New Specification

Rewarding Learning

Centre Number

Candidate Number

General Certificate of Secondary Education
2017–2018

Double Award Science: Biology

Unit B1

Foundation Tier

[GDW11]

GDW11

TUESDAY 15 MAY 2018, AFTERNOON

TIME

1 hour.

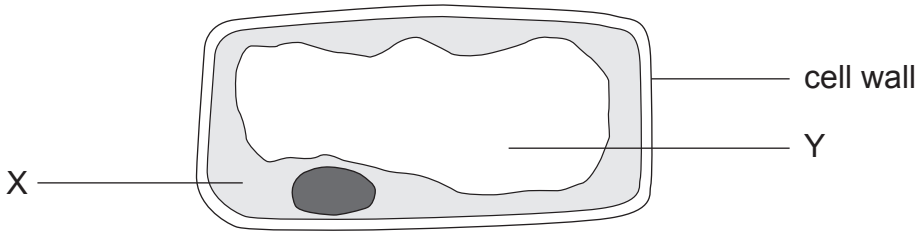
INSTRUCTIONS TO CANDIDATES

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 eight** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 60.
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 **8**.

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



(i) Name part X.

_____ [1]

(ii) Give the function of the cell wall.

_____

_____ [1]

(iii) Name part Y.

_____ [1]

(b) The table below shows four cell parts.

Complete the table below by writing in the empty boxes to show if these cell parts are present in animal and bacterial cells.

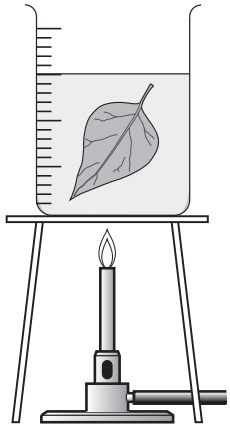
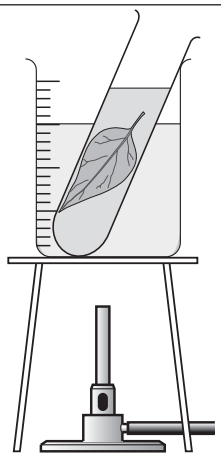
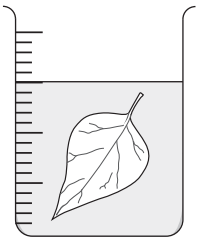
Write a tick (✓) to show if the cell part is present and a cross (✗) if it is absent. The answer for the cell wall is given.

Cell part	Cell part present/absent in:	
	Animal	Bacteria
Cell wall	✗	✓
Chloroplast		
Plasmid		
Nucleus		

[3]

2 **(a)** A student destarched a plant by placing it in a dark cupboard for 2 days. He placed the plant in sunlight for two days and then removed a leaf to carry out the starch test.

(i) Complete the table below about the starch test by writing in the empty boxes.

Step	Diagram	Description	Explanation
1			To kill the leaf.
2		Place the leaf in boiling alcohol.	
3		Dip the leaf in warm water.	

Source: Chief Examiner

[3]

11658.03**R**

After step 3 the student tested the leaf for starch.
He found that starch was present in the leaf.

(ii) Explain why starch was present in the leaf.

_____

_____ [1]

(iii) Name the reagent he used to test the leaf for starch.

_____ [1]

(iv) Give the colour change in the reagent.

_____ to blue-black [1]

(b) Starch is a complex carbohydrate.

Name **two simple** carbohydrates.

1. _____

2. _____ [2]

3 Respiration is the process where energy is released from food.

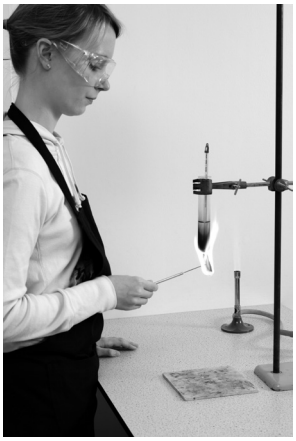
(a) Complete the word equation for respiration by writing in the empty boxes.

glucose	+		→		+		+	energy

[3]

(b) A pupil carried out an investigation into the energy content of three types of crisps, A, B and C.
She used one gram of each crisp.
She burned the crisps under a boiling tube containing **25 g** of water.
She recorded the temperature of the water before and after burning the crisp and calculated the rise in temperature.

The photograph below shows the pupil burning the crisp.



© Trevor Clifford Photography / Science Photo Library

The table below shows some of her results.

Type of crisp	Rise in temperature of the water/°C	Energy content of each crisp/J
A	20	2100
B	22	2310
C	23	

Source: Principal Examiner

The energy content of each crisp is calculated using the formula.

Energy content of each crisp (J) = mass of water (g) × temperature rise (°C) × 4.2

(i) Use the data in the table opposite to calculate the energy content of **crisp C**.

Show your working.

_____ J [2]

(ii) One crisp was baked and two were cooked in oil.
Which type of crisp, **A, B or C**, was baked?

Type of crisp _____ [1]

(iii) Suggest **two** reasons why not all of the energy in each type of crisp was used to heat the water.

1. _____

_____

2. _____

_____ [2]

[Turn over

4 Read the following passage about the factors which affect the house sparrow population in Bristol and then answer the questions that follow.

> Cats kill 45 percent of house sparrows in Bristol each year.
>
> House sparrows feed on caterpillars.
>
> The number of trees where caterpillars live and feed has decreased.
>
> Modern buildings have less nesting spaces for house sparrows.

Adapted from © RSPB and © BTO

(a) Other than cats, give **two** factors given in the passage which affect the population of house sparrows.

1. _____

_____

2. _____

_____ [2]

(b) **(i)** Use the information in the passage to draw a food chain containing **four** organisms.

[2]

(ii) Give the energy source for this food chain.

_____ [1]

(c) There are 5.3 million **breeding pairs** of house sparrows in the United Kingdom.
Use the information for Bristol on the page opposite to estimate the number of house sparrows killed in the **United Kingdom** by cats in one year.
Give your answer to **one** decimal place.

Show your working.

_____ million [3]

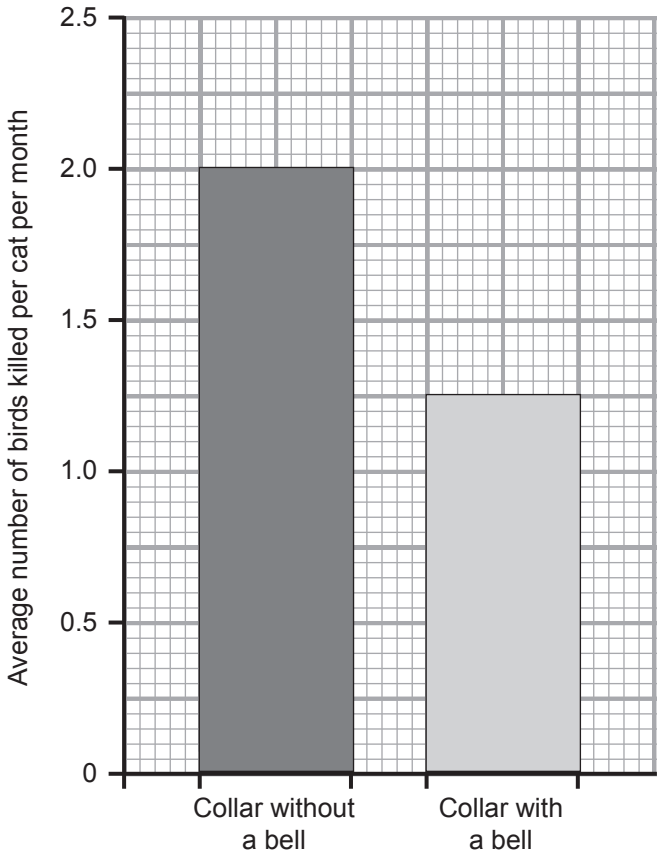
[Turn over

A separate study tested two types of cat collars to show how they affected the number of birds killed by cats.

The types of collar the cats wore were as follows:

- a collar without a bell
- a collar with a bell

The bar chart shows the results of the study.



Adapted from © RSPB

Three statements are given in the table below.

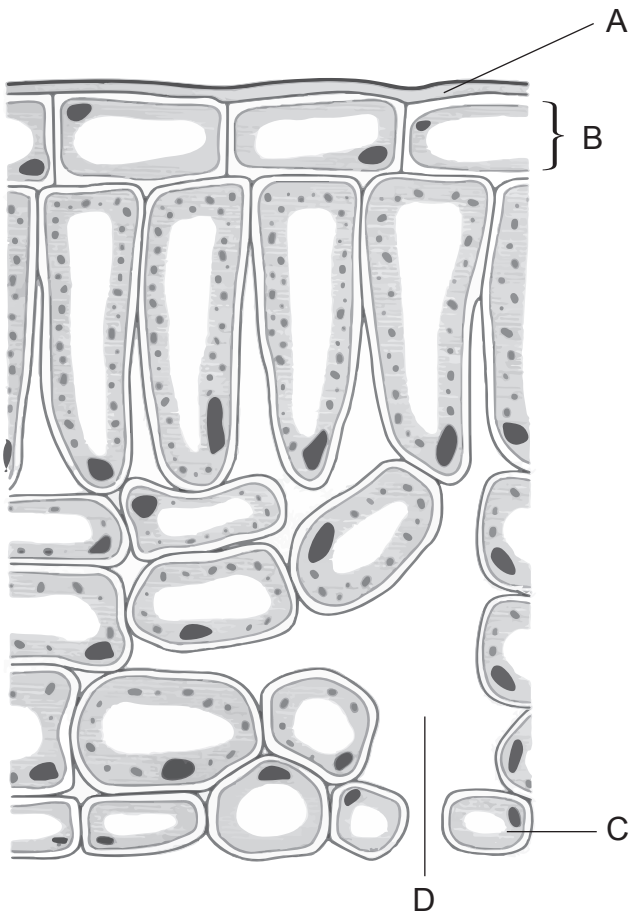
(d) Using the data in the bar chart opposite write a tick (✓) in the box which describes each statement.

Statement	Correct	Incorrect	Cannot tell from data
The collar with a bell reduced the number of birds killed by 50% compared to a collar without a bell.			
The collar without a bell resulted in more birds killed compared to a collar with a bell.			
Cats without a collar killed the most birds.			

[3]

[Turn over

5 **(a)** The diagram shows the cross section of a leaf.



(i) Name layer B.

_____ [1]

(ii) Name cell C.

_____ [1]

(b) A is the cuticle.

(i) Give **one** way the cuticle is adapted for light absorption.

_____

_____ [1]

(ii) Give **one** way the cuticle is adapted to reduce water loss.

_____

_____ [1]

(c) Name D and give its function.

Name _____

Function _____

_____ [2]

[Turn over

6 A man completed a questionnaire to estimate his risk of developing diabetes in the next 10 years.
Some information about the man is given below.

> The man is 64 years old.
>
> He is being treated for high blood pressure.
>
> His brother has diabetes.

The table below shows three questions from the questionnaire and the point scoring system used.

(a) Use the information above about the man to complete his questionnaire.
Write the points he scored in the empty boxes in the table below.
The points scored for the first question are given.

Question	Point scoring system	Points scored
Do you have a diabetic parent, brother or sister?	Yes = 2 No = 0 Don't know = 1	2
Are you being treated for high blood pressure?	Yes = 2 No = 0 Don't know = 1	
What age are you?	40–49 = 0 50–59 = 1 over 60 = 2	

[2]

(b) Which type of diabetes is this man most likely to develop in the next 10 years?

_____ [1]

(c) The results from the questionnaire showed this man has a high risk of developing diabetes in the next 10 years.

Suggest **two** lifestyle changes he should make to reduce his risk of developing diabetes in the next 10 years.

1. _____

_____

2. _____

_____ [2]

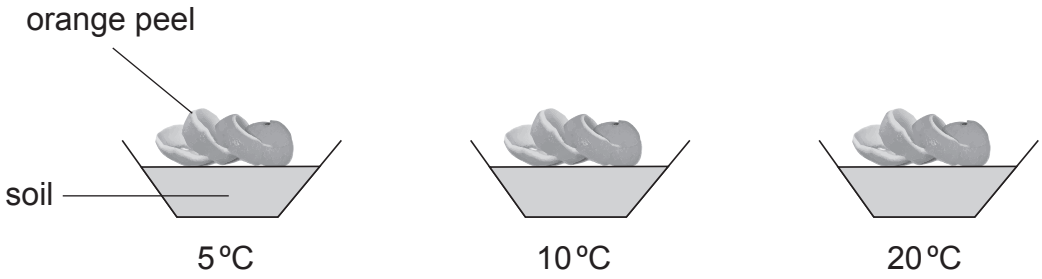
(d) Give **one** possible long-term effect of diabetes.

_____ [1]

[Turn over

7 Pupils carried out an investigation into the effect of temperature on the rate of decomposition of orange peel.
They placed the same mass of orange peel in three dishes containing soil.
Each dish was kept at a different temperature for four weeks.
The pupils recorded the percentage of orange peel **remaining** at the end of each week for four weeks.

The diagram shows their set-up at the start of the experiment.



The table below gives the pupils' results.

Temperature orange peel is kept at/°C	Percentage of orange peel **remaining** at the end of:			
	Week 1	**Week 2**	**Week 3**	**Week 4**
5	100	90	75	60
10	95	80	60	40
20	90	70	45	20

(a) What percentage of orange peel had **decomposed** by the end of **week 4** at 5 °C?

_____ % [1]

(b) What effect did temperature have on the rate of **decomposition** of the orange peel over the four weeks?
Give data from week four to support your answer.

_____

_____

_____

_____ [2]

(c) **(i)** Other than temperature, name **one** factor that can affect the rate of decomposition.

_____ [1]

(ii) Name the **two** types of microorganism that can carry out decomposition.

1. _____

2. _____ [2]

(iii) Describe how these microorganisms carry out the decomposition of the orange peel.

_____

_____

_____

_____

_____

_____

_____

_____ [3]

[Turn over

8 Enzymes are biological catalysts that speed up the rate of reactions.
Use your knowledge of enzyme structure to describe and explain how enzyme controlled reactions are affected by the following:

- low temperature
- optimum temperature
- very high temperature

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

[6]

THIS IS THE END OF THE QUESTION PAPER

DO NOT WRITE ON THIS PAGE

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

Examiner Number