



Rewarding Learning

General Certificate of Secondary Education
2017–2018

Centre Number

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Candidate Number

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Science: Single Award

Unit 1 (Biology)
Higher Tier



[GSS12]

WEDNESDAY 7 NOVEMBER 2018, MORNING

TIME

1 hour 15 minutes.

INSTRUCTIONS TO CANDIDATES

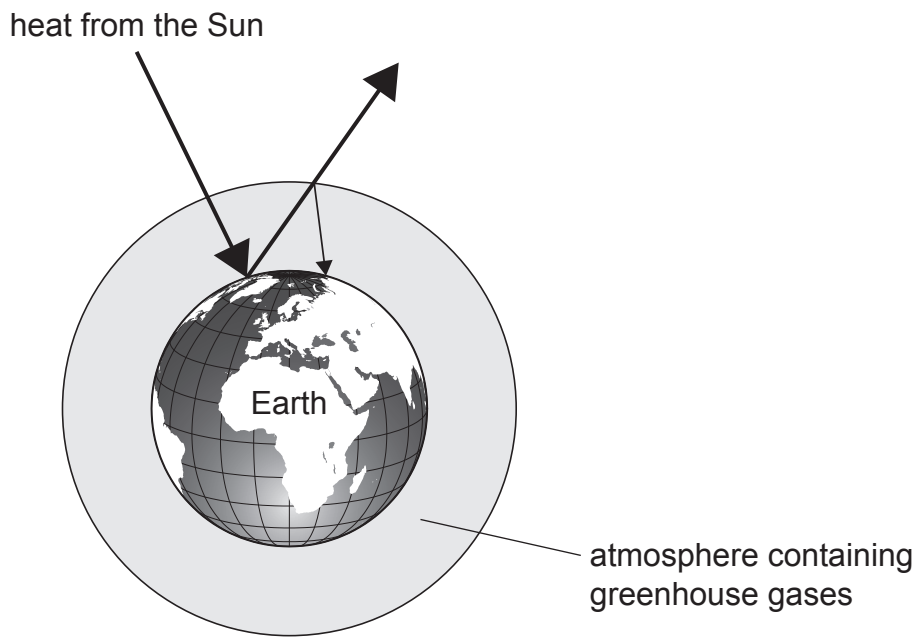
Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
Write your answers in the spaces provided in this question paper.
Answer **all ten** questions.

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 Questions **4(c)** and **10**.

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
Total Marks	

- 1 The diagram below shows what happens to heat from the Sun when it reaches the Earth.



Source: CCEA

- (a) Using the diagram above and your knowledge explain how global warming occurs.

[3]

- (b) Over the past 100 years global warming has increased. State **two** ways human activity has contributed to this increase.

1. _____

2. _____ [2]

Examiner Only	
Marks	Remark

- (c) (i) Global warming can be monitored using abiotic factors.
What is meant by the term **abiotic**?

_____ [1]

- (ii) Explain how monitoring polar ice fields can tell scientists that global warming is increasing.

_____ [1]

Examiner Only

Marks Remark

2 The flowers on a pea plant can be purple or white.



© Bob Gibbons / Science Photo Library

The allele for white flowers is recessive to the allele for purple flowers.

(a) What is meant by the term **recessive**?

[1]

Examiner Only	
Marks	Remark

(b) (i) Complete the Punnett square below to show the offspring from two heterozygous purple flowers.

Use the symbols: A = purple allele
a = white allele

		a
A		

[2]

(ii) What is the genotype for a **white** flower?

[1]

(iii) What is the probability of the offspring having **purple** flowers?

[1]

Examiner Only	
Marks	Remark

- 3 (a) The red fox was introduced to Australia by European settlers in 1855. Since it was introduced, the red fox has been linked to many of the extinctions of native Australian mammals.



© JMQuinet / Reporters / Science Photo Library

- (i) Give **one** reason why the red fox is described as a competitive invasive species in Australia.

_____ [1]

- (ii) Explain what is meant by the term **extinction** of a species.

_____ [1]

Examiner Only	
Marks	Remark

(b) Many conservation programmes are aimed at reducing the number of red foxes. These include fencing areas of farmland, using a poison that does not harm native animals and encouraging dingos. Dingos are a native Australian dog that hunt foxes and other small mammals.

(i) Explain the advantage to the **native species** of Australia of using poison as a method of conservation.

[1]

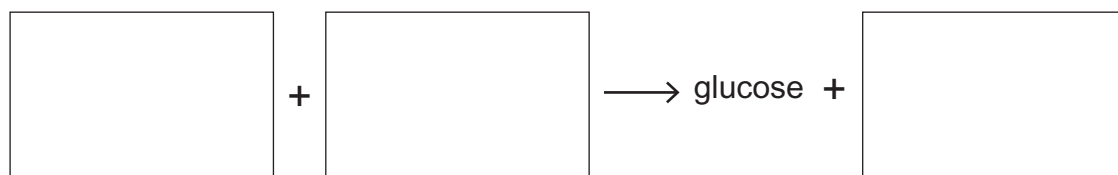
(ii) Use the information given to explain fully why many farmers would prefer to use fences rather than introduce dingos to areas around their farms.

[2]

Examiner Only	
Marks	Remark

4 Photosynthesis is the process in which green plants use sunlight to produce glucose.

(a) Complete the word equation for photosynthesis:



[3]

(b) Give **one** reason why photosynthesis in plants is vital for animals.

 _____ [1]

(c) The glucose produced during photosynthesis is stored as starch in the leaves of the plant.

Describe how you would test a leaf for the presence of starch.

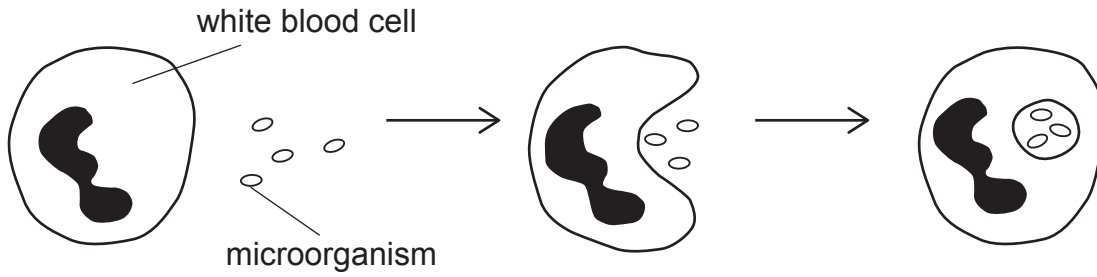
Your answer should include:

- the names of any chemicals used
- the result you would expect

In this question you will be assessed on your written communication skills including the use of specialist scientific terms.

Examiner Only	
Marks	Remark

5 (a) The diagram below shows the process of phagocytosis.



Source: CCEA

(i) Name the type of white blood cell which carries out phagocytosis.

_____ [1]

(ii) Using the diagram and your knowledge describe the process of phagocytosis.

 _____ [2]

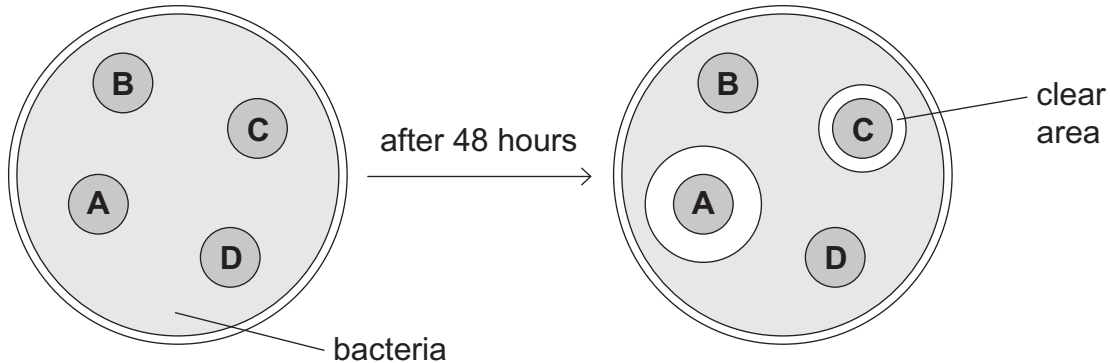
(b) Explain fully the difference between active and passive immunity.

 _____ [2]

Examiner Only	
Marks	Remark

(c) To investigate the effect of different antibiotics on bacteria three discs (**A**, **B** and **C**) were soaked in different antibiotics. A fourth disc (**D**) was soaked in water. The discs were placed in a Petri dish that contained bacteria and then left for 48 hours.

The results are shown below.



Source: CCEA

(i) Why is it important to wash your hands **before** carrying out this investigation?

_____ [1]

(ii) Which disc, **A**, **B** or **C** contained the most effective antibiotic? Explain your answer.

 _____ [2]

(iii) Why was it important to include disc **D** in the investigation?

_____ [1]

(d) MRSA is a bacterial infection which is resistant to antibiotics and is causing many hospital patients to become very ill.

(i) Suggest **one** reason why hospital patients are particularly at risk from MRSA.

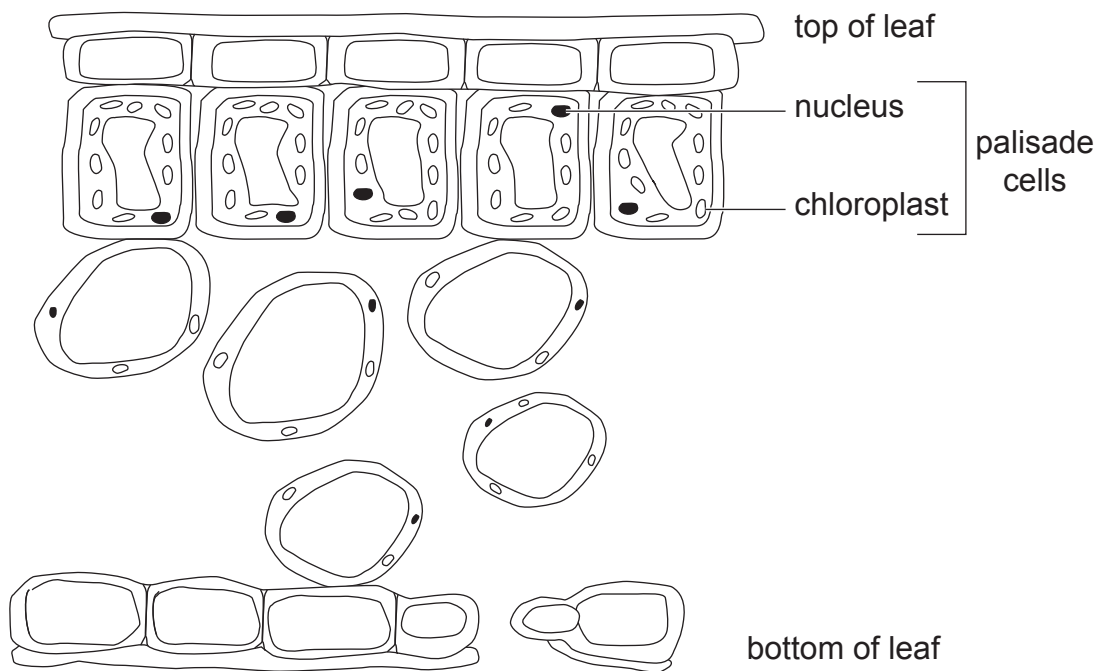
 _____ [1]

(ii) Suggest why the number of patients becoming infected with MRSA in hospitals has decreased in recent years.

 _____ [1]

Examiner Only	
Marks	Remark

6 The diagram below shows a cross-section from a leaf.



Source: CCEA

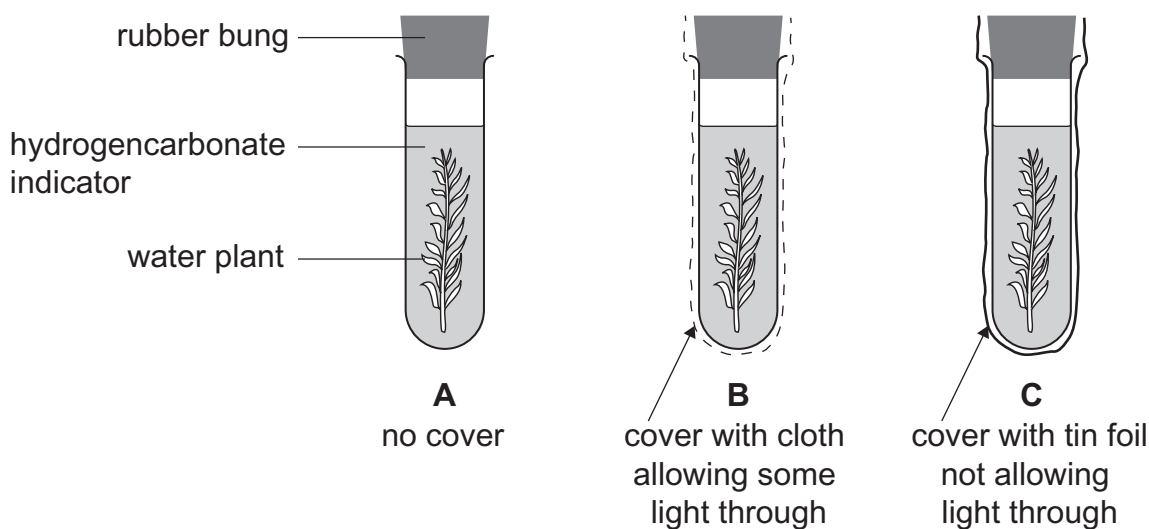
(a) Using only the information shown in the diagram give **two** ways in which palisade cells are adapted to maximise photosynthesis.

1. _____

2. _____
 _____ [2]

Examiner Only	
Marks	Remark

- (b) Respiration is another process that occurs in plants. Sinéad wanted to investigate the relationship between photosynthesis and respiration in plants. She set up the investigation shown below.



Source: CCEA

The investigation was left in bright light for 6 hours.

The hydrogencarbonate indicator changes colour as the level of carbon dioxide changes. The colour changes are shown in the table below.

Colour of hydrogencarbonate indicator	Level of carbon dioxide
purple	low
red	normal (atmospheric)
yellow	high

- (i) Explain fully why the hydrogencarbonate indicator will remain **red** in test tube **B** after 6 hours.

[2]

- (ii) What colour will the hydrogencarbonate indicator be in test tube **A** at the end of the investigation?

[1]

- (iii) Suggest why a rubber bung is necessary in each test tube.

[1]

Examiner Only

Marks Remark

7 Diabetes is a condition in which the blood glucose control mechanism in the body fails.

(a) Give **two** symptoms of diabetes.

1. _____
2. _____ [2]

(b) Describe fully how insulin changes blood glucose levels.

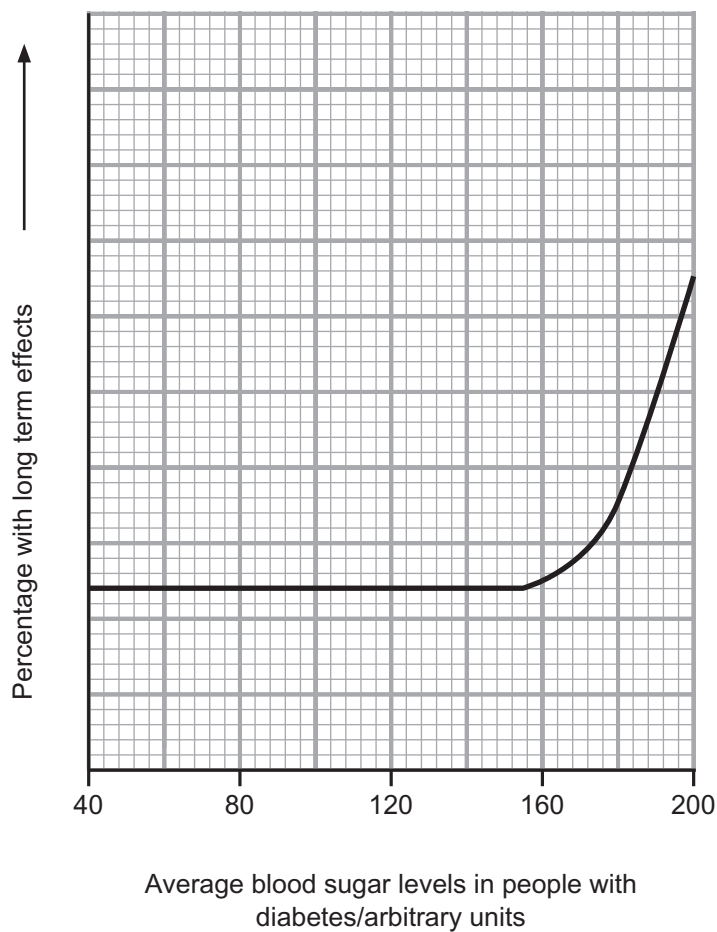
[3]

(c) Suggest **two** reasons why the number of young people with Type 2 diabetes is increasing in the UK.

1. _____
2. _____ [2]

Examiner Only	
Marks	Remark

(d) The graph below shows the relationship between the percentage of people who have long term effects from diabetes and their average blood sugar levels.



(i) Describe fully the trend shown by the graph.

[2]

(ii) Give **one** long term effect of diabetes.

[1]

Examiner Only	
Marks	Remark

8 The majority of scientists agree that it is vital to maintain biodiversity.

(a) Explain what is meant by the term **biodiversity**.

_____ [2]

(b) Scientists investigated two woodland sites to compare their biodiversity.

The results are shown in the table below.

	Number of each species in 1 m ²	
	site 1	site 2
species A	5	3
species B	7	18
species C	3	0
species D	9	19
species E	7	0
Total	31	40

(i) Using the information given state **one** thing the scientists did to make the investigation valid (fair test).

_____ [1]

(ii) Which site (1 or 2) is the most biodiverse? Explain your choice.

_____ [1]

Examiner Only

Marks Remark

(iii) Calculate the percentage of species **B** in site 2.

(Show your working out.)

_____ % [2]

(c) Suggest **two** strategies which can increase biodiversity.

1. _____

2. _____

_____ [2]

Examiner Only

Marks

Remark

9 While working in his laboratory in 1928 a scientist discovered penicillin. It was used to treat the first patient in 1942 and has saved millions of lives since then.

(a) Name the scientist who discovered penicillin.

_____ [1]

(b) In the development of a new drug there are several stages of testing.

(i) The first stage is in-vitro testing. Give **one** reason for this stage.

_____ [1]

(ii) Many people are against testing drugs on animals because they feel it is cruel. Suggest **one** other reason for opposing animal testing.

_____ [1]

(iii) Name the stage that involves testing on humans and give **one** reason for this stage.

_____ [2]

(c) The growing of genetically modified (GM) crops also involves several stages of testing.

(i) Explain the term **genetically modified**.

_____ [1]

(ii) Give **one** reason why some farmers are in favour of growing GM crops.

_____ [1]

Examiner Only

Marks Remark

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(Questions continue overleaf)

10 Describe Darwin's theory of evolution. Your answer should include an explanation of why it has taken so long to be accepted by some of the scientific community and why some people may never accept it.

In this question you will be assessed on your written communication skills including the use of specialist scientific terms.

[6]

Examiner Only	
Marks	Remark

THIS IS THE END OF THE QUESTION PAPER

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