

Centre Number				
71				

Cano	didate	Num	ber

General Certificate of Secondary Education 2012–2013

Double Award Science: Biology

Unit B1

Foundation Tier

[GSD11]

TUESDAY 14 MAY 2013, MORNING



TIME

1 hour.

INSTRUCTIONS TO CANDIDATES

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

Write your answers in the spaces provided in this question paper. Answer **all seven** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 70.

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 6(a)(i).

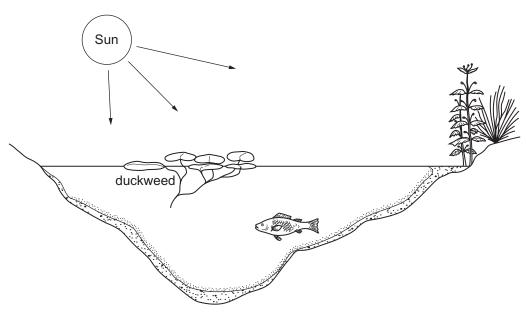
For Examiner's use only				
Question Number	Marks			
1				
2				
3				
4				
5				
6				
7				



1 The diagram shows a pond and surrounding area.

Duckweed is a type of plant.





Source: Principal Examiner

(a) What is the energy source for the living organisms in the pond?

______ [1]

(b) Name the process carried out by the duckweed and fish that produces carbon dioxide.

______[1]

(c) Name the process carried out by the duckweed that produces oxygen.

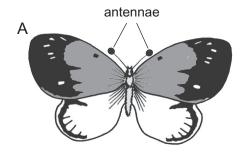
______[1]

(d)	(i)	ing	Examin Marks	er Only Remark	
	(::\		[1]		
	(11)	These organisms return minerals to the soil. One mineral is nitrate.			
		What do plants use nitrates for?	[1]		
	(iii)	Name the cells in plants that take up minerals from the soil.			
			[1]		
(e)	(i)	What apparatus would pupils use to sample organisms from a pond?			
			[1]		
	(ii)	Give one abiotic factor that may influence the numbers and typ of animals living in a pond.	es		
			[1]		

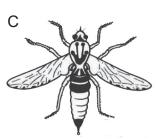
The diagram shows four insects pupils found during their study of the area around the pond.

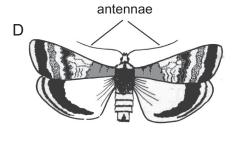
Examiner Only

Marks Remark



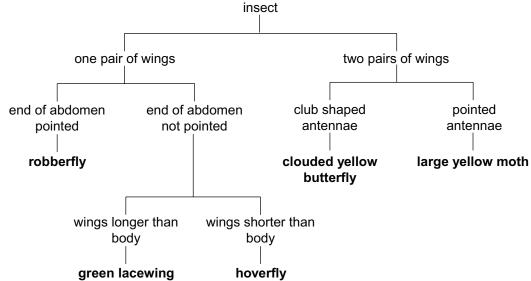






© Diagram of four insects sourced from Basic Biology Questions for GCSE by C & B Rouan, published by Stanley Thornes, 1994. ISBN 0859505510

KEY



(f) Use the key to identify each of the insects shown in the diagram.

В ______

D _____

[2]

2	The table shows the energy content for food eaten by a man for his
	breakfast

Examiner Only				
Marks	Remark			

Food type	Energy content/kJ
Milk	280
Cereal	1500
Coffee with sugar	1680
Bacon	2090
Toast with butter	1050

1	_		/:\	Calculate the	man'a tatal	anaray intaka	from this	brookfoot
l	a) ((1)	Calculate the	man's total	eneray intake	IIOIII IIIIS	Dreakiasi

 kJ	[1	1
		4

(ii) The recommended energy intake for an average man is 10 450 kJ per day. The man's lunch and dinner each has a similar energy content to his breakfast.

Give **one** long term consequence if he continues with this diet.

=xp	lain	your	answer.	

			[2]

- **(b)** Milk contains carbohydrates, fats and proteins.
 - (i) Name the test used to show the presence of protein in milk.

Give the colour of a positive result.

Test				

Colour _____ [2

(ii) Name **one** other substance in milk that contributes to a balanced diet.

[1]

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(a)	Wh	en plant leaves carry out photosynthesis they produce starch.	Examiner C
		list gives the stages (A–E) in carrying out a starch test on a lean nvestigation on photosynthesis, but they are not in the correct er.	
	Α	Add iodine solution to a leaf.	
	В	Dip the leaf in hot water to soften it.	
	С	Place the leaf in boiling water for 1–2 minutes.	
	D	Place the leaf in boiling alcohol for several minutes.	
	E	Put the plant in light for 12 hours and then remove a leaf.	
	(i)	Place the letters in the correct order to carry out a starch test.	
		Stages E and A have been done for you.	
		E A	[2]
	(ii)	What is the purpose of step D ?	
			. [1]
	(iii)	What colour will the iodine solution turn when it is added to the leaf if the leaf contains starch?	
			[1]
(b)		y is it necessary to destarch the plant before carrying out this estigation?	

(c) A market gardener wanted to increase his yield of lettuces by increasing the concentration of carbon dioxide in his glasshouse.

Examiner Only

Marks Remark

However, he had read that high concentrations of carbon dioxide may harm humans. He researched this and found the two tables below which gave him the information he required.

The table below shows how different concentrations of carbon dioxide affect the yield of lettuces in a glasshouse at 35 °C.

Carbon dioxide concentration in glasshouse/ppm	Yield of lettuces/%
700	100
950	100 + extra 25
1250	100 + extra 35

The table below shows how different concentrations of carbon dioxide could affect the health of humans.

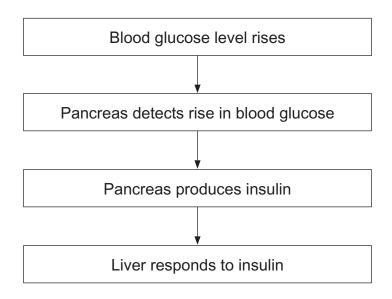
Carbon dioxide concentration in glasshouse/ppm	Effect on health of humans
700–999	None
1000–1250	Possible dizziness and appearance of symptoms for people with asthma or respiratory conditions

(i)	Using the information in both tables, give the most suitable
	concentration of carbon dioxide to grow lettuces in the glasshouse.
	Explain your choice.

Concentration	_ ppm	
Explanation		
		[3

(ii)	Suggest one environmental factor, other than carbon dioxide, that helps the growth of lettuces in a glasshouse. [1]	Examin Marks	er Only Remark
(iii)	Give one economic factor the market gardener should consider when growing his lettuces in a glasshouse.		
	[1]		

4 (a) The diagram shows some of the stages involved in the control of blood glucose levels.



(i) How does insulin travel from the pancreas to the liver?

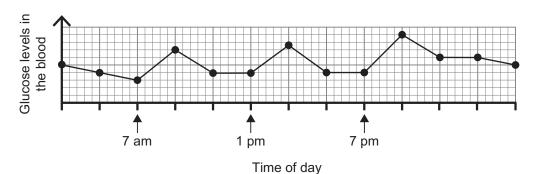
_____[1]

(ii) How does insulin affect blood glucose levels?

[1]

(iii) Describe two ways in which the liver responds to insulin.

______[2]



Source: Principal Examiner

(i)	Using the graph and your knowledge, suggest why there are
	peaks in blood glucose levels during the day.

______[1]

(ii) People with Type 1 diabetes may need to inject themselves with insulin several times a day.

Using the graph and your knowledge, suggest why they need to inject themselves with insulin several times a day.

______[1]

(c) One symptom of diabetes is the presence of glucose in the urine.

The table gives results of glucose tests carried out on urine samples from two people.

Name	Initial colour	Final colour
John	Blue	Brick red
Anne	Blue	Blue

(i)	Explain	how these	results	suggest	that	John	has	diabetes.
` '				00				

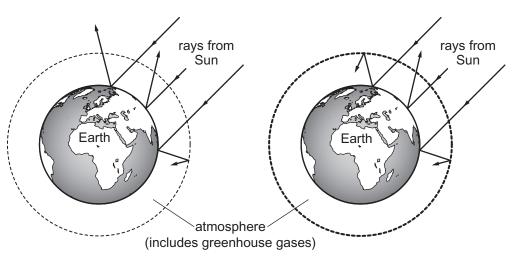
_____[1]

(ii) Give two other symptoms of diabetes.

1. _____

2. ______[2]

5 The diagram represents what happened to rays of sunlight when they entered the Earth's atmosphere thirty years ago and five years ago.



thirty years ago

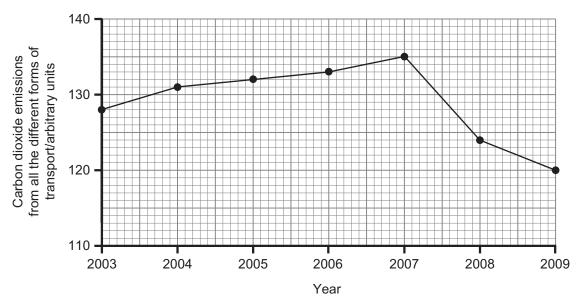
five years ago

Source: Principal Examiner

[1]

(a)	(i)	Use the diagram, and your knowledge, to explain how global warming occurs.	
			[2
	(ii)	Give one environmental consequence of global warming.	

The graph shows carbon dioxide emissions from all the different forms of transport in the UK during the period 2003–2009.



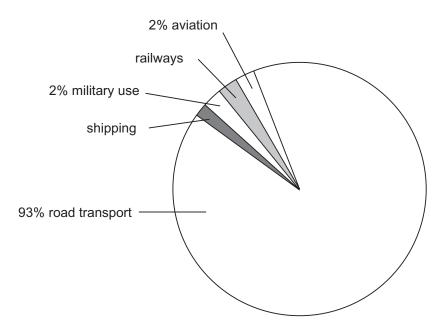
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[2]

(b) Describe the trend in carbon dioxide emissions from transport between 2003–2009.

Use evidence from the graph to support your answer.

The pie chart shows the percentage of carbon dioxide emissions from each of the different forms of transport in the UK in 2009.



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(c) Railways produce twice the amount of carbon dioxide emissions than shipping does.

Use this information and the pie chart to calculate the percentage of carbon dioxide emissions produced by the railways.

Show your working.

_____ % [3]

(d) (i) Suggest **one** way of reducing the carbon dioxide levels produced by road transport.

______[1]

(ii) Give **one** other source of carbon dioxide emissions apart from those produced by transport.

______ [1]

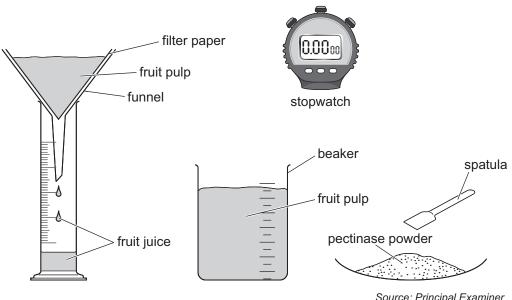
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(Questions continue overleaf)

(a) Fruit juice is normally obtained from fruit pulp. Fruit pulp is obtained by 6 squeezing the fruit. The pulp is then treated by adding the enzyme pectinase, which breaks down pectin in the walls of fruit cells. This allows the fruit juice to be released more quickly from the cells.

Examiner Only			
Marks	Remark		

The diagram shows some of the apparatus you may need.



Source: Principal Examiner

(i) Describe how you would carry out an investigation to compare how quickly fruit juice is released from fruit pulp with and without pectinase.

In this question you will be assessed on your written

communication skills, including the use of specialist scientific terms.				

	(ii)	Give one other factor that could be investigated to see if it wou cause the release of more fruit juice from the fruit pulp.	Examiner On Marks Ren
			[1]
	(iii)	Pectinase is used commercially by fruit juice manufacturers. Give one other commercial use of enzymes.	
			[1]
(b)	(i)	Enzymes speed up digestion in the body. Complete the diagram with the name of the appropriate enzyme and draw the produce produced when this protein molecule is broken down in the digestive system.	
	Prote olec	Name of enzyme Products	
	\bigcirc		[3]
	(ii)	Where in the digestive system does digestion of proteins take place?	
		and	[2]
	(iii)	Where in the digestive system does absorption of digested footake place?	d
			[1]
	(iv)	State one way that the digestive system is adapted for absorpt	ion.
			[1]

7	(a)	Using the informa	tion below, complete the f	ood web.	Examiner Only Marks Remark
		• Earthworms	are eaten by frogs and hav	vks.	Marks Remark
		Frogs are ear	ten by hawks.		
		 Insects are e 	aten by spiders which in tu	ırn are eaten by hawks.	
		 Insects eat pl 	lants.		
	,	• Earthworms	eat plants.		
			7		
				frogs	
		insects			
				[4]	

(b)	Using the information in part (a) opposite, draw a labelled pyramic numbers for the food chain that contains insects.	d of	Examin Marks	er Only Remark
	numbers for the food chain that contains insects.			
		[3]		
(c)	Give two ways in which insects lose energy.			
	1			
	2	[2]		
		[-]		
(d)	Give one advantage to the hawk of having several food sources.			
		_ [1]		
		ניז –		
_				
1	THIS IS THE END OF THE QUESTION PAPER			
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