of starch / glucose produced
(NOT volume of water used/ any record of light used).
(NOT amount).

(d) Any **one** from: 1
Respired to provide energy/ respiration;
Converted/ changed to starch;
Used to make cellulose / proteins / lipids;
NOT cell walls/ growth and repair

Question total **[5]**

6. (a) Oystercatcher; 1

(b) Spire shell / clam / sandhopper; 3

crab / fish;

sandpiper / turnstone;

(c) (i) Sandpiper and turnstone; 1

(ii) Industry / factories/ relevant named industry e.g. paper mill; 1

Question total **[6]**

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Question			Marking details	Marks Available
7.	(a)	(i)	67/68 mg/100cm^3;	1
		(ii)	Anaerobic respiration;	1
		(iii)	Glucose;	1
	(b)		Oxygen debt has to be repaid/ paid back/ removed; to remove/ break down lactic acid;	2
			Question total	**[5]**

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Question		Marking details	Marks Available
8.	(a)	Light / temperature / pH; (amount = neutral)	1
	(b)	Useful up to a maximum concentration / can increase growth up to stated concentration (0.6); then does not increase growth / decrease growth/ kills plants above 0.6M/ kills plants at 0.8M;	2
	(c)	To show NITRATE causes growth; not SODIUM;	2
	(d)	Any 3 Overgrowth/ excess growth of plants or algal bloom and they die; Decayed/ decomposed by bacteria/ decomposers; Take in oxygen by respiration and the fish die;	3
		Question total	**[8]**

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Question		Marking details	Marks Available
9.	(a)	Osmosis (correct context); water passes out of {cells / eggs / animals]; from where it is in high concentration to low concentration/ down a gradient / from high to low water potential (must be clear that high concentration of water is inside newt); through {selectively / partially / semi} permeable membrane.	4
	(b)	{Make / provide/ choose} {new ponds / habitat/ safe area}; relocate newts;	2
		Question total	**[6]**
		TOTAL HIGHER TIER	**50**

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Surname	Centre Number	Candidate Number
Other Names		0

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GCSE

0239/01

ADDITIONAL SCIENCE
FOUNDATION TIER
BIOLOGY 2

A.M. TUESDAY, 24 January 2012

45 minutes

For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1.	**9**	
2.	**9**	
3.	**9**	
4.	**8**	
5.	**5**	
6.	**3**	
7.	**7**	
Total	**50**	

0239 010001

ADDITIONAL MATERIALS

In addition to this paper you may require a calculator and a ruler.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** questions.

Write your answers in the spaces provided in this booklet.

INFORMATION FOR CANDIDATES

The number of marks is given in brackets at the end of each question or part-question.

You are reminded of the necessity for good English and orderly presentation in your answers.

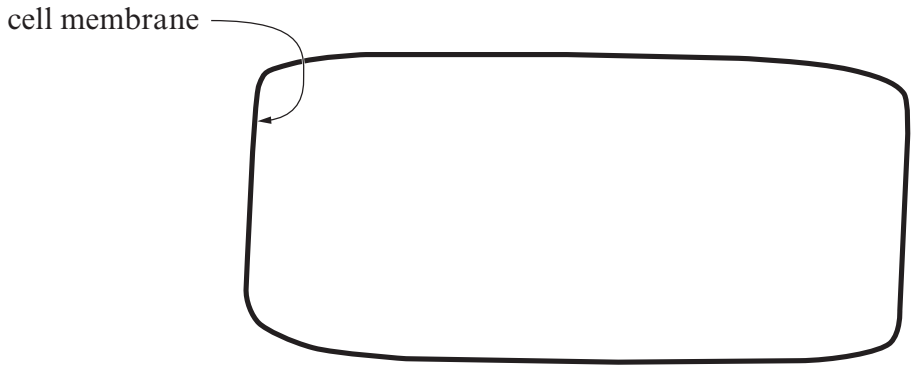
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Examiner only

Answer **all** *questions.*

1. The diagram shows the cell membrane in a plant cell.



(a) On the diagram, **draw** and **label** each of the following parts in their correct place:

vacuole, chloroplast, cell wall, nucleus. [4]

(b) Label the cytoplasm. [1]

(c) Which part of a plant cell:

(i) controls the entry and exit of molecules; [1]

.....

(ii) is the site of photosynthesis? [1]

.....

(d) Name any **two** of the labelled structures which are found in **both** plant and animal cells. [2]

.....

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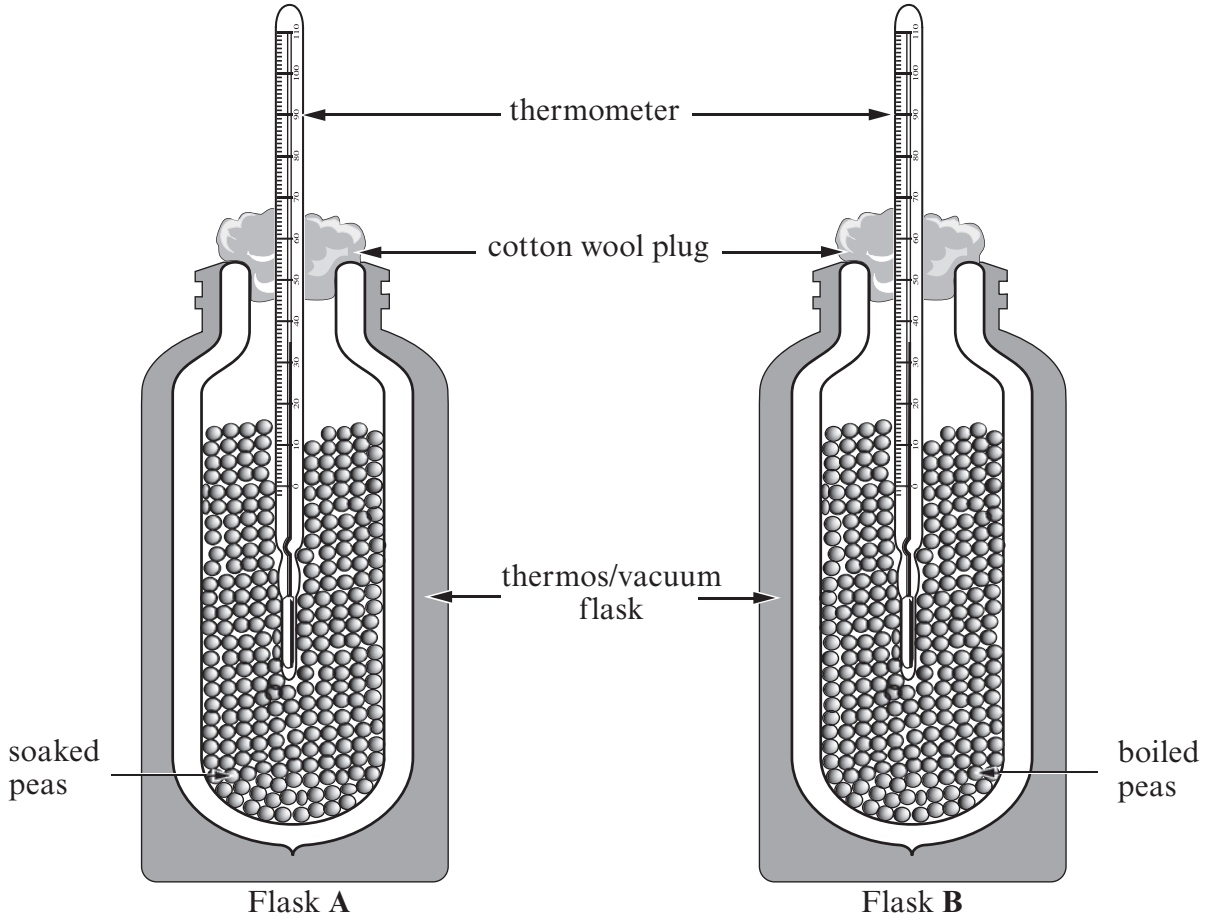
Examiner only

2. *(a)* Complete the equation for respiration using some words from the list below. [3]

carbon dioxide enzymes oxygen water

glucose + ... ⟶ ..... + ...

(b) The diagram shows an investigation into respiration in germinating pea seeds.



(i) Disinfectant is used in this investigation.

I. What is the purpose of using disinfectant? [1]

.....

II. In order to make the investigation a fair test, which **one** of the following procedures, **A** to **C**, should be used?

A disinfect the peas in flask **A** only
B disinfect the peas in flask **B** only
C disinfect the peas in both flasks **A** and **B**.

Procedure ..... [1]

III. State **one** way to make this investigation more reliable. [1]

.....

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(ii) Complete the following sentences by underlining the correct answer.

I. During the investigation, the temperature in flask **A** would

rise / fall / stay the same [1]

II. During the investigation, the temperature in flask **B** would

rise / fall / stay the same [1]

(c) Living organisms use energy from respiration for growth.
State **one** *other* use of the energy from respiration. [1]

.....

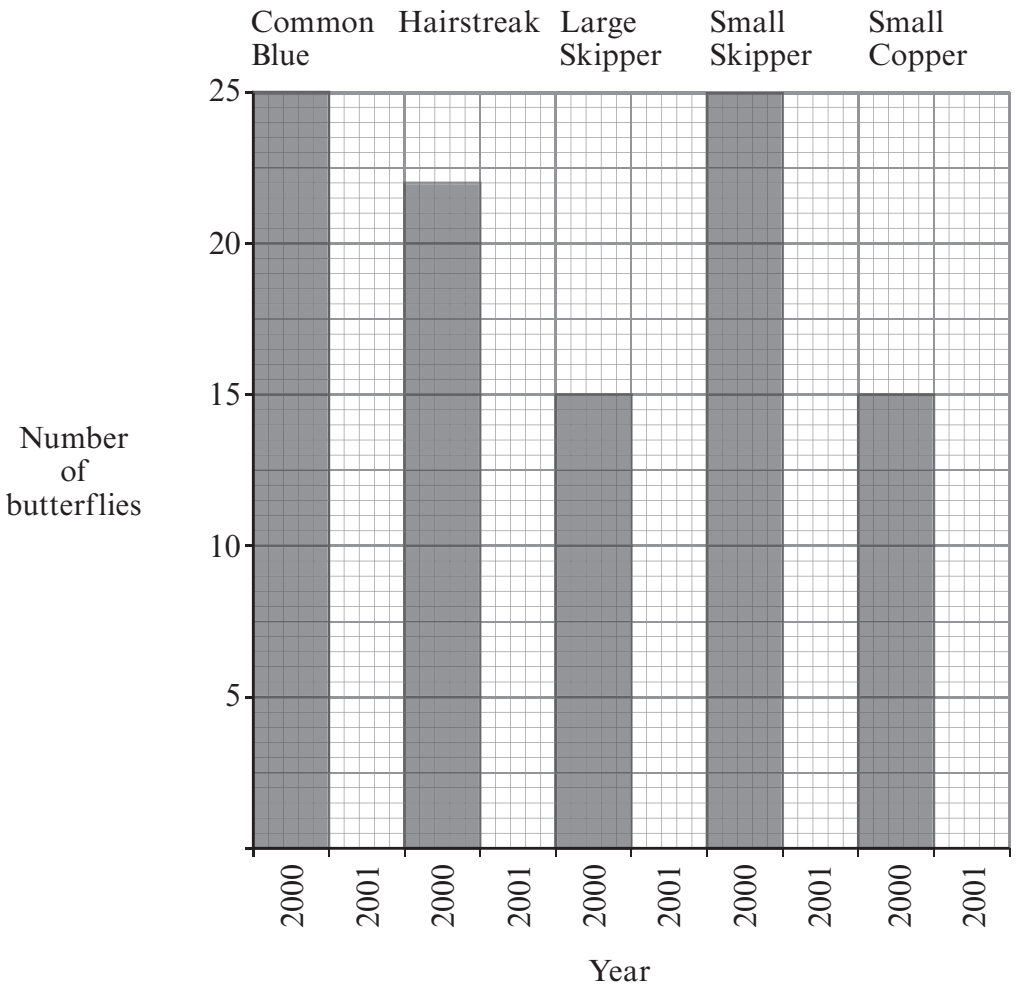
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Examiner only

3. The table shows the numbers of five species of butterflies found in an area of South Wales in 2000 and 2001.

Butterfly	2000	2001
Common Blue	25	17
Hairstreak	22	16
Large Skipper	15	14
Small Skipper	25	3
Small Copper	15	2
Total	102	52

(a) (i) The results for 2000 are shown in the bar chart below.
Use a ruler to plot a bar graph of the results for 2001. [2]



(ii) From the chart, name the **two** species with the greatest decrease in number. [2]

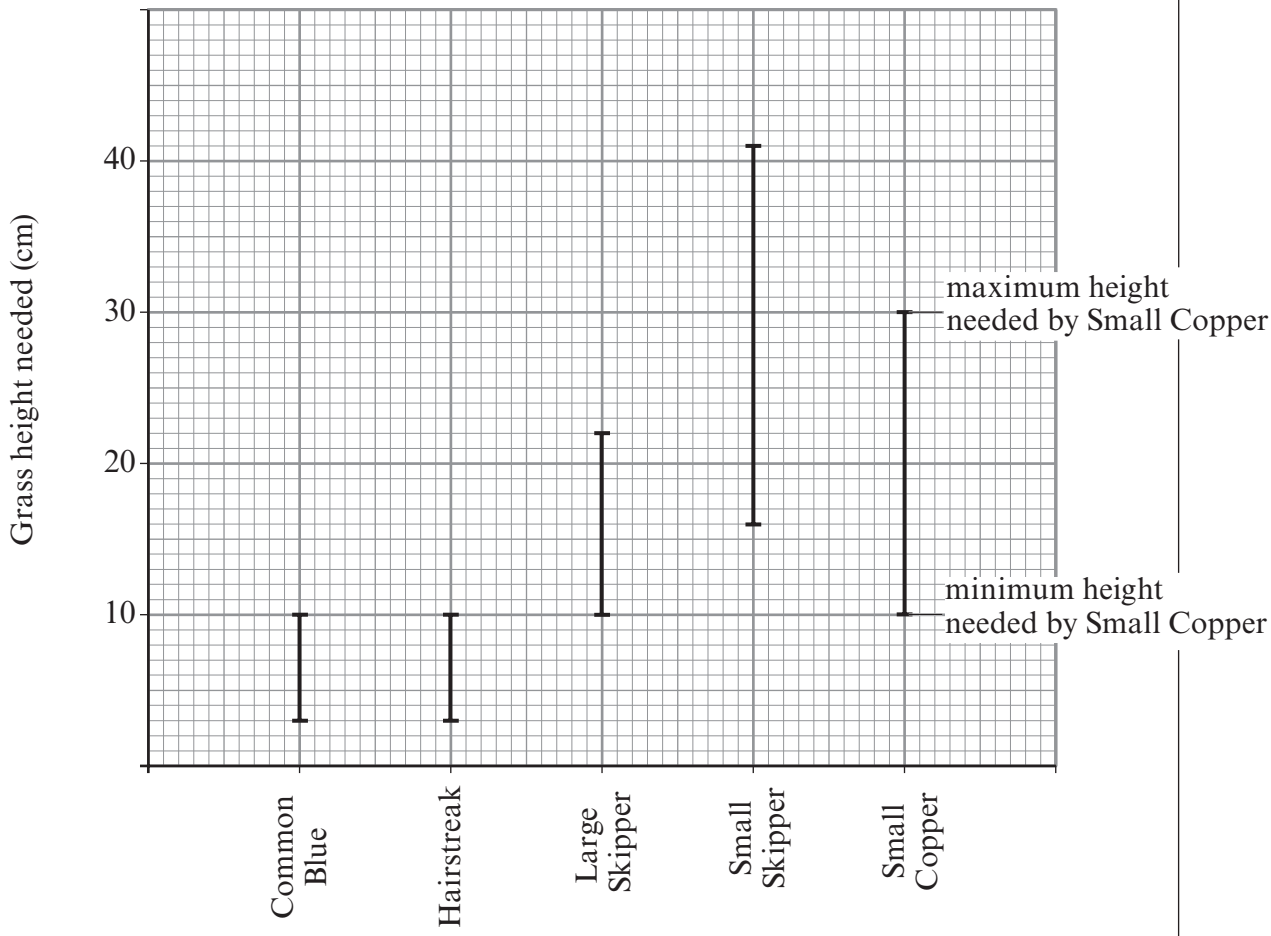
..... and .....

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(b) In 2000, the area was grassland. In 2001, the area became a golf course and the grass was cut short each week.

Some butterfly species need grass of particular heights.
The lines in the chart below show the range of grass heights needed by each butterfly species.



(i) Which **two** species need the shortest grass? [2]

..... and .....

(ii) Using the information in the chart, suggest an explanation for the steep decrease in the numbers of Small Skipper. [1]

.....

(iii) Suggest the height of grass which would be suitable for **most** butterfly species. [1]

..... cm

(c) Suggest **one** reason why the **total** numbers of all butterfly species decreased after the golf course was made. [1]

.....

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4. Read the information below about the body of a man, now known as Lindow Man, found in a marsh in Cheshire.

Lindow Man



BBC.co.uk

- The man died nearly 2000 years ago.
- The body and surrounding plant remains had not decayed because the marsh is acidic, with very little oxygen.
- The body was dried at the British Museum and put on display.
- The plant material in the marsh is called peat.
- In the past, peat was commonly used as a fossil fuel.
- Some gardeners add peat to the soil around their plants. The peat decays releasing nutrients into the soil for the plants to absorb, so aiding growth.

Use the above information and your own knowledge to answer the following questions.

(a) (i) Name **one** group of microorganisms that cause decay. [1]

.....

(ii) Give **two** reasons why the body of Lindow Man had not decayed in the marsh. [2]

I. .....

II. .....

(iii) How was the decay of Lindow Man prevented at the British Museum? [1]

.....

(b) (i) What was the common use for peat in the past? [1]

.....

(ii) Name the gas released when peat burns. [1]

.....

(c) Explain how peat helps garden plants to grow. [2]

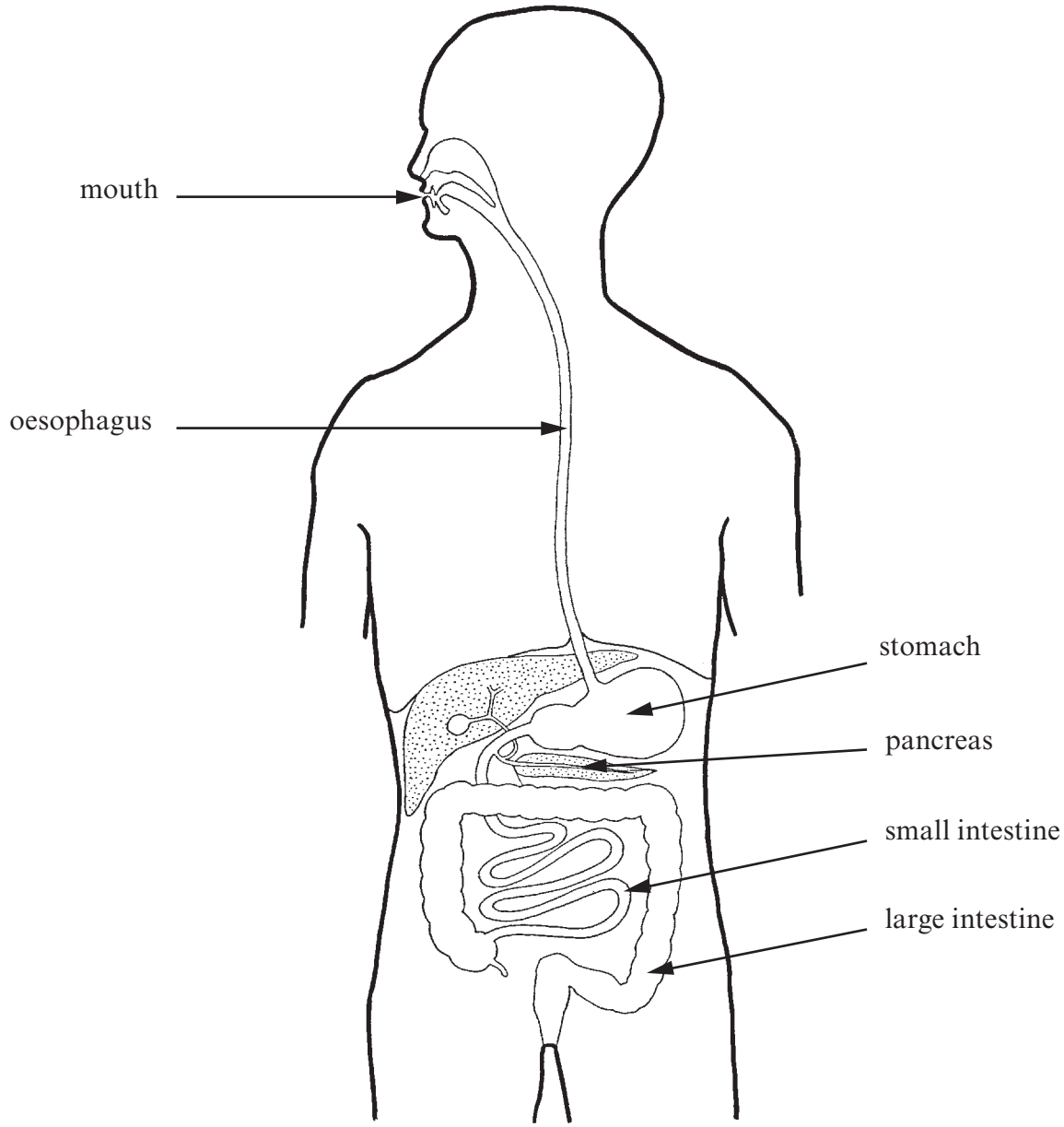
.....

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5. The diagram shows the digestive system.



(a) Write down the name of the organ from the diagram that best fits each description below.

(i) An organ that secretes lipases, proteases and carbohydrases. [1]

.....

(ii) The organ where fats are digested to fatty acids and glycerol. [1]

.....

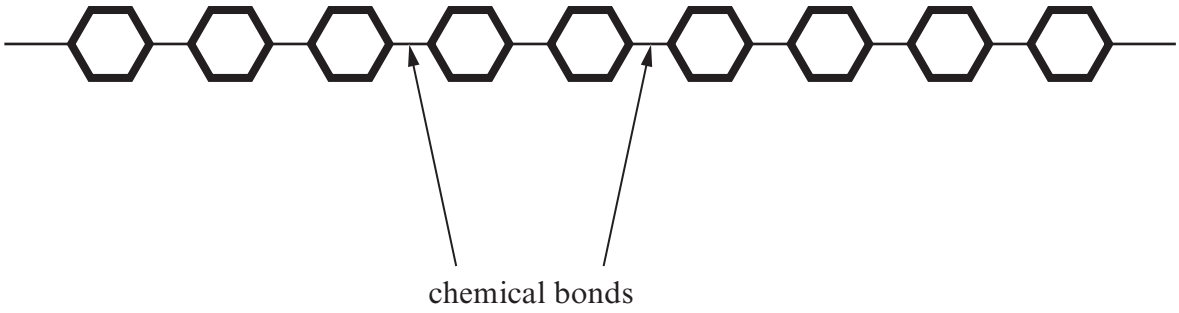
(iii) The organ where the digestion of starch begins. [1]

.....

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(b) The diagram below represents a short length of a starch molecule.



(i) Name the type of enzyme that digests the chemical bonds in the starch molecule. [1]

.....

(ii) Name the end product of starch digestion. [1]

.....

5

6. *(a)* What is meant by the term *biological control*? [2]

.....

.....

.....

(b) What name is given to a species of animal or plant which is introduced to an area where it has not previously lived? [1]

.....

3

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7. A commercial tomato grower was concerned that the temperature in his greenhouses was too high at certain times of the year. The high temperature was reducing the yield of tomatoes.

He experimented by using 7 greenhouses made of 'SMARTglass'. When an electric current is passed through 'SMARTglass' the percentage of light and heat, it lets in, changes. By adjusting the strength of the electric current, the 'SMARTglass' can let a varying percentage of light and heat into the greenhouse.

The experiment was allowed to run for a complete growing season.

The results of the experiment are shown in the table below.

	Greenhouse number						
	1	2	3	4	5	6	7
Light and heat allowed to pass (%)	0	30	40	50	60	70	80
Mean mass of tomatoes produced (kg/plant)	0.0	3.4	5.2	5.6	6.9	4.3	2.2

(a) (i) To obtain the largest mass of tomatoes, what percentage of heat and light is it best to allow to pass into the greenhouse? [1]

..... %

(ii) All the plants were given as much water as they needed.
Name **one** *other* factor, which affects the rate of photosynthesis, which should be kept the same for all the tomato plants. [1]

.....

(iii) When setting up this experiment suggest **two** *other* ways in which the tomato grower could have kept the experiment fair. [2]

I. .....

.....

II. .....

.....

(b) Explain fully why the yield of tomatoes in greenhouse number 2 was less than greenhouse number 5. [3]

.....

.....

.....

.....

.....

.....

7

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GCSE MARKING SCHEME

SCIENCE – BIOLOGY (LEGACY)

JANUARY 2012

INTRODUCTION

The marking schemes which follow were those used by WJEC for the January 2011 examination in GCSE SCIENCE – BIOLOGY (LEGACY). They were finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conferences were held shortly after the papers were taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conferences was to ensure that the marking schemes were interpreted and applied in the same way by all examiners.

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Unit	Page
B1 (Legacy)	1
B2 (Legacy)	14

UNIT B2 (LEGACY)

FOUNDATION TIER

Question			Answer	Mark
1.	(a)		one mark for each labelled structure in correct location; Vacuole – should occupy at least quarter of space Nucleus – bigger than chloroplast Cell wall - can be single or double line Labels should be unambiguous Deduct marks for nucleus and/ or chloroplast if inside the vacuole	4
	(b)		cytoplasm clearly indicated in correct location;	1
	(c)	(i)	membrane;	1
		(ii)	chloroplast;	1
	(d)		two from: (cell) membrane / cytoplasm / nucleus	2
			Total for Question	**9**

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Question			Answer	Mark
2.	(a)		oxygen;	3
			carbon dioxide + water; (either way round)	
			can use correct symbols	
	(b)	(i)	(I) kill/ destroy (NOT get rid of)bacteria / fungi / microorganisms;	1
			NOT germs	1
			(II) C:	1
			(III) repeat/ do it again NOT increase number of flasks	
		(ii)	(I) <u>rise</u> / fall / stay the same;	1
			(II) rise / fall / <u>stay the same;</u>	1
	(c)		Any suitable reference to life processes e.g. movement/ for exercise / repair / cell division/ excretion/ reproduction/ sensitivity/ feeding or digestion/ maintain body temperature/ keeping warm (not: growth / photosynthesis/ heat energy alone/ catch food/ eat food)	1
			Total for Question	**9**

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Question			Answer	Mark
3.	(a)	(i)	all plots correct; tolerance +/- ½ small square, Allow just top of bar drawn/ not shaded. (one error minus 1)	2
		(ii)	Small Skipper; Small Copper, (either order)	2
	(b)	(i)	Common Blue; Hairstreak; (either order)	2
		(ii)	The grass was cut (too low)/ needed longer or higher grass/ grass is too short NOT grass wrong height/ not enough grass/ need a lot of grass	1
		(iii)	10;	1
	(c)		such as: trampling / people walking/ pesticide/ reference to change in habitat/ moved to different habitat/ grass too short/ grass cut below 3cm; NOT moved (alone), scared away	1
			Total for Question	**9**

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Question			Answer	Mark
4.	(a)	(i)	bacteria / fungi;	1
		(ii)	acid;	2
			little oxygen; (either order)	
			NOT no oxygen, microbes need oxygen to decay	
		(iii)	dried;	1
	(b)	(i)	(fossil)fuel / burnt to provide heat (burning qualified)	1
		(ii)	carbon dioxide/ CO_2;	1
	(c)		decays;	2
			nutrients absorbed by plants;	
			Total for Question	**8**

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FOUNDATION & HIGHER TIER

Question			Answer	Mark
5/1	(a)	(i)	Pancreas/ small intestine	1
		(ii)	small intestine	1
		(iii)	mouth	1
	(b)	(i)	carbohydrase / amylase (spelling must end in –ase)	1
		(ii)	glucose NOT simple sugar (can be neutral)	1
			Total for Question	**5**

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Question		Answer	Mark
6/2	(a)	use of {(a living) organism / predator / natural enemy/ animal}/ introduce a species;	1
		to feed off / reduce / kill a (crop) pest / alien species	1
		Correct use of example = 2 marks	
	(b)	Alien/ exotic (species)	1
		Total for Question	**3**

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Question			Answer	Mark
7/3	(a)	(i)	60	1
		(ii)	CO_2/ carbon dioxide (amount = neutral)	1
		(iii)	any two from:	2
			same size greenhouse/ same number plants / same spacing / same aspect or greenhouses face same direction/ same variety or type of plants / same age or mass or size of plants / same mineral feed or nutrients / same ventilation / same soil or mass of soil	
			Accept carbon dioxide if not used in (ii) (ECF)	
			NOT same temperature/ same greenhouse/ same glass/ amount of	
	(b)		plants had insufficient or not enough light / heat/ ORA	1
			so less photosynthesis/ reduced rate of photosynthesis	1
			NOT not as easy to photosynthesise or quicker/slower photosynthesis	
			so less food / glucose (for tomato growth)	1
			NOT less energy or les fruit produced	
			Total for Question	**7**

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HIGHER TIER

Question		Answer	Mark
4	(a)	cell wall correctly drawn & labelled (must be double line)	1
		vacuole correctly drawn & labelled	1
		(deduct if contains nucleus/mitochondria)	1
		chloroplast(s) correctly drawn & labelled in cytoplasm	
		deduct one mark for each incorrect label	
	(b)	any one from:	1
		plant tissue can regenerate from stem / undifferentiated cells more so than animal tissue/ easier for plants to regenerate from stem cells	
		animals tend to grow to a finite size (more so than plants)/ animals have a maximum size that they grow to (OWTTE)	
		plant growth occurs from (restricted growth areas) meristems/ plants have branching growth or animals have a compact growth	
	(c)	repair / replacement of damaged tissues / organs/ cells (accept named tissue such as tendons/ trachea/ retina/ heart) to treat Parkinson's/ arthritis/ AVP	1
		NOT cure disease	
		Total for Question	**5**

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Question		Answer	Mark
5.	(a)	at 20^0C or at lower temperature (enzyme and protein) molecules are moving slower/ ORA	Any 3
		therefore fewer collisions or description of fewer collisions or fewer reactions/ ORA	
		fewer protein molecules broken down / digested or fewer amino acids produced / less digestion/ ORA	
		fewer amino acid molecules move/ go into side B. NOT time taken	
		(3 from 4)	
	(b)	At 90^0 or higher temperature enzyme denatured or destroyed/ ORA	1
		fewer reactions / fewer amino acids produced/ less digestion/ ORA	1
		NOT slower/ rate of reaction decreases	
		Total for Question	**5**

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Question			Answer	Mark
6.	(a)		Arrows from pipit and larvae to kestrel.	1
	(b)	(i)	more <u>foxes</u> and/ or <u>golden eagles</u> would eat the (increasing) hare (population because they would not have grouse to eat.)	1
		(ii)	more heather or food (for hares to eat.)/ less competition for food/ heather	1
	(c)		Correct order clockwise = D, B, A, C	4x1
			Total for Question	**7**

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Question			Answer	Mark
7.	(a)	(i)	100	1
		(ii)	5	1
	(b)		More <u>haemoglobin</u>/ higher than normal haemoglobin NOT RBC	1
			More oxygen (carried)	1
			<u>More</u> AEROBIC respiration/ respire aerobically for longer	1
			<u>Less</u> anaerobic respiration.	1
			Total for Question	**6**

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Question			Answer	Mark
8.	(a)		Water passes out or is lost/ plant is dehydrated	1
			by osmosis	1
			from higher concentration to lower concentration (must be show clear direction)	1
			through selectively or semi or partially permeable membrane	1
			NOT SPM	
			(No marks if refer to solutions moving rather than water)	
	(b)	(i)	Active transport/ uptake	1
		(ii)	Oxygen/ O_2	1
			Glucose.	1
			NOT ATP	
			Total for Question	**7**

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Question	Answer	Mark
9.	Overgrowth of algae/ algal bloom/ rapid growth of plants or algae	1
	Plants /algae/ producers die.	1
	Because of lack of light/ light blocked out	1
	and decay/ decomposes	1
	Bacteria or fungi or decomposers use oxygen.	1
	NOT microbes/ micro-organisms	
	for respiration	1
	aerobic life / fish die / suffocate	1
	Any 5x1	
	Total for Question	**5**

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Candidate Name	Centre Number	Candidate Number
		0

WJEC CBAC

GCSE

239/01

ADDITIONAL SCIENCE
FOUNDATION TIER
BIOLOGY 2

P.M. THURSDAY, 19 May 2011

45 minutes

For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1	**7**	
2	**10**	
3	**6**	
4	**7**	
5	**5**	
6	**4**	
7	**5**	
8	**6**	
Total	**50**	

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ADDITIONAL MATERIALS

In addition to this paper you may require a calculator and a ruler.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** questions.

Write your answers in the spaces provided in this booklet.

INFORMATION FOR CANDIDATES

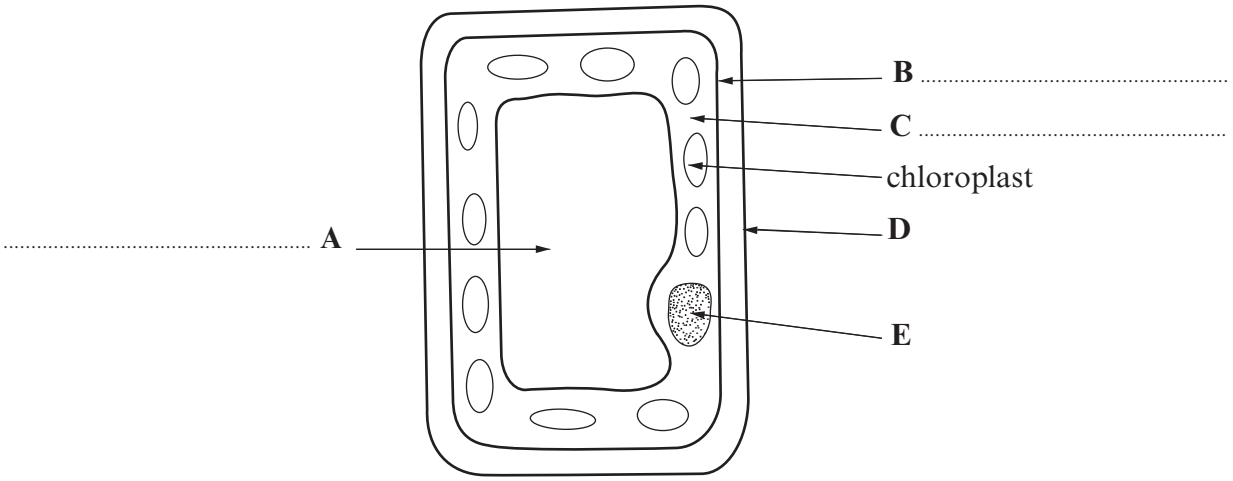
The number of marks is given in brackets at the end of each question or part-question.

You are reminded of the necessity for good English and orderly presentation in your answers.

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Answer **all** *questions.*

1. *(a)* The diagram shows a plant cell.



(i) On the diagram, label **A**, **B** and **C** using some of the words below. [3]

vacuole	cell wall	nucleus	cell membrane	cytoplasm

(ii) State the function of the chloroplast. [1]

.....

(iii) From the diagram, give the **letters** of **two** structures, other than the chloroplast, which are **not** present in animal cells. [2]

.....

(b) Which process allows damaged cells and tissues to be replaced? [1]

.....

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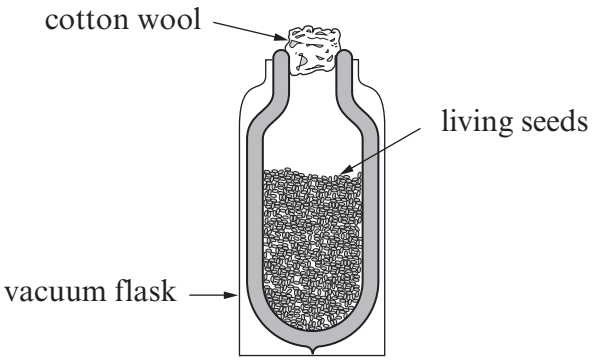
Examiner only

2. *(a)* Complete the sentence by using some of the words below. [3]

enzymes	energy	chemical	light

During respiration in living cells ..... is released from ..... reactions which are controlled by .....

(b) A scientist carried out an experiment. Using a thermometer, she recorded the temperature of living seeds in a flask for 9 days.



(i) Complete the diagram by drawing a thermometer in its correct place and labelling it. [1]

(ii) Why was it important that she used a vacuum *(Thermos)* flask? [1]

.....

(iii) Why was cotton wool used instead of a rubber stopper? [1]

.....

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(c) The results of the experiment in *(b)* are shown in the table below. The temperature increased.

Day of experiment	Temperature °C
1	20
3	24
5	39
7	43
9	46

(i) Between which days did the temperature increase most quickly? Circle the correct answer. [1]

Days 1–3 days 3–5 days 5–7 days 7–9

(ii) What process in the living seeds caused the temperature to increase? [1]

.....

(iii) At the same time, the scientist set up another identical flask containing dead seeds and some disinfectant. What was the purpose of this flask and what results would be expected? [2]

Purpose .....

.....

Expected results .....

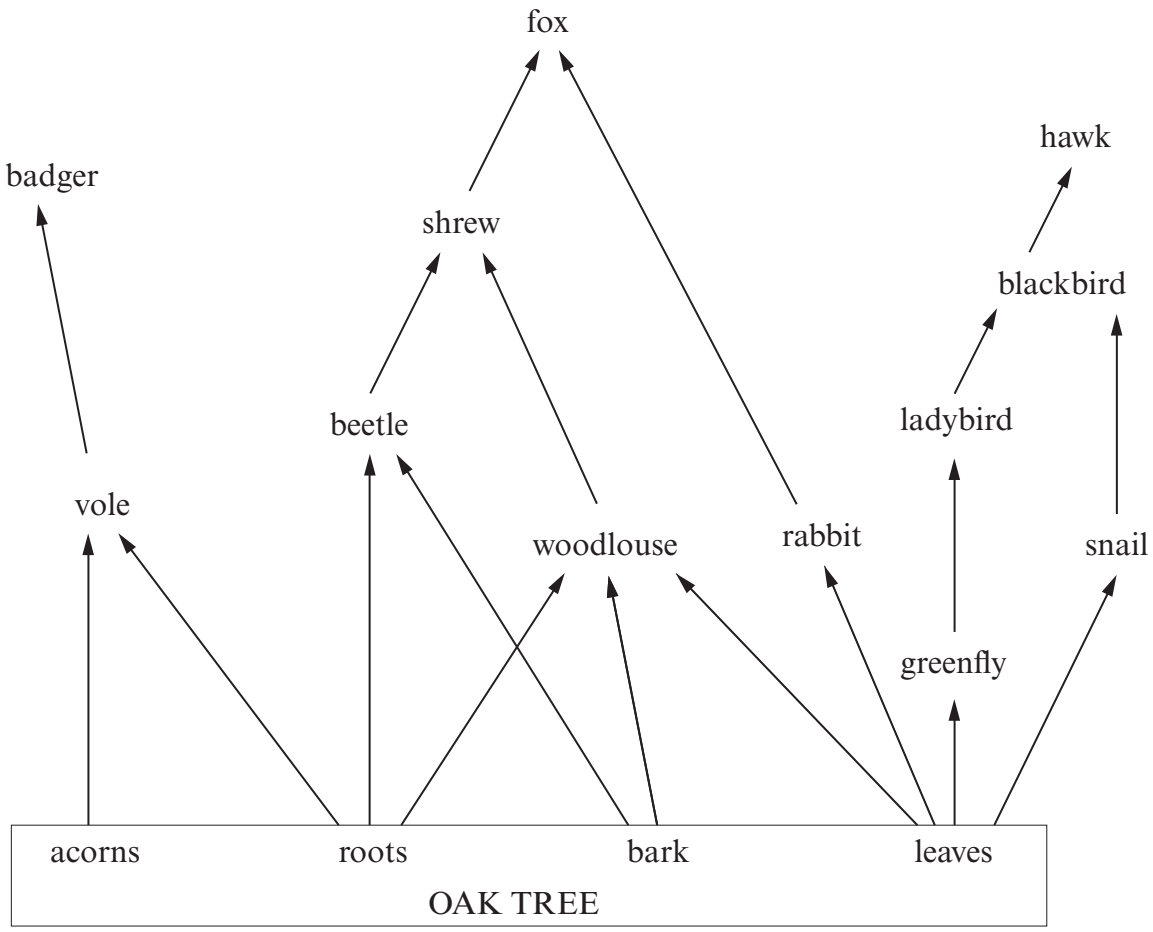
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3. The diagram shows part of a food web in a woodland.



Using **this information**, answer the following questions.

(a) The producer in this food web is the oak tree.

(i) What is the source of energy for the tree? [1]

.....

(ii) What do the arrows on the diagram show? [1]

.....

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(b) (i) Which part of the oak tree supports the greatest number of different first stage consumers (herbivores)? Circle your answer. [1]

acorns roots bark leaves

(ii) Name a carnivore and give **one** example of what it eats. [1]

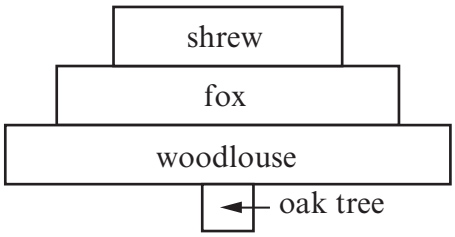
Carnivore .....

Food .....

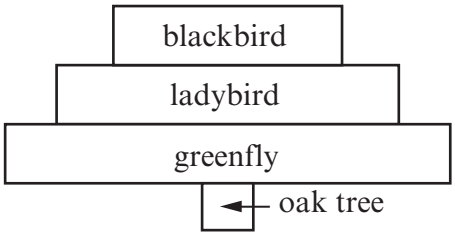
(iii) Name **one** *third stage* (tertiary) consumer. [1]

.....

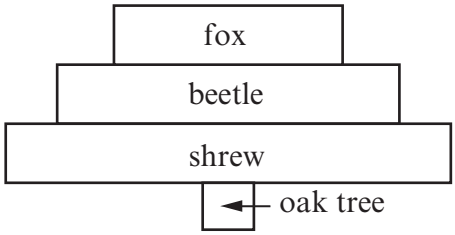
(c) A student drew some pyramids of numbers from food chains in the food web. Place a tick (✓) in the box for the **one which is correct**. [1]



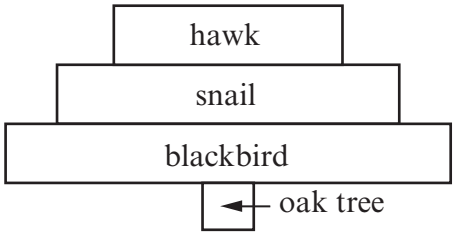
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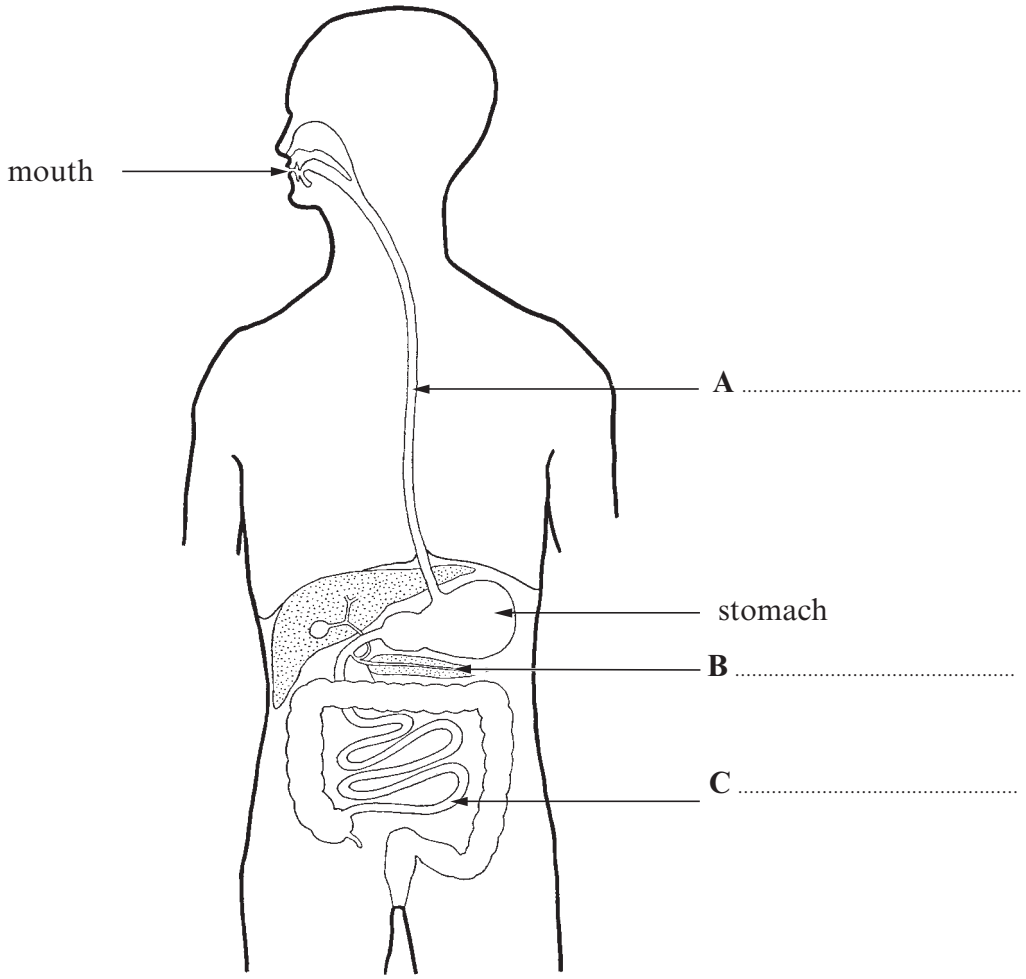
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4. *(a)* The diagram below shows the human digestive system. Label **A**, **B** and **C** on the diagram. [3]



(b) Complete the table below. [2]

Part of digestive system	Class of food which is digested (starch, protein or fat)
mouth	
stomach	

(c) Amino acids and glucose are produced by digestion. State **one** use of each in the body. [2]

(i) Amino acids .....

(ii) Glucose .....

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5. Read the following information about bird conservation.

- In 1980 the Kingfisher was an endangered species in a part of South Wales. Conservation workers set up nest places and perches near rivers. They also helped to reduce river pollution. In 2006 there were 6000 birds, five times more than 1980.
- In the North of England, the Sea Eagle had died out by 1918. Conservationists introduced a few from another country in 1950 and breeding was very successful.



Google images

Kingfisher feeding

Using **this information only**:

(a) (i) Why is it very important for Kingfishers that their river water is not polluted? [1]

.....

(ii) Give **one** example of conservation work, *other than* reducing pollution which helped Kingfishers. [1]

.....

(iii) How many Kingfishers were there in 1980? Show your working. [1]

Answer .....

(b) (i) After Sea Eagles had disappeared, how long was it before conservation work started? [1]

.....

(ii) What evidence is there that the number of Sea Eagles has increased because of conservation? [1]

.....

5

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6. Rhys, Angharad and their parents were very excited when they went whale watching from a high powered motor boat.
Rhys said "We got so close to the whales that we even managed to get in between a mother and its calf".



Google images

(a) Suggest **two** harmful effects that this type of ecotourism could have on the whales. [2]

(i) .....

.....

(ii) .....

.....

(b) Ecotoursim also occurs in the Manu Biosphere Wildlife Reserve in Peru. This reserve is a good example of a sustainable use of wildlife.

(i) Explain the meaning of sustainable use of wildlife. [1]

.....

.....

(ii) Suggest **one** benefit that ecotourism in the Manu Biosphere Wildlife Reserve has on the local communities. [1]

.....

4

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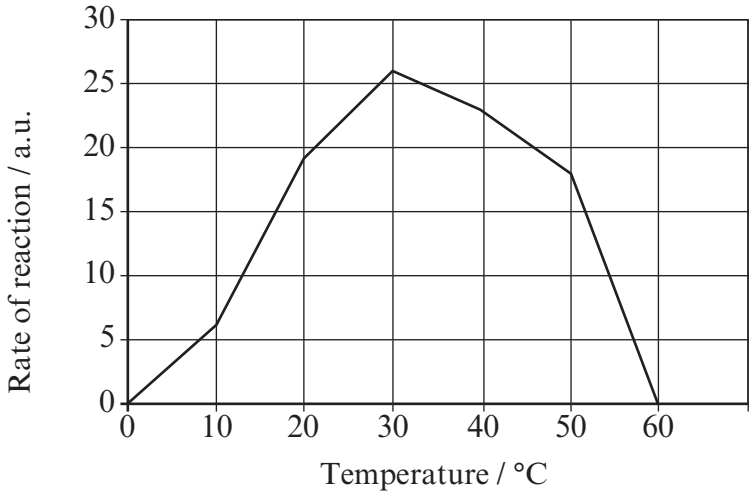
7. *(a)* What is an enzyme? [2]

.....

.....

.....

(b) An investigation was carried out in a school laboratory into the effect of temperature on the breakdown of starch by the enzyme amylase.
The results of the investigation are shown in the graph below.



From the graph:

(i) **Describe** the effect of temperature, above 30°C, on the amylase. [1]

.....

.....

(ii) **Explain** the effect of temperature, above 30°C, on the amylase. [1]

.....

.....

(c) State **one** factor which should be kept constant during this investigation. [1]

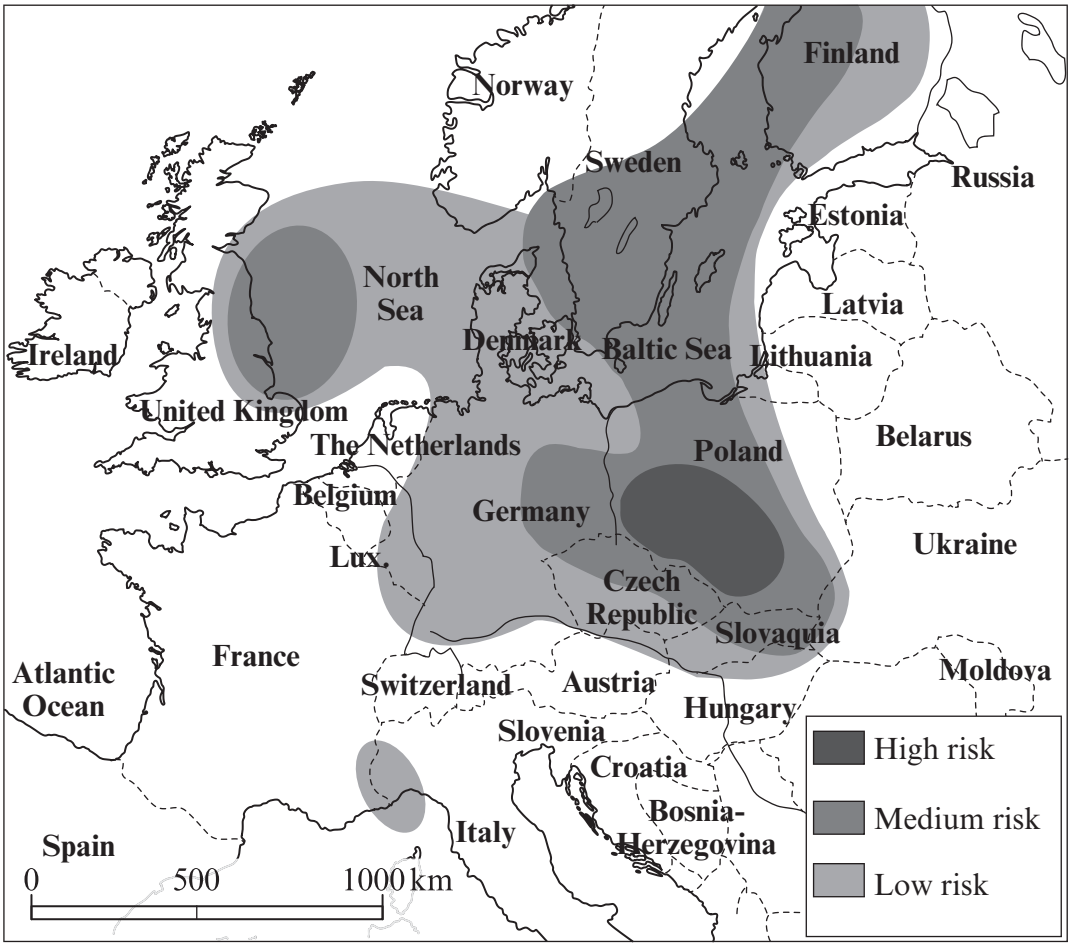
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(Questions continue overleaf)

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8. The map shows the regions of Europe which are most at risk from acid rain.



(a) Which country and sea are most at risk from acid rain? [2]

Country .....

Sea .....

(b) Acid rain forms when gases such as carbon dioxide (CO_2) and sulphur dioxide (SO_2) dissolve in water in the atmosphere.

(i) Name the process that releases these gases. [1]

.....

(ii) Name the source of these gases. [1]

.....

(c) State **two** effects of acid rain on the environment and living organisms. [2]

.....

.....

.....

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Candidate Name	Centre Number	Candidate Number
		0

WJEC CBAC

GCSE

239/01

ADDITIONAL SCIENCE
FOUNDATION TIER
BIOLOGY 2

A.M. THURSDAY, 13 January 2011

45 minutes

For Examiner's use only		
Question	**Max. Mark**	**Mark Awarded**
1	**10**	
2	**8**	
3	**6**	
4	**11**	
5	**6**	
6	**5**	
7	**4**	
Total	**50**	

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ADDITIONAL MATERIALS

In addition to this paper you may require a calculator and a ruler.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** questions.

Write your answers in the spaces provided in this booklet.

INFORMATION FOR CANDIDATES

The number of marks is given in brackets at the end of each question or part-question.

You are reminded of the necessity for good English and orderly presentation in your answers.

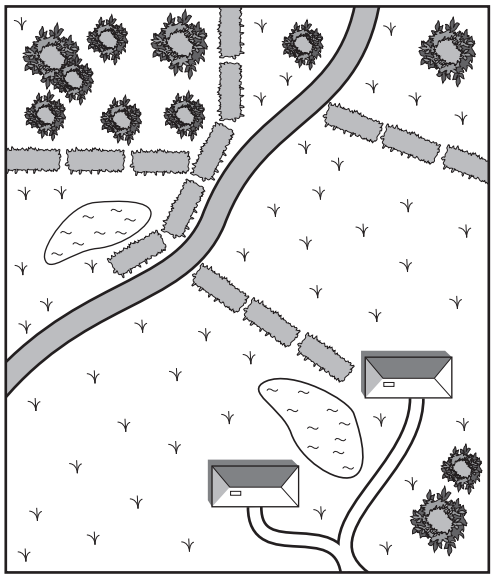
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Answer **all** *questions.*

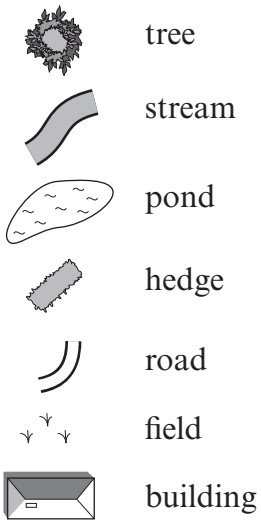
1. The human population of the world is increasing quickly.
Farming methods have changed so that more people can be fed.

(a) The maps show the same area of farmland 100 years ago and as it is today.

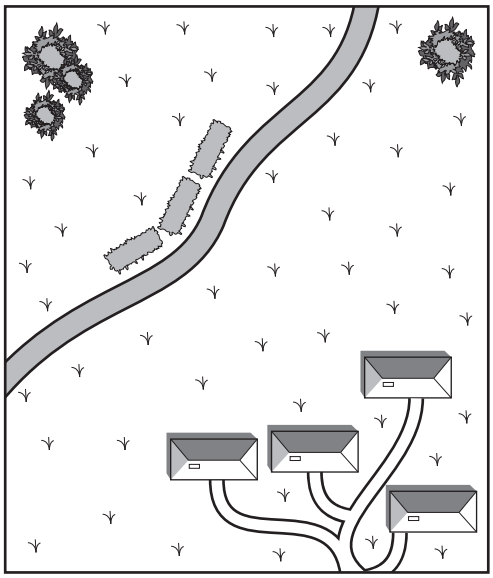
Farmland 100 years ago



Key:



Farmland today



(i) What has happened to the size of the fields? [1]

.....

(ii) State **three** *other* ways in which the farmland has changed. [3]

I. .....

II. .....

III. .....

(iii) Suggest what has happened to the variety of wildlife in the farmland. [1]

.....

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(b) Complete the sentences below using some of the words from the list: [5]

pesticides chains insects heavy metals fertilisers minerals

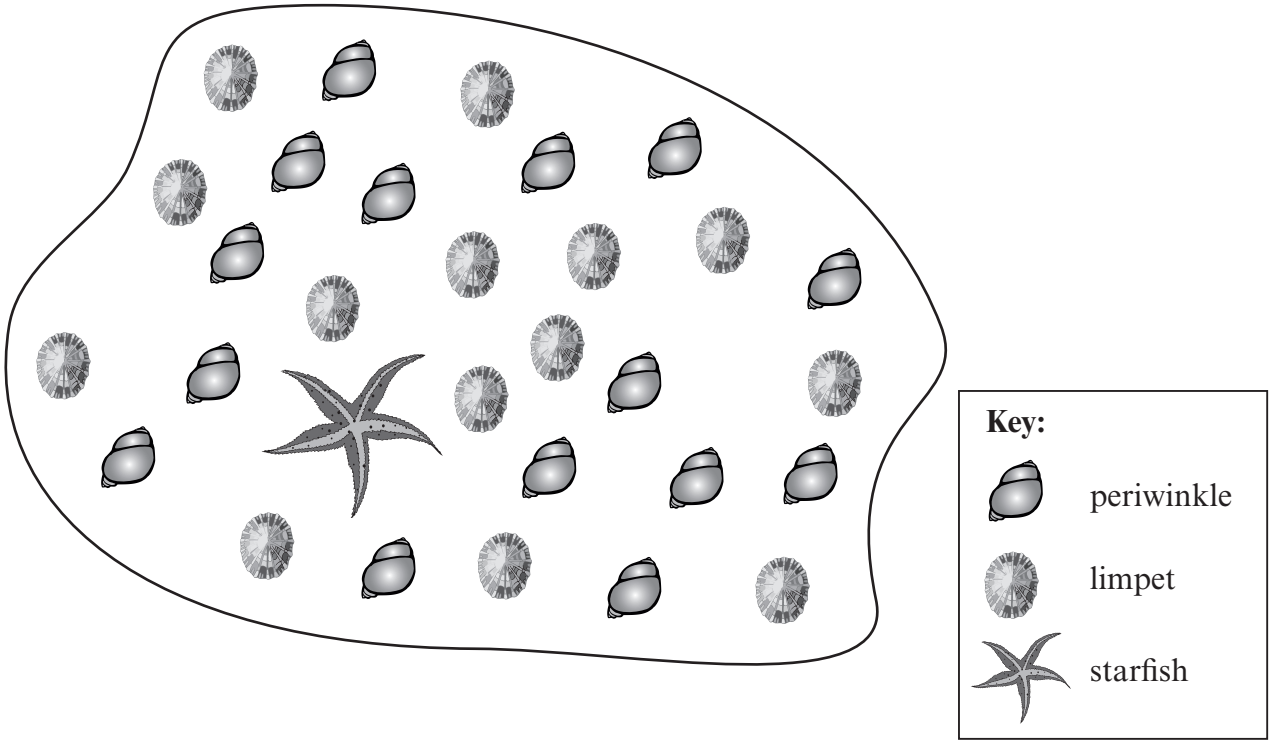
Farmers use ..... to kill ..... and other pests that destroy crops. The use of these chemicals can disturb food ..... . Farmers use ..... to replace ..... lost from the soil.

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2. Isabel carried out a rock pool study on the seashore.
She counted the number of plants and animals.
Only the animals are shown in the pool below.



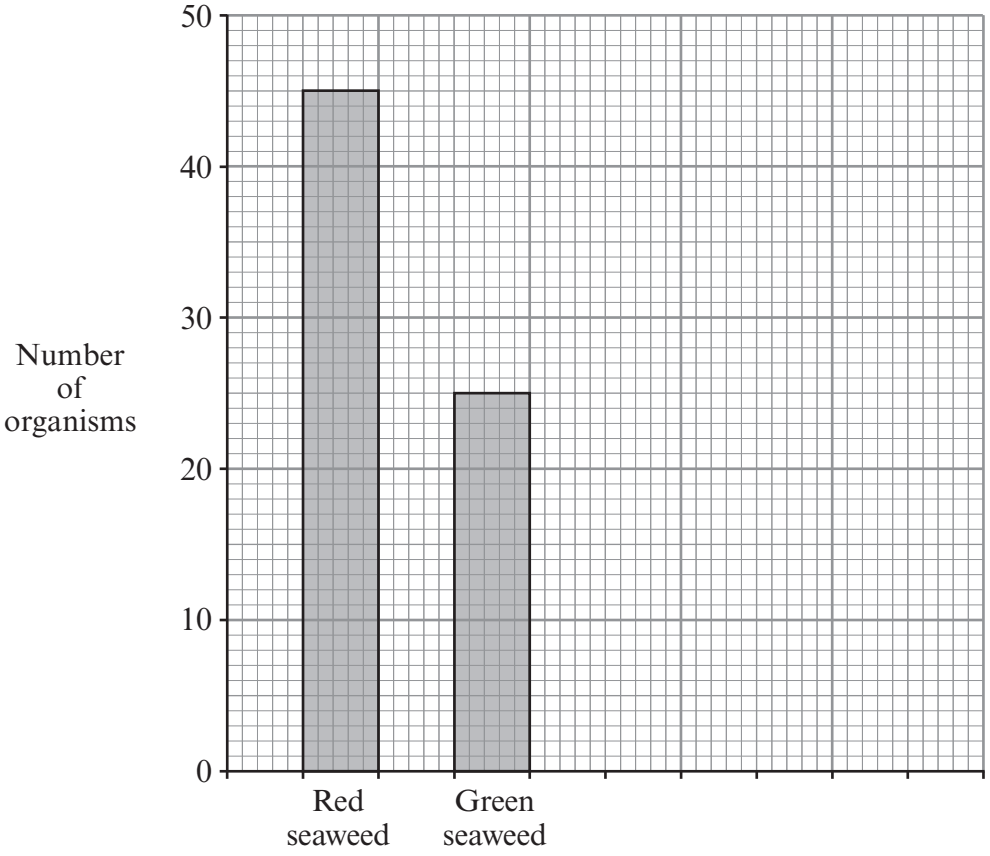
(a) (i) Complete the table to show the number of animals. [2]

Organisms	Number
Red seaweed	45
Green seaweed	25
Limpets	
Periwinkles	
Starfish	

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(ii) Complete and label the bar chart to show the number of each animal. [3]



(b)

- Seaweeds are the producers in the food chain.
- Periwinkles and limpets eat seaweeds.
- Starfish eat limpets and periwinkles.

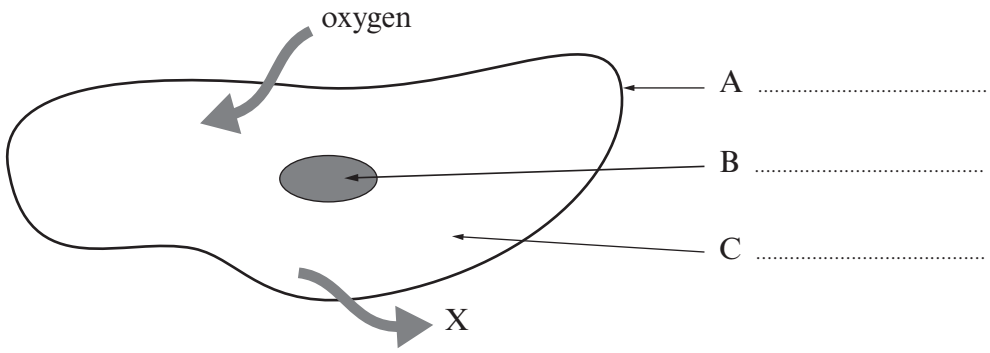
In the space below, draw a labelled pyramid of numbers for the organisms in the rock pool. [3]
Use three levels: producers, herbivores, carnivores.

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3. *Amoeba* is a one-celled animal that lives in ponds.



(a) Label A, B and C on the diagram. [3]

The pond water contains oxygen that *Amoeba* needs.

(b) (i) What is the name of the process by which oxygen moves into the *Amoeba*? [1]

.....

(ii) Name the process that uses oxygen. [1]

.....

(iii) Name the gas that is represented by the letter **X** in the diagram. [1]

.....

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4. *(a)* The table shows parts of the digestive system.
Number the boxes from 1 to 5 to show the correct order of parts that food passes through. [3]

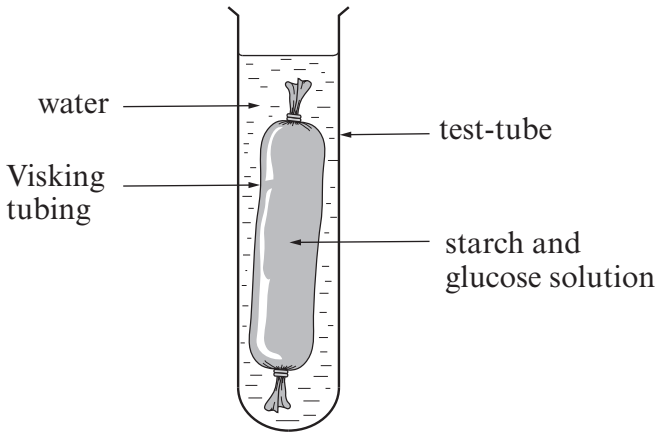
Part of digestive system	Order that food passes through
anus	
stomach	
mouth	
large intestine	
small intestine	

(b) In the table below, match each part of the digestive system to its correct function by writing the appropriate letters A - D from the list. [3]

A absorbs digested food
B joins the mouth with the stomach
C secretes proteases and acid
D secretes three types of digestive enzyme.

Part of digestive system	Function
oesophagus [gullet]	
stomach	
small intestine	
pancreas	

(c) Rhodri carried out an experiment, using the following apparatus, to show the absorption of food.



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Rhodri tested the contents of the Visking tubing and test-tube for starch and glucose at the start of his experiment.
He re-tested after 30 minutes.
His results are shown in the table.

Key: ✓ substance present
X substance absent

	Contents of Visking tubing		Contents of test-tube	
Time [mins]	starch	glucose	starch	glucose
0	✓	✓	X	X
30	✓	✓	X	✓

After 30 minutes, what did Rhodri find

(i) in the test-tube? [1]

.....

(ii) in the Visking tubing? [1]

.....

(iii) Explain his results. [2]

.....

.....

(iv) In this model of the intestine, what does the water in the test-tube represent? [1]

.....

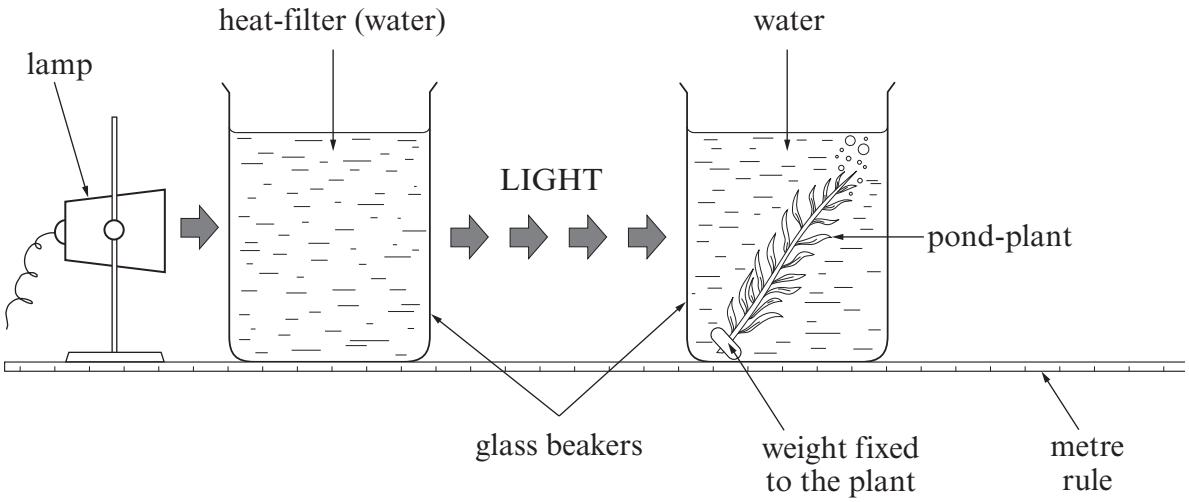
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5. *(a)* Name the chemical used by green plants to absorb sunlight energy during photosynthesis. [1]

.....

(b) The following apparatus was set up by students in a school laboratory.



Explain how you could use the apparatus to investigate the effect of different light intensities on the **rate** of photosynthesis of the pond plant. [3]

.....

.....

.....

.....

.....

.....

.....

.....

.....

(c) State **two** ways in which plant cells use the glucose produced in photosynthesis. [2]

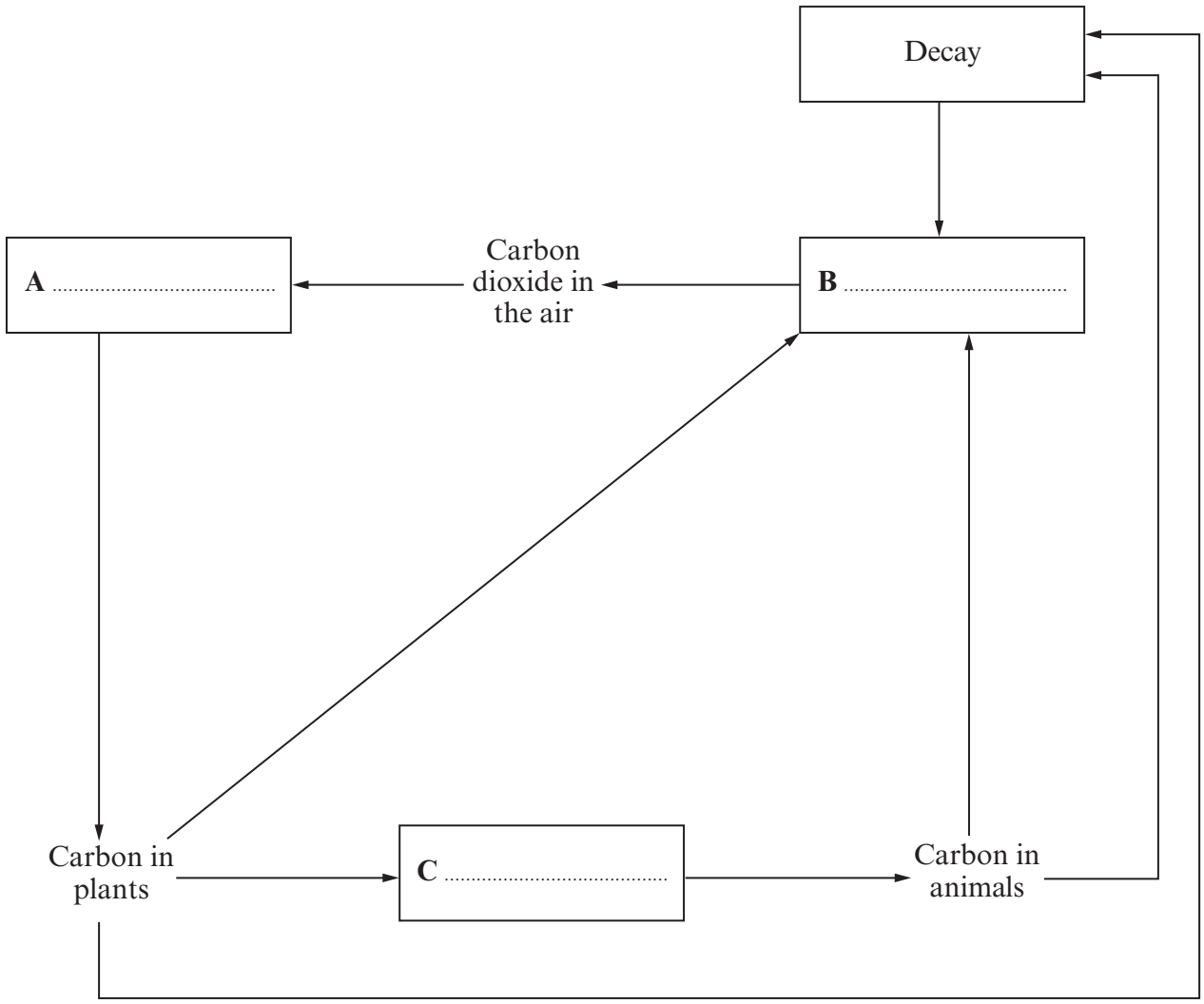
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6. The diagram shows the carbon cycle.



(a) Complete the diagram of the carbon cycle by naming the processes **A, B** and **C.** [3]

(b) Explain the part played by microbes in the carbon cycle. [2]

.....

.....

.....

.....

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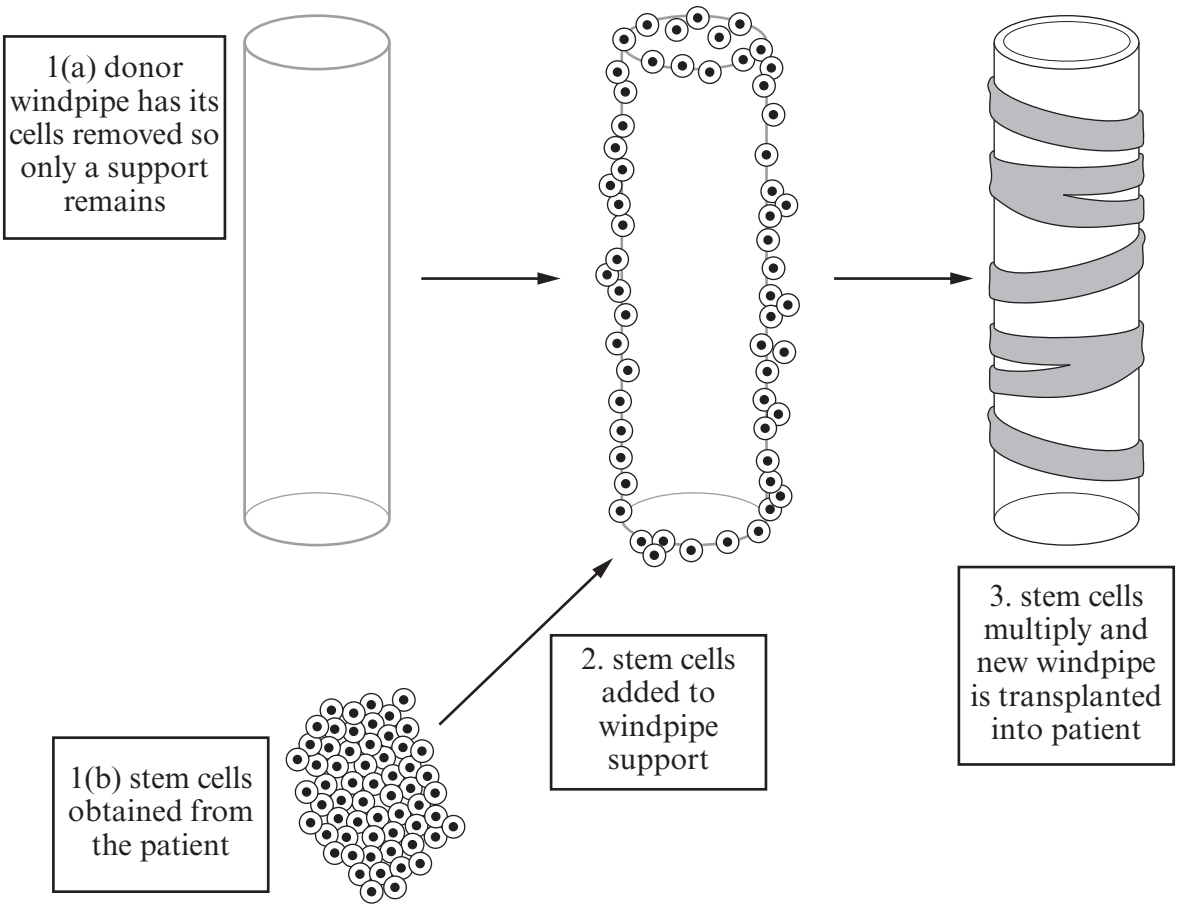
7. *(a)* What are stem cells? [2]

.....

.....

(b) In 2008 scientists carried out the first successful windpipe transplant in humans using the patient's own stem cells.

The process involved the following stages:



State **two** advantages to the patient of using their own stems cells rather than using embryonic stem cells. [2]

(i) .....

.....

(ii) .....

.....

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