



Rewarding Learning

General Certificate of Secondary Education
2014

Centre Number

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Candidate Number

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GCSE Biology

Unit 1

Higher Tier



[GBY12]

GBY12

FRIDAY 6 JUNE, AFTERNOON

TIME

1 hour 30 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 box, around each page or on blank pages.

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

Answer **all twelve** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is **100**.

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

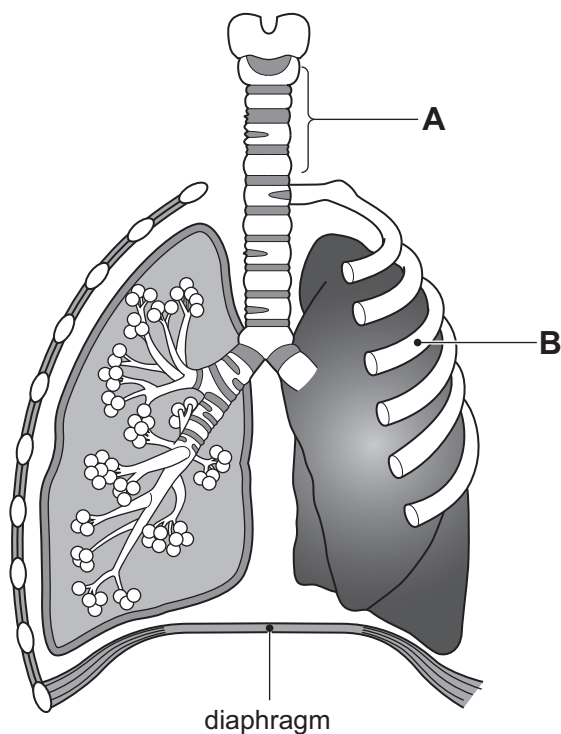
Quality of written communication will be assessed in questions **10** and **12(d)**.

8685.05



32GBY1201

1 The diagram shows part of the respiratory system.



© OCR Gateway GCSE Biology by S Broadley, S Hocking, M Matthews, published by Oxford University Press, ISBN 978 0199135684

Look at the diagram.

(a) Name parts **A** and **B**.

A _____ [1]

B _____ [1]

(b) The diaphragm changes when you breathe in and out.

Describe these changes.

Breathe in _____

Breathe out _____

_____ [2]

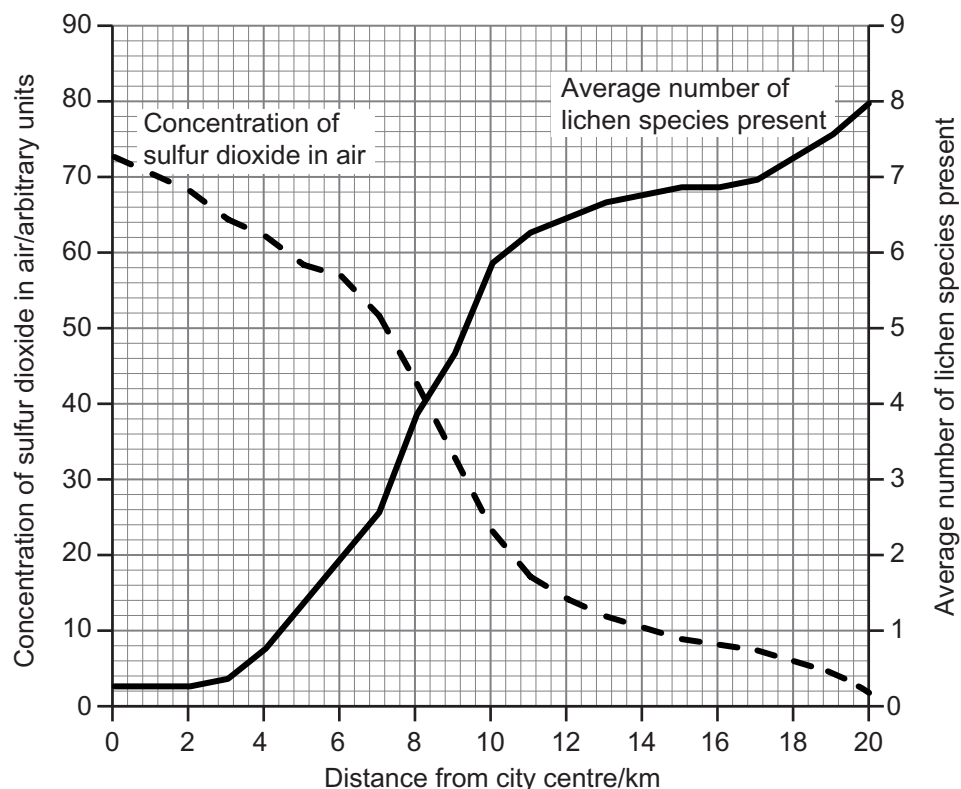
Examiner Only

Marks Remark

Total Question 1



- 3 The graph shows the concentration of sulfur dioxide in the air and the average number of lichen species present on trees at different distances from a city centre.



Source: Chief Examiner

Look at the graph.

- (a) The concentration of sulfur dioxide in the air changes as you move away from the city.

Describe the change.

[1]

Examiner Only	
Marks	Remark



(b) The graph shows that some species of lichens tolerate high concentrations of sulfur dioxide in the air.

Give data from the graph which supports this conclusion.

[2]

(c) Give **one** source of sulfur dioxide in air.

[1]

(d) Species such as lichens can be used to monitor pollution.

What term is used to describe species like these?

[1]

Examiner Only

Marks Remark

Total Question 3

[Turn over



- 4 The table shows the loss of vitamin C content of four types of salad leaves stored for 10 days after picking.

Type of salad leaf	Vitamin C content per 100 g of salad leaves/mg		Percentage loss of vitamin C
	Day 0	Day 10	
Green lettuce	0.10	0.09	
Wild rocket	72.97	3.55	95.10
Lamb's lettuce	59.18	13.61	77.00
Red lettuce	0.07	0.07	0.00

Look at the table.

- (a) Calculate the percentage loss of vitamin C content in green lettuce.

Show your working.

Write your answer in the table. [2]

- (b) Use data from the table to explain which type of salad leaf is most suitable for use after storing for 10 days.

[2]

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Marks	Remark



(c) A bag of fresh mixed salad leaves has a vitamin C content of 20 mg per 100 g.

A portion of fresh salad leaves weighs 60 g.

(i) Calculate the mass of vitamin C in a 60 g portion of fresh mixed salad leaves.

Show your working.

Mass _____ mg [1]

An adult is advised to have a daily intake of 50 mg of vitamin C.

(ii) What percentage of their daily vitamin C is provided by this portion of fresh mixed salad leaves?

Show your working.

Percentage _____ [1]

Examiner Only

Marks Remark

Total Question 4

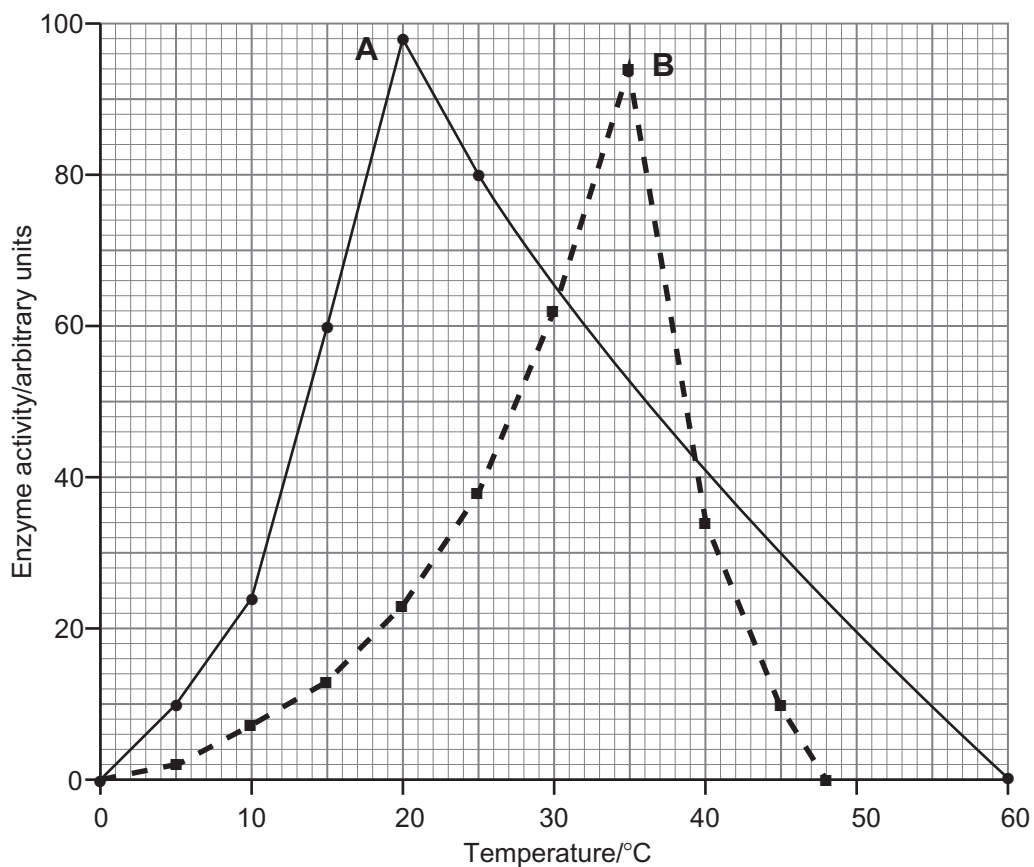
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32GBY1207

5 The graph shows the activity of two different enzymes, **A** and **B**, over a range of temperatures.



Source: Chief Examiner

(a) Describe **two** differences between the activity of the two enzymes **above 20°C**.

[2]

Examiner Only	
Marks	Remark





Enzyme **A** is found in biological washing powders.

- (b) Give the optimum temperature for enzyme **A** and explain why it is more economical to use in washing powders than enzyme **B**.

_____ [2]

Enzyme **B** digests food molecules in the duodenum.

- (c) Why is it necessary to digest food molecules?

_____ [2]

Enzymes are described as biological catalysts.

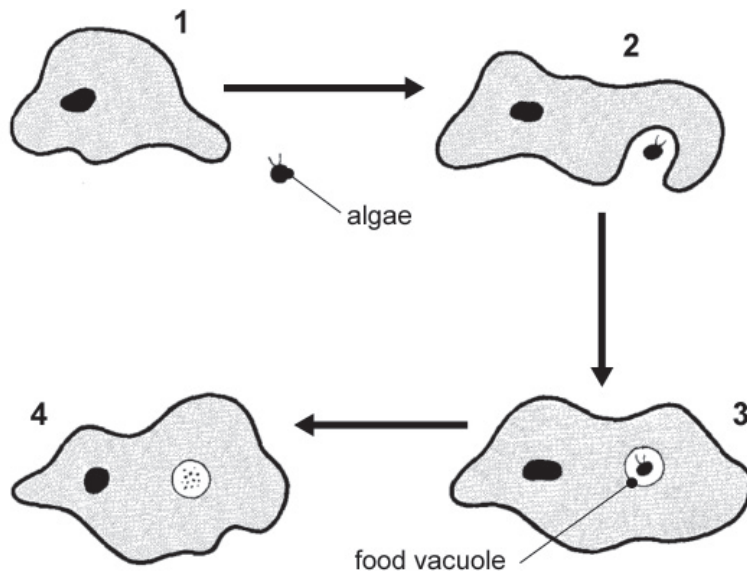
- (d) Explain what is meant by a catalyst.

_____ [1]

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Marks	Remark
Total Question 5	



The diagram shows how an amoeba feeds.



© "Living Things", by V Slaughter 1980. ISBN-10: 0-7131-0416-3 / ISBN-13: 9780713104165.
 Reproduced by permission of Hodder Education.

(b) Use the diagram to describe how an amoeba feeds.

[3]

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Marks	Remark

[Turn over



The photograph shows Euglena.

It is another single-celled organism.



flagellum for movement

chloroplast

cell membrane

© Biophoto Associates/ Science Photo Library

(c) Euglena is difficult to classify because it has both plant and animal features.

Use the photograph to give one plant and one animal feature.

plant _____

animal _____

[2]

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Marks	Remark
Total Question 6	





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[Turn over



32GBY1213

7 (a) Diabetes can be treated with injections of insulin into the bloodstream.

Describe what effects insulin has in the liver.

[3]

(b) The graph shows the changes in the blood glucose concentration of two people with diabetes, over a period of twenty-four hours.

One person has started treatment.



© The Association of the British Pharmaceutical Industry

Examiner Only	
Marks	Remark





(i) Give the value for normal blood glucose concentration.

[1]

(ii) Describe what happens to the blood glucose concentration after each meal.

[1]

(iii) Nicholas has not started treatment for his diabetes.

Give two pieces of evidence from the graph which show this.

_____ [2]

(iv) Give **two other** symptoms of diabetes.

1. _____ [1]

2. _____ [1]

(v) Give **two long-term effects** of untreated diabetes.

1. _____ [1]

2. _____ [1]

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Marks

Remark

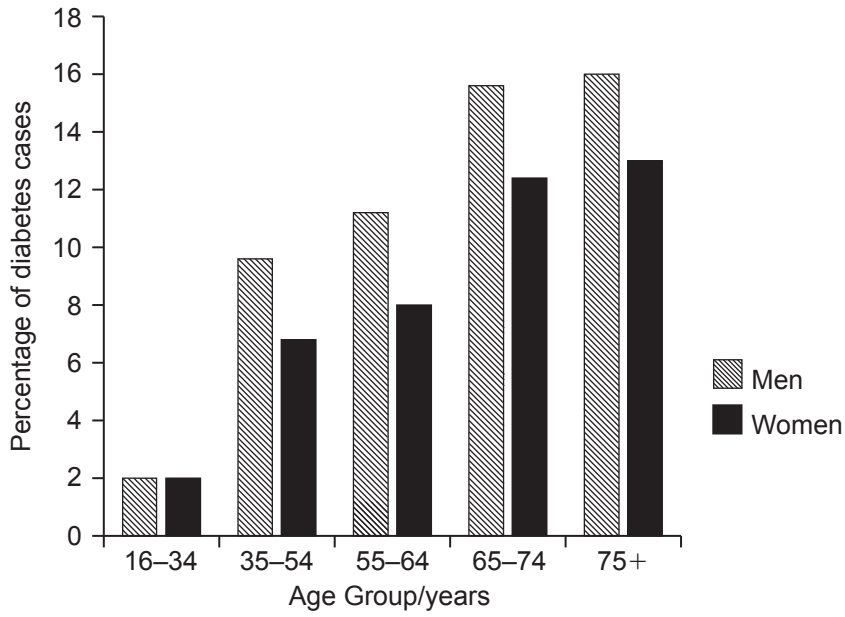
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32GBY1215

The bar chart shows the percentage of diabetes cases in the United Kingdom in 2010.



Source: www.diabetes.org.uk/ key statistics on diabetes

(c) Describe **three trends** shown in the bar chart.

1. _____

 _____ [1]

2. _____

 _____ [1]

3. _____

 _____ [1]

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Marks	Remark
Total Question 7	





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32GBY1217

- 8 The table shows measurements of three men, Ajay, Michael and Rory made during a health check.

Name	Height/m	Mass/kg
Ajay	1.55	63.6
Michael	1.75	81.8
Rory	1.60	81.8

The chart shows the Body Mass Index (BMI) values for men of different heights and masses.

Use the measurements of Ajay, Michael and Rory in the table and data from the chart to compare the BMI of the three men.

		Body mass index																	
		20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37
Height in metres		Weight in kilograms																	
		1.50	45	47	50	52	54	56	59	61	63	65	68	70	72	74	77	79	81
	1.55	48	51	53	55	58	60	63	65	67	70	72	75	77	79	82	84	87	89
	1.60	51	54	56	59	61	64	67	69	72	74	77	79	82	85	87	90	92	95
	1.65	54	57	60	63	65	68	71	74	76	79	82	84	87	90	93	95	98	101
	1.70	58	61	64	67	69	72	75	78	81	84	87	90	93	95	98	101	104	107
	1.75	61	64	67	70	74	77	80	83	86	89	92	95	98	101	104	107	110	113
	1.80	65	68	71	75	78	81	84	88	91	94	97	100	104	107	110	113	117	120
	1.85	69	72	75	79	82	86	89	92	96	99	103	106	110	113	116	120	123	127
	1.90	72	76	79	83	87	90	94	98	101	105	108	112	116	119	123	126	130	134
	1.95	76	80	84	88	91	95	99	103	107	110	114	118	122	126	129	133	137	141
		Healthy					Overweight					Obese							

© New Zealand Ministry of Health

- (a) Which man is obese? _____

Use evidence from the chart to support your answer.

_____ [2]

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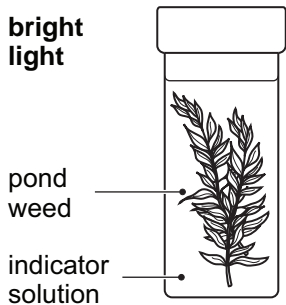




32GBY1223

11 A pupil set up an experiment using pond weed.

Each tube contained the same volume of indicator solution.

The tubes were left in different light conditions for 24 hours.

Light condition	Colour of indicator	
	at start	after 24 hours
bright light 	red	purple
dim light 	red	
dark 	red	yellow

© Illustrated Biology Questions (1986), ISBN 0435591010, Philip Booth and Geoffrey Hall, publisher: Pearson. Duplication is prohibited other than for teaching and study.

(a) Describe the contents of a control tube for this experiment.

[1]

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Marks	Remark



(b) It may not be valid to compare the results for each tube.

Suggest **one** reason why.

_____ [1]

(c) Give **two other** variables which must be controlled.

1. _____
2. _____ [2]

(d) Name the indicator solution used in this experiment.

_____ [1]

(e) Explain the colour change observed in the test tube placed in bright light.

_____ [3]

(f) The tube in dim light represents the compensation point.

(i) Give the colour of the indicator in the tube in dim light after 24 hours.

_____ [1]

(ii) What is meant by the compensation point?

_____ [2]

Examiner Only

Marks Remark

Total Question 11

[Turn over



12 Plants absorb nitrates from the soil through their roots.

(a) Explain why plants need nitrates.

[2]

(b) Name the process roots use to absorb nitrates.

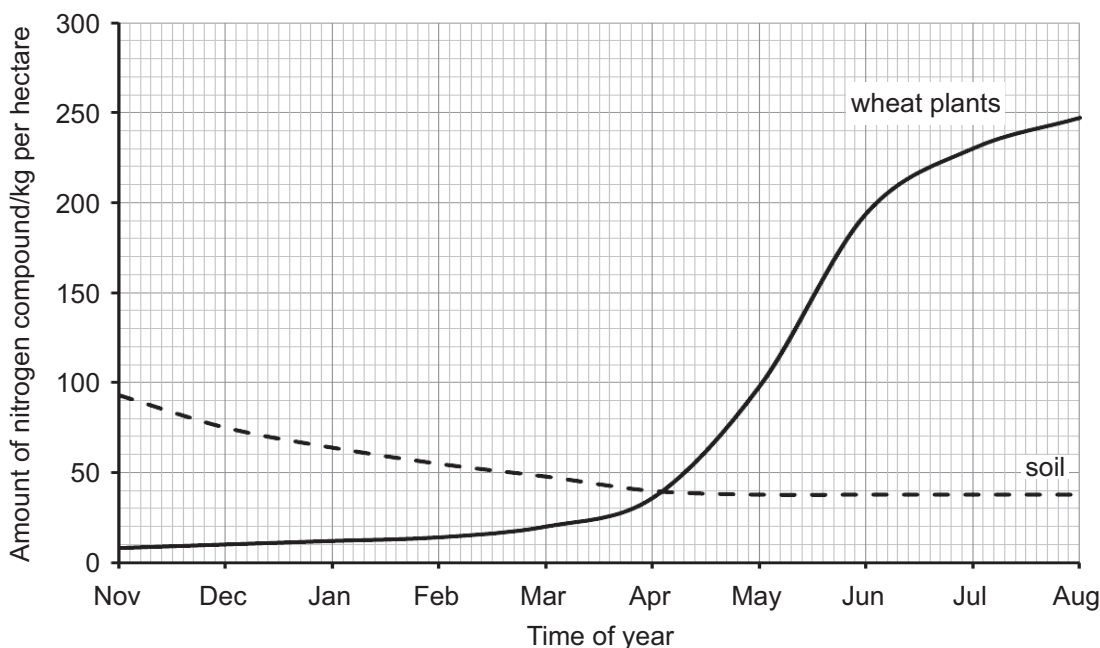
[1]

In the winter months, the temperature is low and the soil is often waterlogged.

In the summer, the temperature increases and the soil dries out.

These environmental conditions affect the bacteria of the nitrogen cycle that are active in the soil.

The graph shows changes in the amount of nitrogen compounds in wheat plants and the soil between November and August.



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(c) The graph shows that between November and January nitrogen compounds in the soil drop from 95 to 65 kg per hectare.

The difference may be due to denitrification.

(i) Explain how this process could cause a fall in the amount of nitrogen compounds in the soil.

[4]

(ii) Leaching may also cause a fall in the amount of nitrogen compounds in the soil during these months.

Explain how.

[2]

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Question Number	Marks
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12	

Total Marks	
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