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# General Certificate of Secondary Education 2022

## **Biology**

Unit 1

**Foundation Tier** 



[GBL11]

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**TUESDAY 17 MAY, MORNING** 

#### TIME

1 hour 15 minutes.

#### **INSTRUCTIONS TO CANDIDATES**

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

You must answer the questions in the spaces provided.

Do not write outside the boxed area on each page or on blank pages.

Complete in black ink only. Do not write with a gel pen.

Answer all eleven questions.

#### **INFORMATION FOR CANDIDATES**

The total mark for this paper is **75**.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

Quality of written communication will be assessed in Question 7(b).





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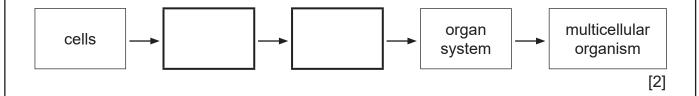
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1 Humans are multicellular organisms.

Multicellular organisms are made up of many cells.

(a) Complete the diagram which shows how cells are organised in a multicellular organism.



- (b) Name two organ systems found in humans.
  - 1. \_\_\_\_\_
  - 2. \_\_\_\_\_

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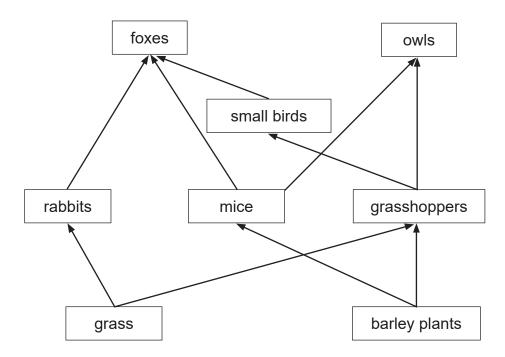
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2 The diagram shows a food web.



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Look at the diagram.

(a) Complete the food chain from this food web.

barley plants				foxes
		-		[2]

(b) Name an animal which feeds at **two** different trophic levels in this food web.

['	1]



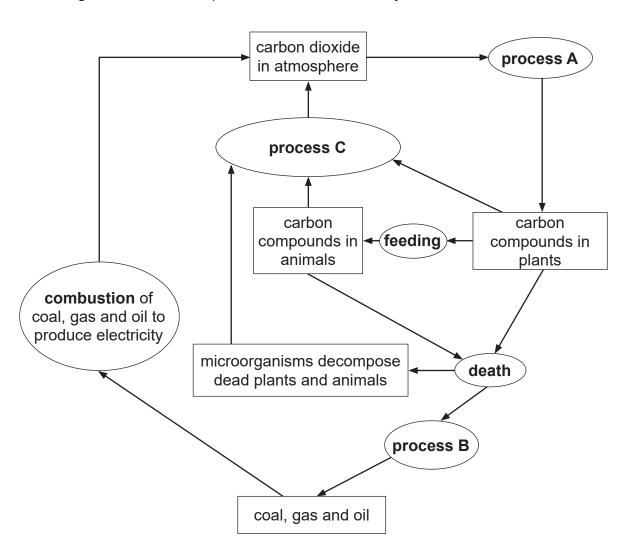
(c)	Suggest why the number of mice may decrease if a disease killed the rabbits.
	[2]
(d)	Give the source of energy for a food web.
	[1]

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**3** The diagram shows some processes in the carbon cycle.



Look at the diagram.

(a) Name processes A, B and C.

Α\_\_\_\_\_

В

C \_\_\_\_\_

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Wind turbines have large blades which move when wind hits them.

The movement of the blades produces electricity.

The photograph shows five wind turbines which are part of a wind farm.



© Getty Images

**(b)** Describe and explain how the use of wind farms affects the level of carbon dioxide in the atmosphere.

Use the diagram of the carbon cycle to help you.

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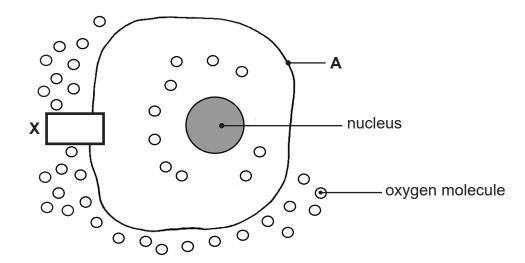
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4 The diagram shows oxygen molecules inside and outside an animal cell.



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Look at the diagram.

(a) Name part A.

\_\_\_\_\_[1]

Oxygen molecules move by diffusion.

- **(b) Draw an arrow in box X** to show the direction the oxygen molecules will move by diffusion. [1]
- (c) Explain why the oxygen molecules diffuse in this direction.

\_\_\_\_\_[1]

(d) Give two ways the rate of diffusion of molecules can be increased.

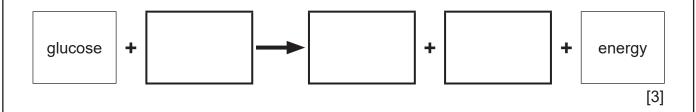
1. \_\_\_\_\_

2. \_\_\_\_\_[2]



5	(a)	Human	cells	obtain	eneray	from	respiration.
9	(a)	Tullian	Cella	Obtain	chergy	11 0111	respiration.

(i) Complete the word equation for aerobic respiration.



(ii) Suggest **two** ways human cells use the energy released during aerobic respiration.

1.

2.

During strenuous exercise human muscle cells can respire anaerobically.

**(b)** Give **two** ways anaerobic respiration differs from aerobic respiration in human muscle cells.

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2. \_\_\_\_\_

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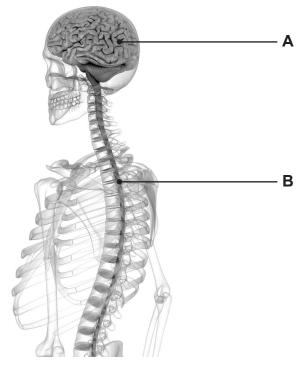
6	(a) (i)	Give <b>one similarity</b> between the nervous system and the hormonal system.
		[1]

(ii) Complete the table to show the **differences** between the nervous system and the hormonal system.

System	Type of signal	Speed of response
Nervous		
Hormonal	chemical	

[2]

**(b)** The diagram shows the central nervous system.



© Getty Images



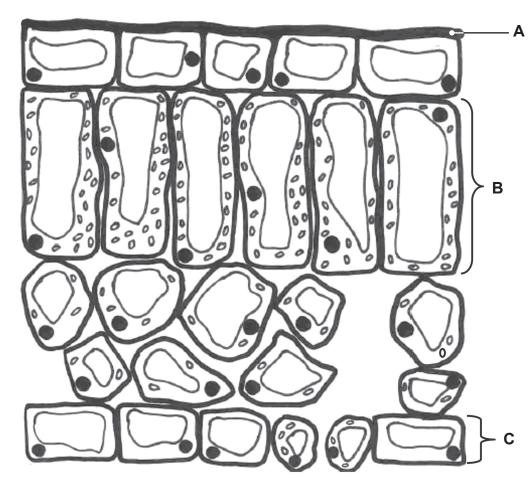
Look at the diagram.	
(i) Name parts <b>A</b> and <b>B</b> .	
Α	
В	[2]
The central nervous system coordinates stim	nuli and responses.
When a person smells food cooking, the saliva and the person feels hungry.	vary glands in their mouth produce
In this example, the stimulus is the smell of the	he food cooking.
(ii) Name the effector in this example.	
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7 (a) The diagram shows a cross section through a leaf.



Source: Principal Examiner

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Look at the diagram.

(i)	Name	layers	В	and	C.
-----	------	--------	---	-----	----

В

C

(ii) Give the function of layer A.

\_\_\_\_\_[1]



(b)	Describe and explain <b>three</b> ways leaves are adapted for photosynthesis.
	In this question, you will be assessed on your written communication skills and your use of specialist scientific terms.
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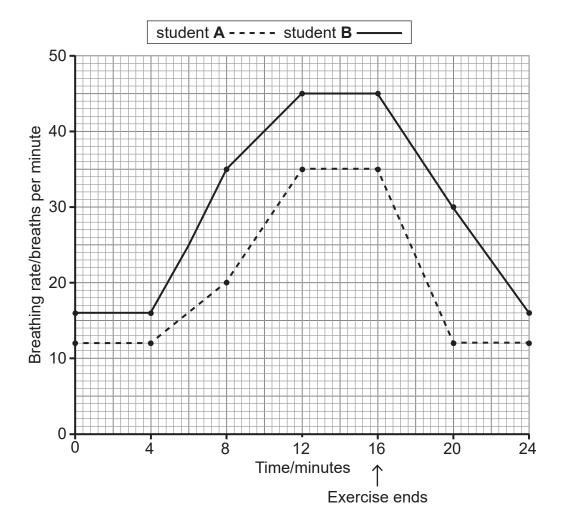


**8** A scientist investigated the effect of exercise on the breathing rate of two students.

The students did the same type of exercise for the same length of time.

The scientist measured the breathing rate of each student every four minutes before, during and after exercise.

The graph shows the results.





Look	< at	the graph.	
(a)	Sug	gest at what time the exercise starts.	
	Exp	lain your answer.	
-	Tim	e minutes	[1]
	Exp	lanation	
-			[1]
(b)	The	scientist compared the resting breathing rates of the two students.	
;	She	concluded that student <b>A</b> was fitter than student <b>B</b> .	
(	(i)	Give the resting breathing rates of the two students.	
		Student A breaths per minute.	
		Student <b>B</b> breaths per minute.	[2]
(	(ii)	Describe <b>two other</b> ways the results suggest that student <b>A</b> is fitter than student <b>B</b> .	
		Give data from the graph to support your answer.	
		1	
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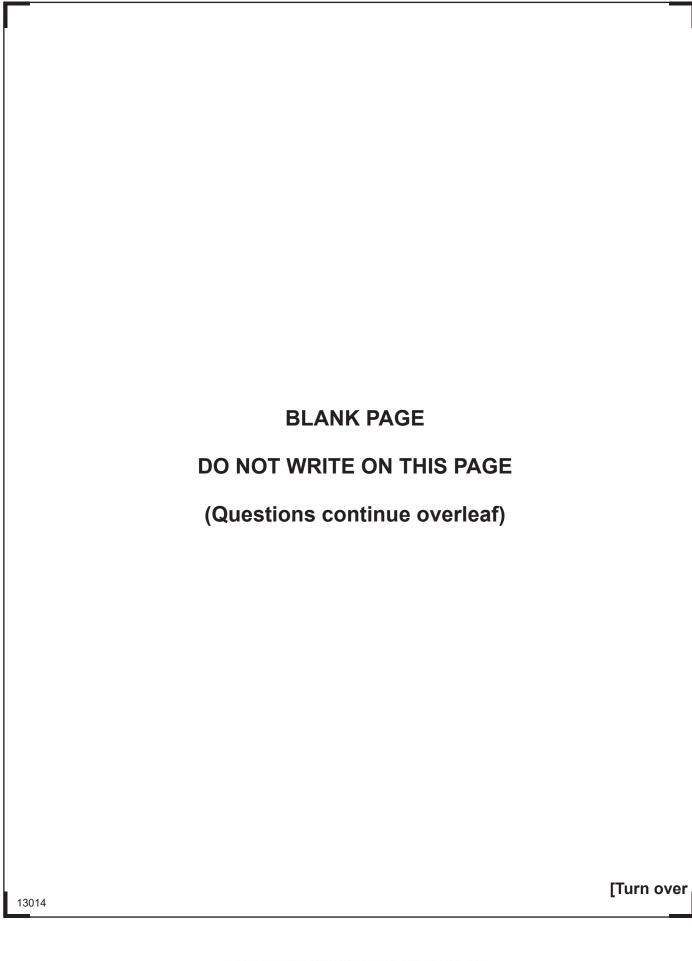
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plant species.	paratus the students	s used to estima	te the percentag	ge cover of the
				[1]
<b>le 1</b> shows the	students' results.			
		Table 1		
	Plant enocios	Percenta	ge cover	
	Plant species	Area A	Area B	
	grass	65	63	
	moss	9	26	
	daisies	7	2	
	buttercups	7	4	
	plantain	12	5	
	ole 1 shows the	moss daisies buttercups	Table 1           Percenta           Area A         Area A           grass         65           moss         9           daisies         7           buttercups         7	Table 1           Percentage cover           Area A         Area B           grass         65         63           moss         9         26           daisies         7         2           buttercups         7         4

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b)	Give <b>one</b> piece of evidence from <b>Table 1</b> to explain how they reached this conclusion.					
		[1]				



The students also measured three abiotic factors in the two different areas of the school grounds.

Table 2 shows the students' results.

Table 2

	Abiotic factor				
Area	light intensity /%	soil pH	soil temperature /°C		
Α	84	6.0	17		
В	60	6.0	13		

Look at **Table 1** and **Table 2**.

(c)	Suggest which plant species is best adapted to low light intensity compared to high light intensity.					
	Use evidence from both tables to support your answer.					
		_ [2]				
(d)	Suggest <b>one</b> other abiotic factor which would differ in the two areas.					
		_ [1]				

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10	(a)	Farmers	annly	fertiliser to	soil used	to	arow	crons
10	(a)	i aiiiicis	apply		Soli useu	ιO	grow	Grops.

Fertiliser adds minerals to the soil which increase crop yield.

Minerals in the soil are used by plants.

(i) Name the cells in a plant which take up minerals from the soil.

\_\_\_\_\_

[1]

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(ii) Name the process used by these cells to take up minerals from the soil.

\_\_\_\_\_

[1]

(iii) Give one way these cells are adapted to take up minerals from the soil.

[1]

**(b)** A scientist carried out an investigation to find the best mass of fertiliser to apply to a crop.

He sowed the same number of oat seeds in each of six equal-sized plots.

Plot 1 had no fertiliser applied.

Plots 2 to 6 had different masses of the same fertiliser applied.

He recorded the yield of the oat crop in each plot after 6 months.

The table shows his results.

Plot	Mass of fertiliser applied/kg	Yield of oat crop/kg
1	0	50
2	20	120
3	40	150
4	60	170
5	80	180
6	100	180



Loc	ok at the table.	
(i)	Calculate the percentage change in yield of oat crop when the mass of fertiliser applied was increased from 20 to 80 kg.	
	Show your working.	
	%	[3]
(ii)	Describe the trend shown in the scientist's results.	
		_ [2]
(iii)	The oat crop was able to grow in plot 1 even though no fertiliser was appl	- • •
(iii)	The oat crop was able to grow in plot 1 even though no fertiliser was appl Suggest why.	_ [2] ied.
(iii)		
(iii)		- • •
		ied.
	Suggest why.	ied.
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	Suggest why.  Fertilisers are expensive.	ied.
	Suggest why.  Fertilisers are expensive.	ied.

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11	(a)	Dea	ad leaves are decomposed by fungi.	
		(i)	What term is used to describe decomposers such as fungi?	
				[1]
		(ii)	Describe how fungi feed on dead leaves.	
				[3]
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(b)	A student investigated two conditions needed for the decomposition of
	dead leaves.

She weighed the leaves and then left them in different conditions for 28 days.

She reweighed the leaves and calculated the percentage mass **remaining**.

The table shows her results.

Temperature/°C	Water available for decomposers	Percentage mass of leaves remaining		
10	low	82		
10	high	62		
30	low	76		
30	high	38		
60	low	86		
60	high	86		

(i) Use evidence from the table to give the best conditions for the decomposition of dead leaves.Explain your choice.

	[2]
Suggest an explanation for the results at 60°C.	
	[1]

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(ii)

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## THIS IS THE END OF THE QUESTION PAPER

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For Examiner's use only	
Question Number	Marks
1	
2	
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Total Marks

**Examiner Number** 

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