

New
Specification

Centre Number

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Candidate Number

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General Certificate of Secondary Education
2018

Double Award Science: Biology

Unit B1
Foundation Tier

ML

[GDW11]

WEDNESDAY 21 FEBRUARY 2018, MORNING

TIME

1 hour, plus your additional time allowance.

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.

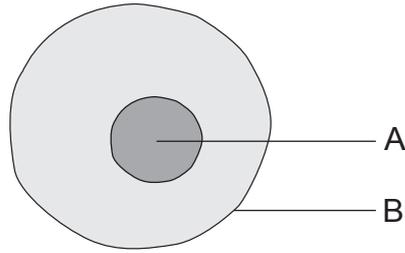
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

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) Look at the diagram below. It shows an animal cell.



© Barking Dog Art

(i) Write down the name of A

Write down the name of B

[2]

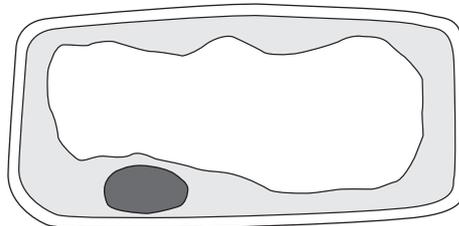
(ii) Write down the function of part A.

_____ [1]

(iii) Write down the function of part B.

_____ [1]

(b) Look at the diagram below. It shows a plant cell.



© Barking Dog Art

Write down the names of **two** structures that are in **this** plant cell that are not 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.

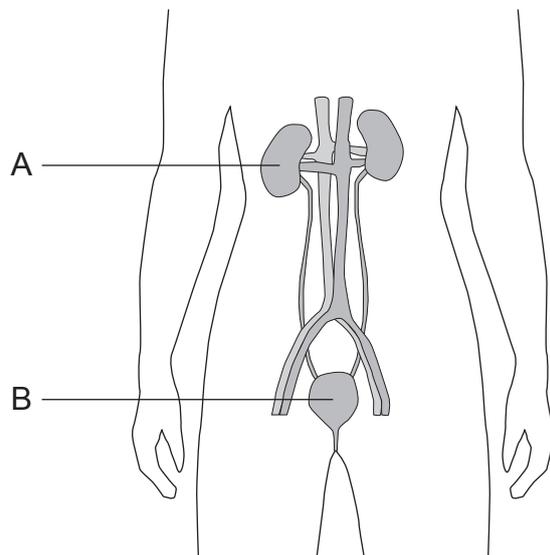
hormone	process	tissue
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A group of specialised cells that have a similar structure and function

is called a _____.

[1]

Look at the diagram below. It shows part of the excretory system in a human body.



© Barking Dog Art

(d) Write down the name of A

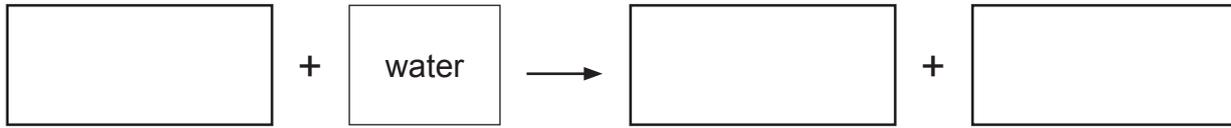
Write down the name of B

[2]

Examiner Only	
Marks	Remark

2 Photosynthesis takes place in the leaves of plants.

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

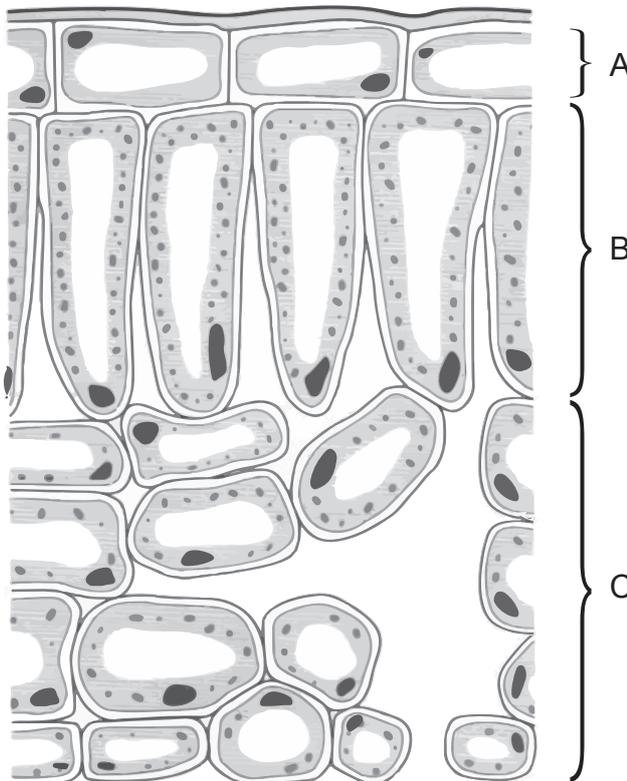


[3]

(b) Write down the name of the plant cells that take in water from the soil.

[1]

(c) Look at the diagram below. It shows the cross section of a leaf.



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Examiner Only	
Marks	Remark

(i) Write the name of layer A

Write the name of layer B

[2]

(ii) Write down the name of **one** structure that is found in the cells of layers B and C, that is **not** found in the cells of layer A.

[1]

(iii) What is the function of the structure that you wrote in your answer to part (ii) above?

[2]

(iv) Draw a line to show where gases enter and leave the leaf.

Label the line D.

Do this on the diagram on page 4.

[1]

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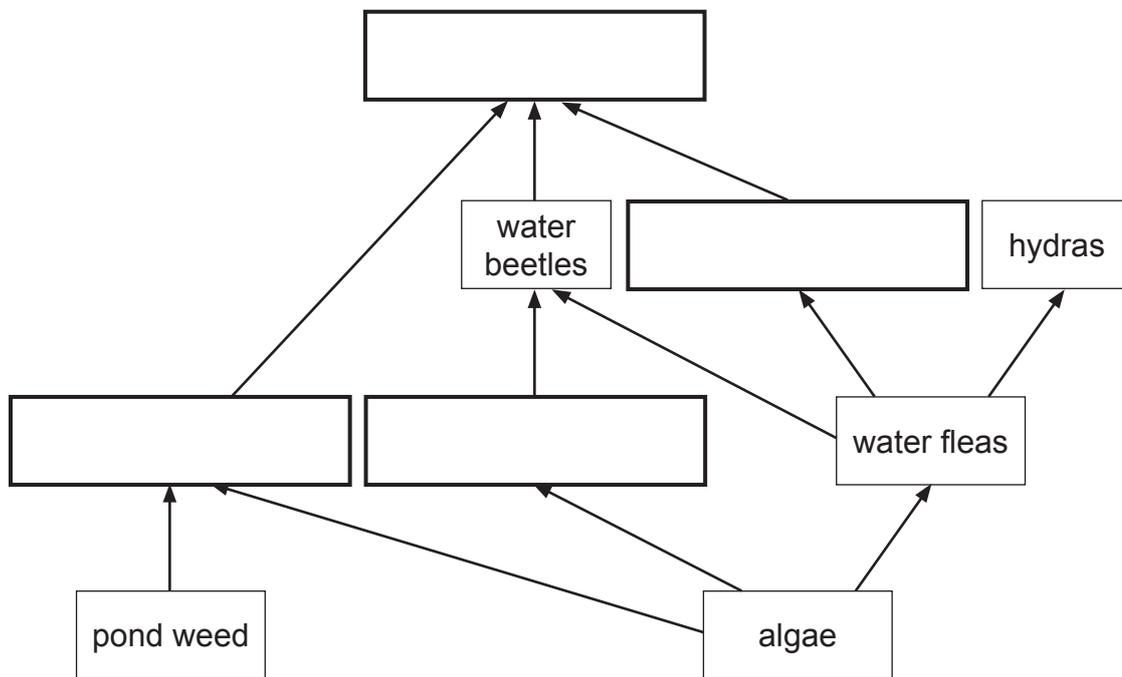
Marks

Remark

3 Read the sentences below. They 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 from the above.



Source: Principal Examiner

[4]

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

_____ [1]

(c) Write down the name of **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 Look at the diagram below. It 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 did 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 the information above 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) Write down **two** examples of **complex** carbohydrates.

1 _____

2 _____

[2]

5 (a) Diabetes is a condition that means the blood glucose control mechanism fails.

(i) Write down **one** symptom of diabetes.

_____ [1]

(ii) Write down **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 happen in the pancreas that cause each type of diabetes?

Type 1 _____

Type 2 _____

_____ [2]

(c) How is Type 1 diabetes treated?

_____ [1]

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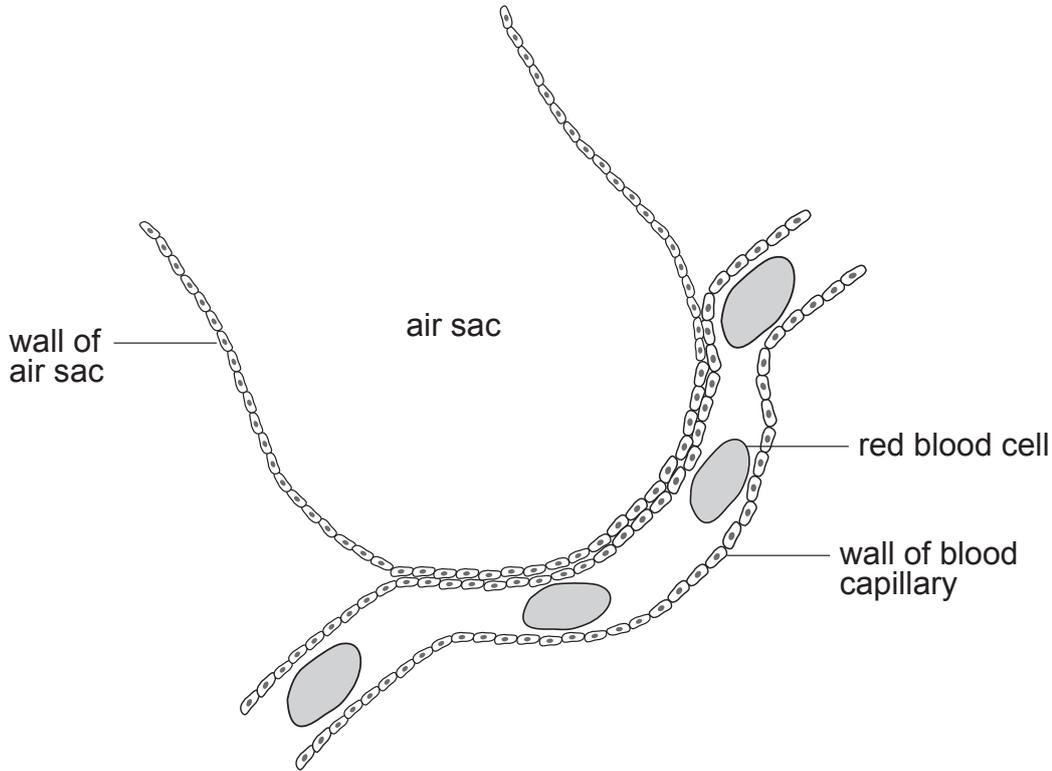
Marks

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.

Look at the diagram below. It shows an air sac and a blood capillary.



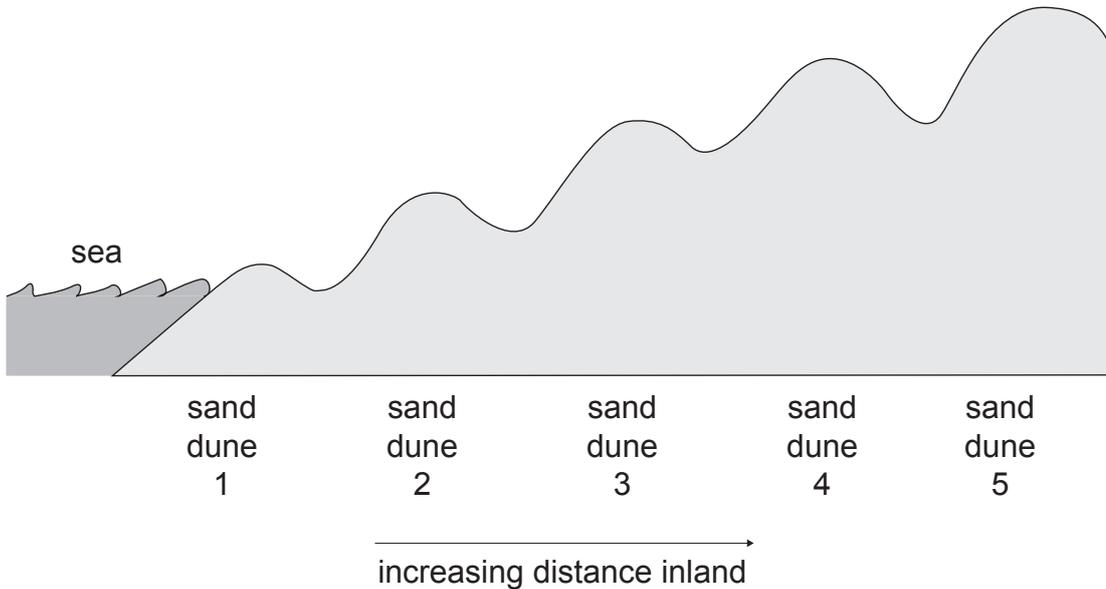
Describe how this respiratory surface is adapted for its function. Use the diagram to help you.

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.

Look at the diagram below. It shows the area where they did 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.

Look at the table below. It 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

(a) pH is one factor that affects plant distribution in sand dunes.

(i) Write down the word used to describe this type of factor.

_____ [1]

(ii) Describe how the pH changed with increasing distance inland.
Use the table opposite to help you.

_____ [1]

(b) Write down **one** biotic factor that would affect plant distribution in sand dunes.

_____ [1]

The number of species of plants in sand dune 5 was higher than in sand dune 1.

(c) Write down the reasons why.
Use the information in the table opposite to help you.

_____ [2]

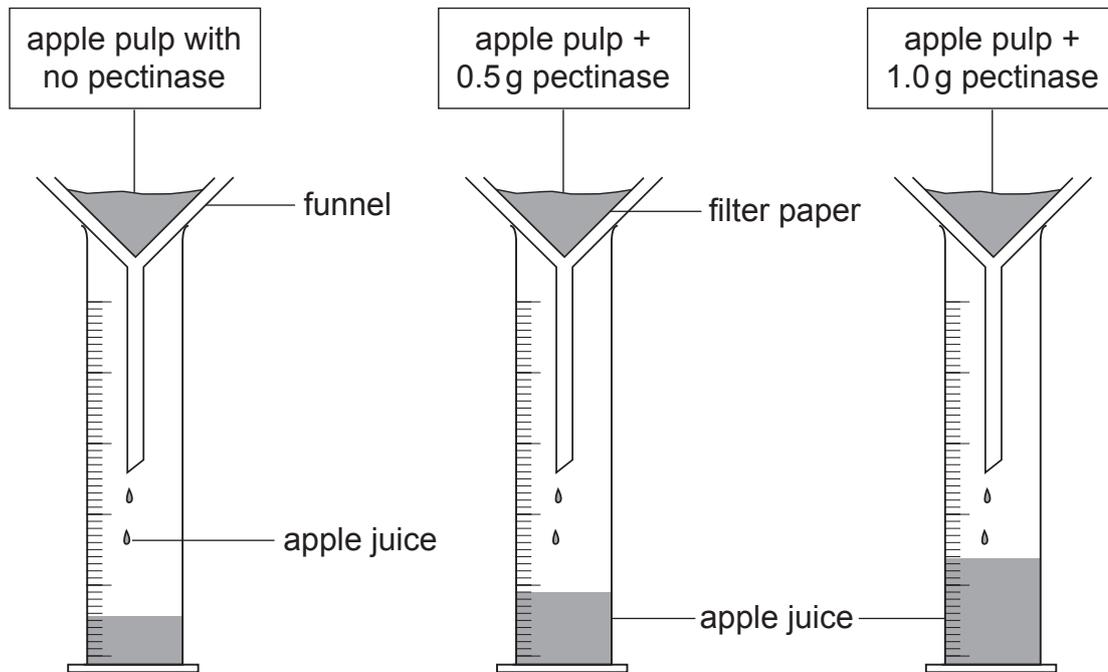
Examiner Only	
Marks	Remark

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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.

Look at the diagram below. It shows the experimental set up.

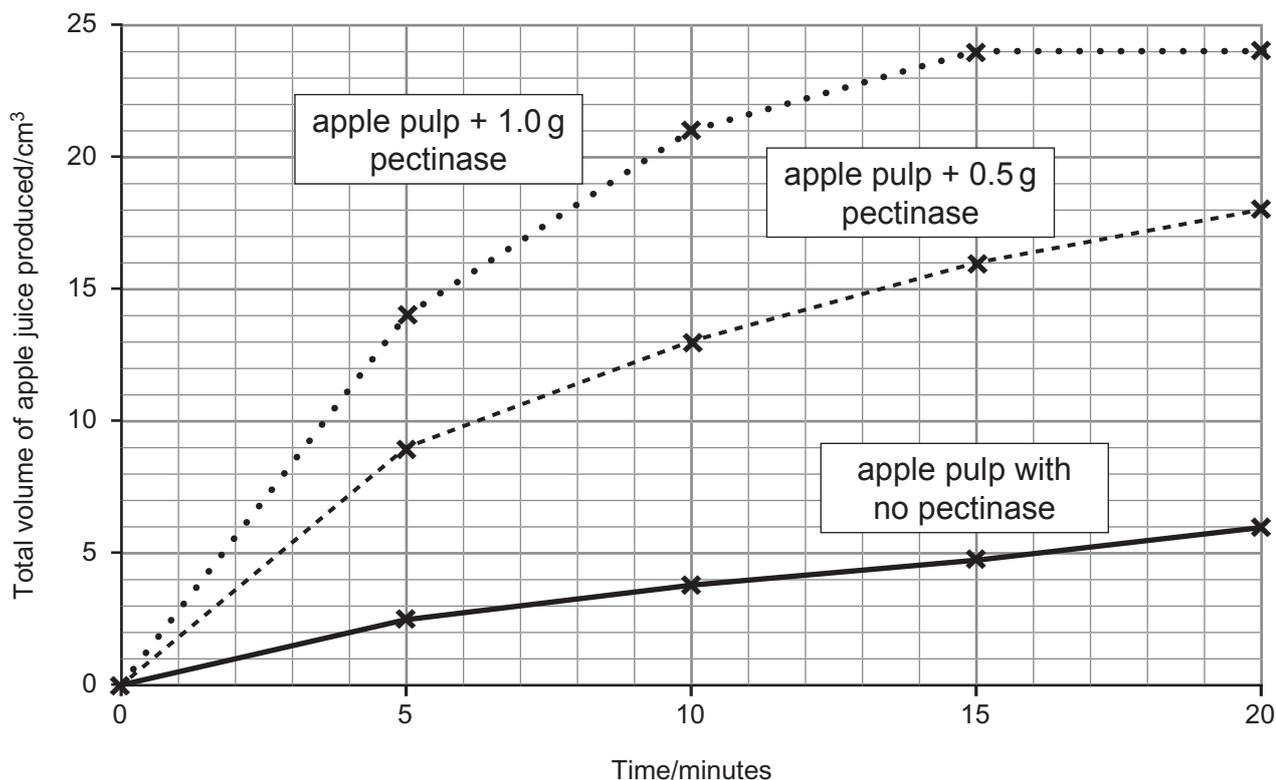


Source: Principal Examiner

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.

Look at the graph below. It 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 out.

_____ % [3]

- (b) When 1 g of pectinase was used, no more apple juice was produced after 15 minutes.
Write down a reason for this.

_____ [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** on page 16 to find out the total volume of apple juice that would be produced over 20 minutes, using this different enzyme.

_____ cm³ [1]

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

_____ [3]

Examiner Only	
Marks	Remark

THIS IS THE END OF THE QUESTION PAPER

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