

New
Specification

General Certificate of Secondary Education
2018

Centre Number

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Candidate Number

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Double Award Science: Biology

Unit B1
Foundation Tier

[GDW11]



WEDNESDAY 21 FEBRUARY 2018, 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 eight** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 60.

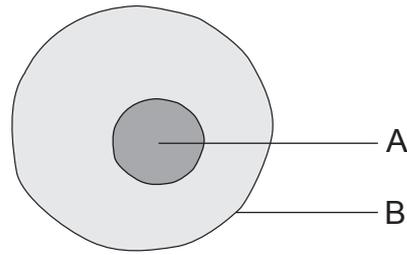
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

Quality of written communication will be assessed in Question **6**.

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

Total Marks	
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1 (a) The diagram shows an animal cell.



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(i) Name parts A and B.

A _____

B _____

[2]

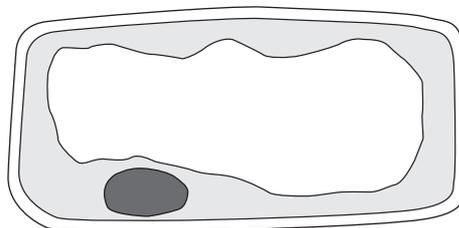
(ii) Give the function of part A.

_____ [1]

(iii) Give the function of part B.

_____ [1]

(b) The diagram shows a plant cell.



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Name **two** structures present in **this** plant cell that are not present in an animal cell.

1 _____

2 _____

[2]

Examiner Only	
Marks	Remark

(c) Complete the sentence below by writing the correct word in the blank space.

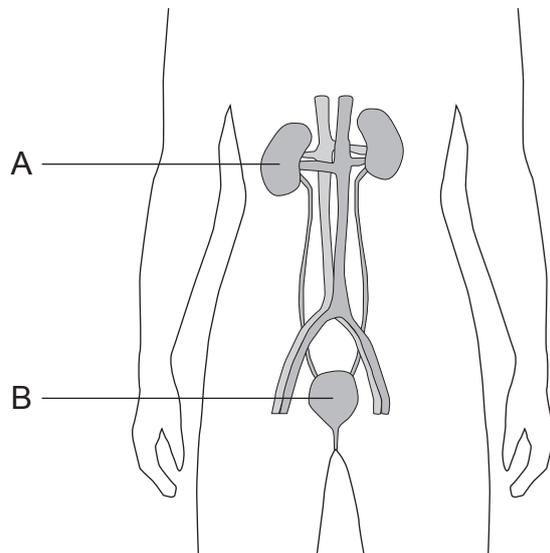
Choose the correct word from the list.

hormone	process	tissue
---------	---------	--------

A group of specialised cells that have a similar structure and function is called a _____.

[1]

The diagram below shows part of the excretory system in a human body.



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(d) Name organs A and B.

A _____

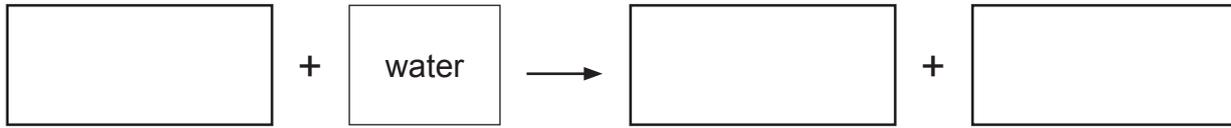
B _____

[2]

Examiner Only	
Marks	Remark

2 Plant leaves carry out photosynthesis.

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

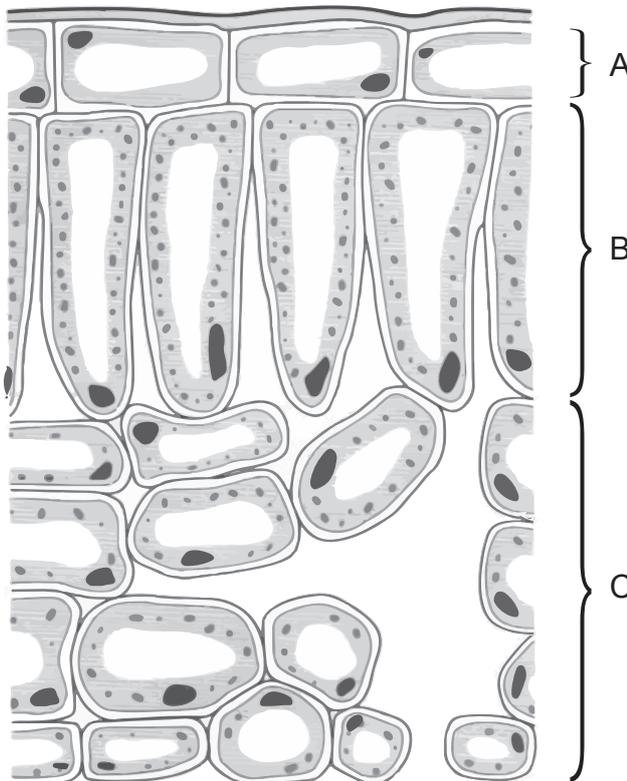


[3]

(b) Name the plant cells that take in water from the soil.

[1]

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



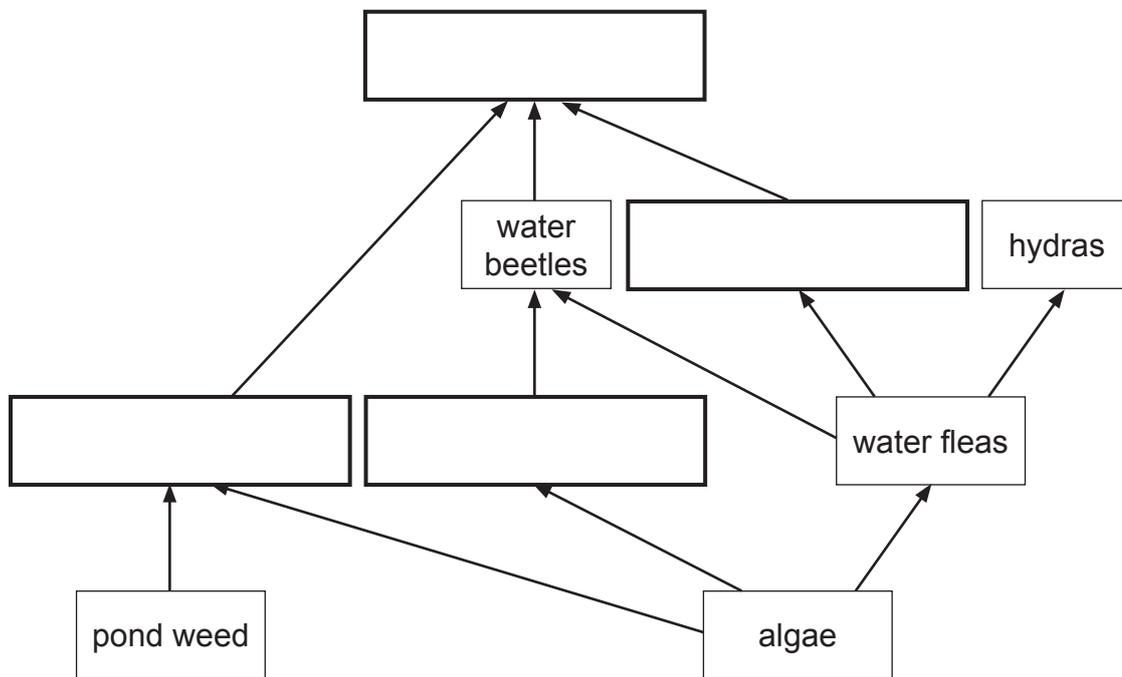
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Examiner Only	
Marks	Remark

3 The sentences below give information about feeding relationships in a pond.

Pond snails feed on pond weed and algae.
 Hydras feed on water fleas.
 Mayfly larvae and water fleas feed on algae.
 Water beetles feed on mayfly larvae and water fleas.
 Pond skaters feed on water fleas.
 Roach feed on pond snails, water beetles and pond skaters.

(a) Complete the food web using the information given above.



Source: Principal Examiner

[4]

(b) What do the arrows in the food web represent?

_____ [1]

(c) Name **one** organism from the food web that is feeding at two different trophic levels.

_____ [1]

Examiner Only	
Marks	Remark

The number of water fleas in the pond suddenly decreased.

(d) Describe and explain how this would affect the **hydra** population in the pond.

[2]

Examiner Only	
Marks	Remark

4 The diagram below shows three food substances and three test reagents.

(a) Draw a line to link each food substance to the correct test reagent.

Food substance	Test reagent
reducing sugar (glucose)	iodine solution
starch	Benedict's solution
protein	Biuret reagent

[2]

A student carried out food tests on a white powder. She tested the powder for the presence of reducing sugar (glucose), starch and protein. The powder tested positive for each of the three food substances.

(b) Use this information to complete the table below by writing in the boxes.

Food substance	Change in colour of test reagent with positive result
reducing sugar (glucose)	blue to _____
starch	yellow-brown to _____
protein	blue to _____

[3]

Glucose is an example of a simple carbohydrate.

(c) Give **two** examples of **complex** carbohydrates.

1 _____

2 _____

[2]

5 (a) Diabetes is a condition in which the blood glucose control mechanism fails.

(i) Give **one** symptom of diabetes.

_____ [1]

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

_____ [1]

There are two types of diabetes, Type 1 and Type 2.

(b) What changes in insulin production occur in the pancreas that result in each type of diabetes?

Type 1 _____

Type 2 _____

_____ [2]

(c) How is Type 1 diabetes treated?

_____ [1]

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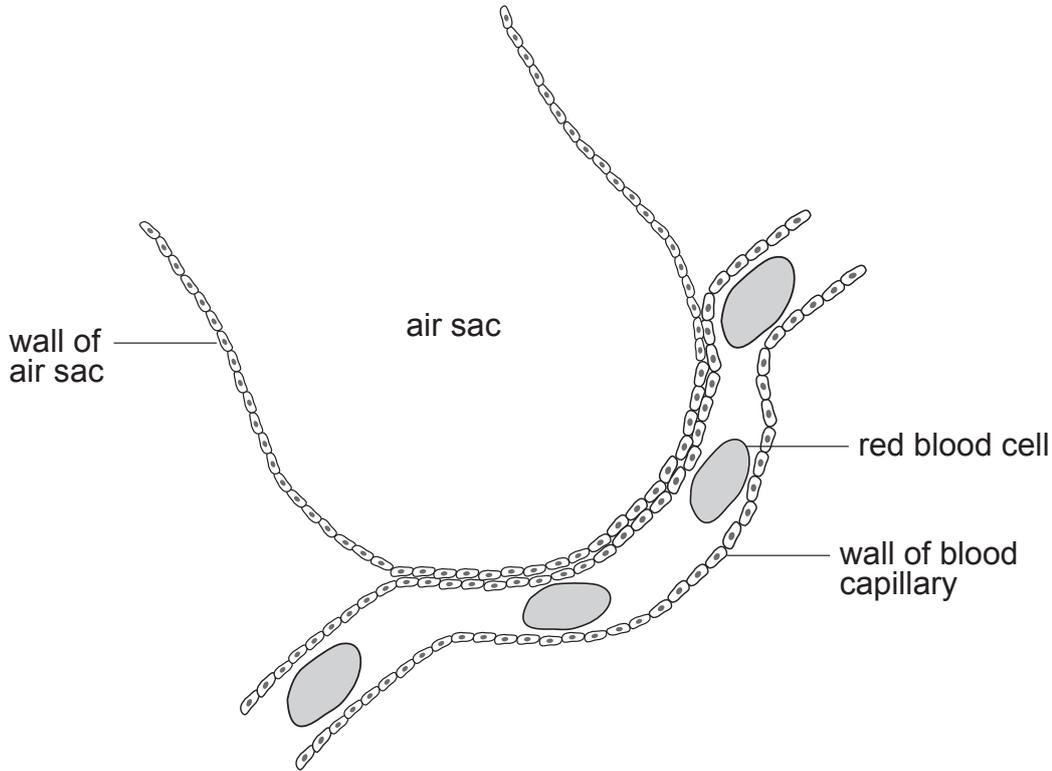
Marks

Remark

6 Respiratory surfaces are the parts of the body where gas exchange takes place between the atmosphere and the blood.

In humans, gas exchange takes place across numerous air sacs in the lungs.

The diagram shows an air sac and a blood capillary.



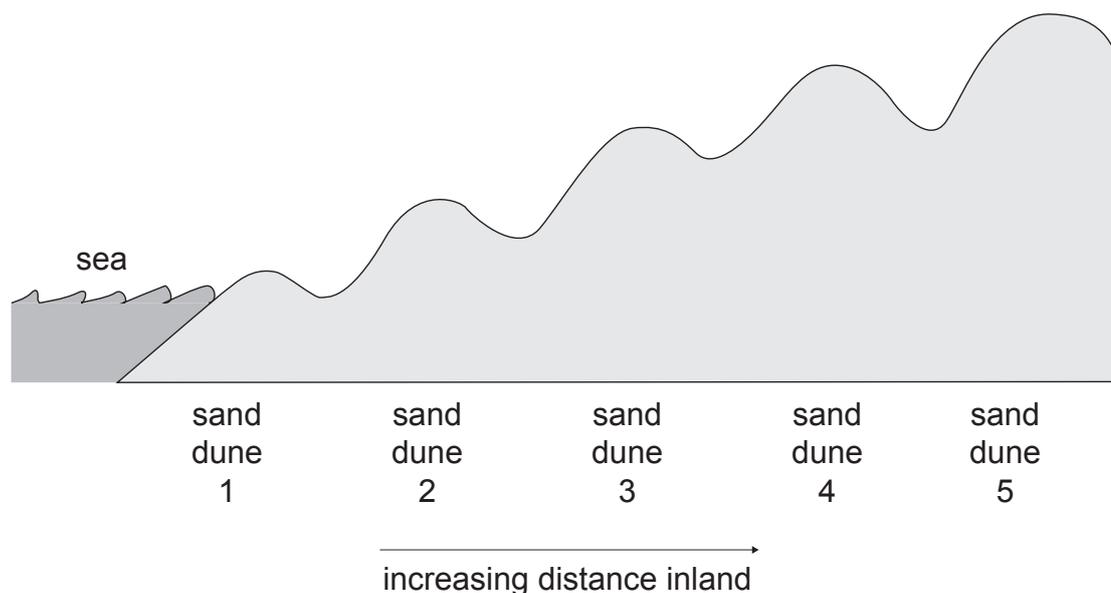
Use the diagram to help describe how this respiratory surface is adapted for its function.

In the question you will be assessed on the quality of written communication including the use of scientific terms.

Examiner Only	
Marks	Remark

7 A group of students investigated plant distribution in sand dunes.

The diagram shows the area where they carried out the investigation.



Source: Principal Examiner

The students estimated the number of species of plants growing in each sand dune.

They also collected a soil sample from each sand dune.

They measured the moisture content, mineral content and pH of the soil.

The table shows the students' results.

Sand dune	Number of species of plants	Soil moisture content/%	Soil mineral content/ arbitrary units	pH
1	2	7.7	8.2	7.9
2	7	8.4	9.8	7.6
3	12	16.9	20.4	7.4
4	13	29.8	36.1	7.0
5	17	33.5	46.1	6.5

Source: Principal Examiner

Examiner Only

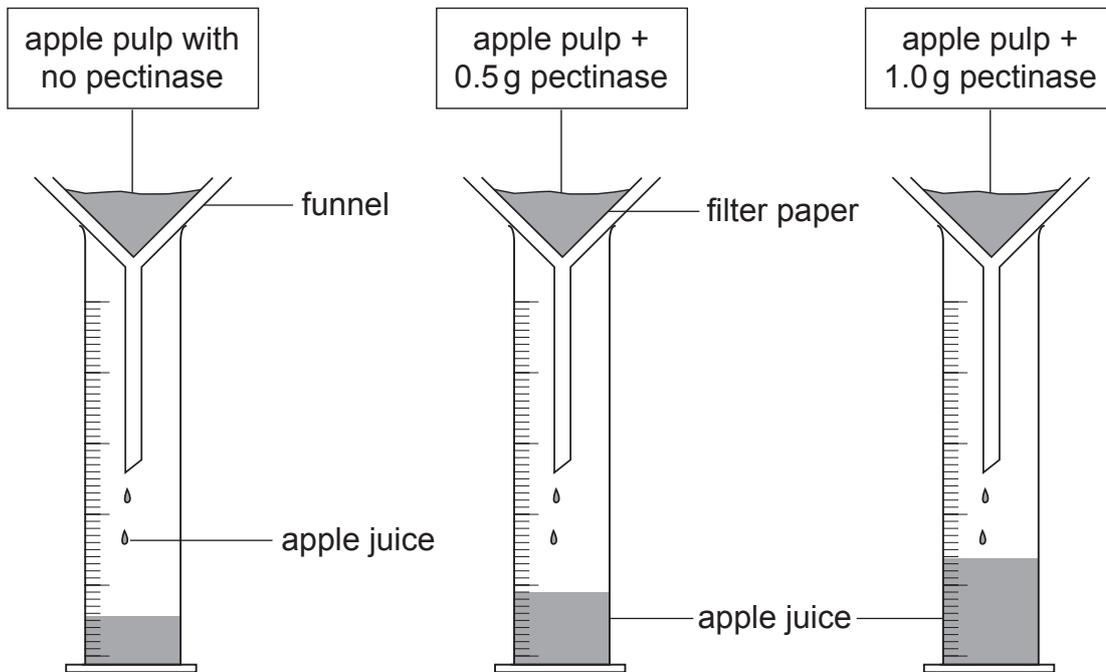
Marks Remark

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- 8 Pectinase is an enzyme used in the production of fruit juice from fruit pulp. Pectinase acts on the substrate pectin in plant cell walls. This causes more fruit juice to be released from fruit pulp.

Pupils investigated the effect of adding different masses of pectinase to the same amount of apple pulp.

The diagram shows the experimental set up.

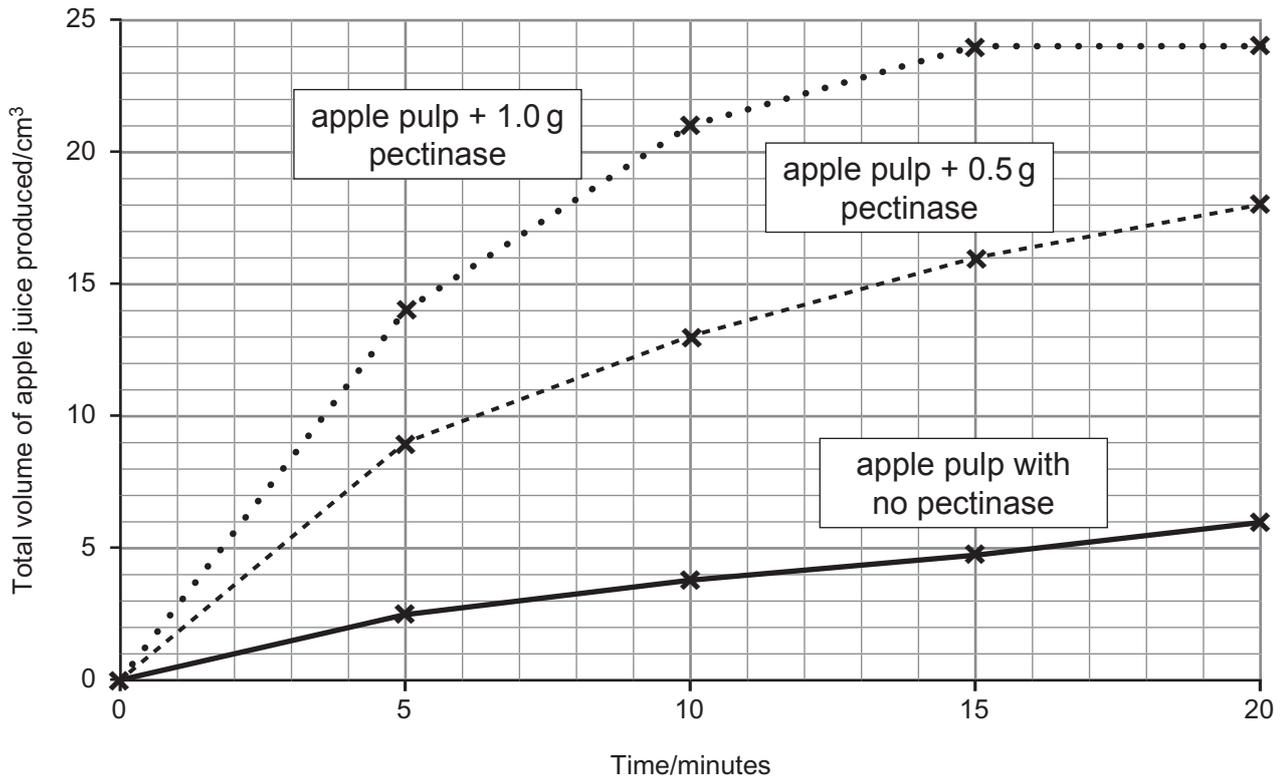


Source: Principal Examiner

Examiner Only	
Marks	Remark

(a) The pupils recorded the total volume of apple juice produced in each of the three measuring cylinders every five minutes for 20 minutes.

The graph below shows the results.



Source: Principal Examiner

Use the graph to answer the following questions.

(i) The highest volume of apple juice was produced from the apple pulp when 1 g of pectinase was used.

Use your knowledge of enzymes to explain why.

[2]

Examiner Only	
Marks	Remark

- (ii) Calculate the **percentage increase** in the total volume of apple juice produced over 20 minutes when 1 g of pectinase was used, compared to the total volume of apple juice produced when no pectinase was used.

Show your working.

_____ % [3]

- (b) When 1 g of pectinase was used, no more apple juice was produced after 15 minutes.
Suggest why.

_____ [1]

- (c) The pupils repeated the experiment with the same amount of apple pulp and 1 g of a **different enzyme**.
This enzyme does not act on the substrate pectin.

- (i) Use the results from the **graph** opposite to give the total volume of apple juice that would be produced over 20 minutes using this different enzyme.

_____ cm³ [1]

- (ii) Use your knowledge of enzyme structure to explain why this different enzyme does not act on the substrate pectin.

_____ [3]

Examiner Only	
Marks	Remark

THIS IS THE END OF THE QUESTION PAPER

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