



# Cambridge IGCSE™

CANDIDATE  
NAME

CENTRE  
NUMBER

--	--	--	--	--

CANDIDATE  
NUMBER

--	--	--	--



**AGRICULTURE**

**0600/11**

Paper 1 Theory

**October/November 2021**

**1 hour 45 minutes**

You must answer on the question paper.

No additional materials are needed.

## INSTRUCTIONS

- Section A: answer **all** questions.
- Section B: answer **two** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You may use a calculator.
- You should show all your working and use appropriate units.

## INFORMATION

- The total mark for this paper is 100.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **24** pages. Any blank pages are indicated.

**Section A**

Answer **all** the questions in the spaces provided.

1 Some farmers grow crops that are genetically modified (GM).

(a) (i) Describe what is meant by genetically modified (GM) crops.

.....  
.....  
..... [2]

(ii) State **two** potential benefits and **two** potential problems of growing genetically modified (GM) crops.

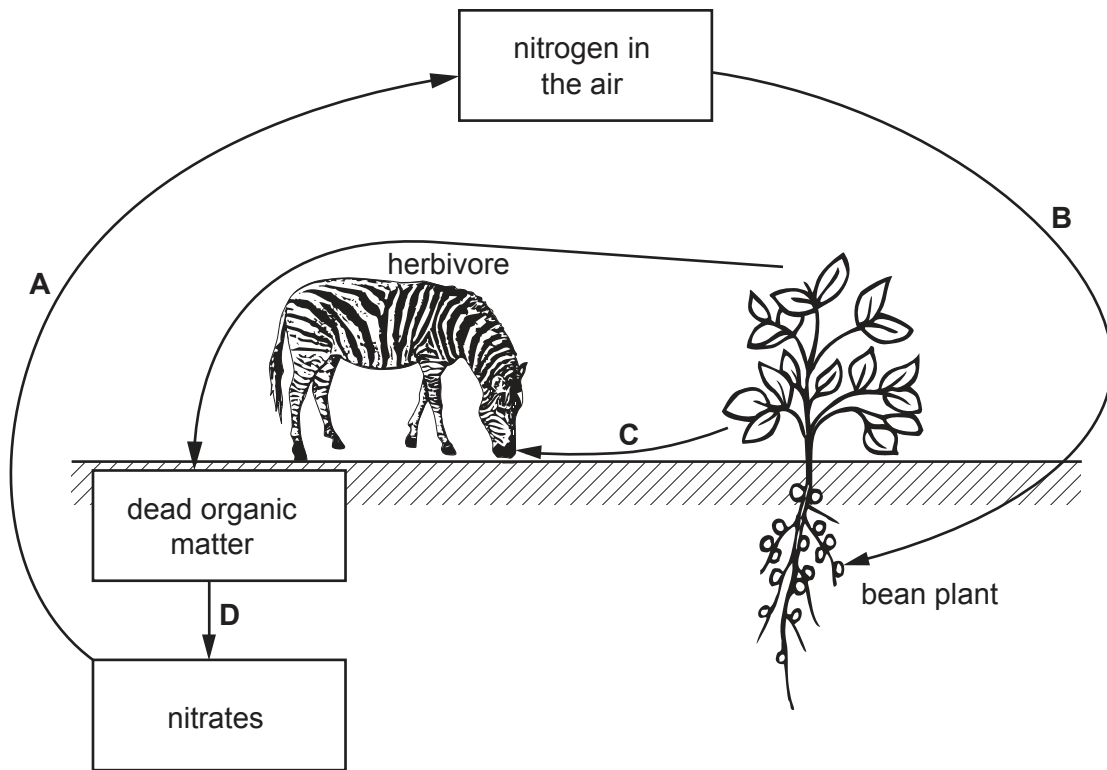
benefit 1 .....  
.....  
benefit 2 .....  
.....  
problem 1 .....  
.....  
problem 2 .....  
..... [4]

(b) Explain how some of the benefits of genetically modified (GM) crops might be achieved without using genetic modification.

.....  
.....  
..... [2]

[Total: 8]

2 The diagram shows part of the nitrogen cycle.



(a) State a letter from the diagram where each of the following processes occur:

(i) denitrification

Answer **A, B, C** or **D** ..... [1]

(ii) nitrification

Answer **A, B, C** or **D** ..... [1]

(iii) nitrogen fixation.

Answer **A, B, C** or **D** ..... [1]

(b) State **two** ways that dead organic matter improves soil structure.

1 .....

.....

2 .....

.....

[2]

(c) (i) Describe how the nitrogen cycle makes nitrogen available to plants.

.....  
.....  
.....  
..... [2]

(ii) Suggest **two** ways a farmer can add to the nitrogen available to plants.

1 .....  
.....  
2 .....  
..... [2]

[Total: 9]

3 (a) (i) Describe how plants make their own food by photosynthesis.

.....  
.....  
.....  
.....  
.....  
.....  
.....  
..... [4]

(ii) Draw **three** lines to link each structure with its main function.

<b>structure</b>	<b>main function</b>	
phloem	allow diffusion of carbon dioxide	
stomata	transport of synthesised food	
xylem	transport of water	[2]

(b) Explain **one** way that plant roots are adapted to efficiently absorb the requirements for plant growth.

adaptation .....

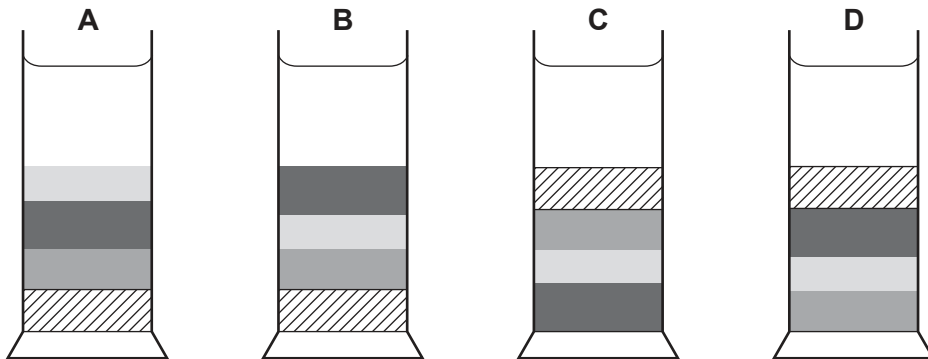
.....

explanation .....

..... [2]

[Total: 8]

- 4 (a) A student was testing a sample of soil. The sample of soil was mixed, shaken with water and allowed to settle in a measuring cylinder. The particles settle according to their size. The largest particles settle at the bottom. One of the diagrams, **A** to **D**, shows the correct result of this test.



**Key**

	water
	silt
	clay
	sand
	small stones

- (i) Which diagram shows the particles in the correct order?

Answer **A, B, C** or **D** ..... [1]

- (ii) The pH of the sample of soil was tested.

Describe **one** way to test the pH of the sample of soil.

.....

.....

.....

.....

.....

.....

..... [3]

- (iii) Suggest **one** possible source of error when testing pH in this way.

.....

..... [1]

(b) Part of soil formation involves breaking down parent material, such as rock.

Describe how parent material is broken down by chemical weathering.

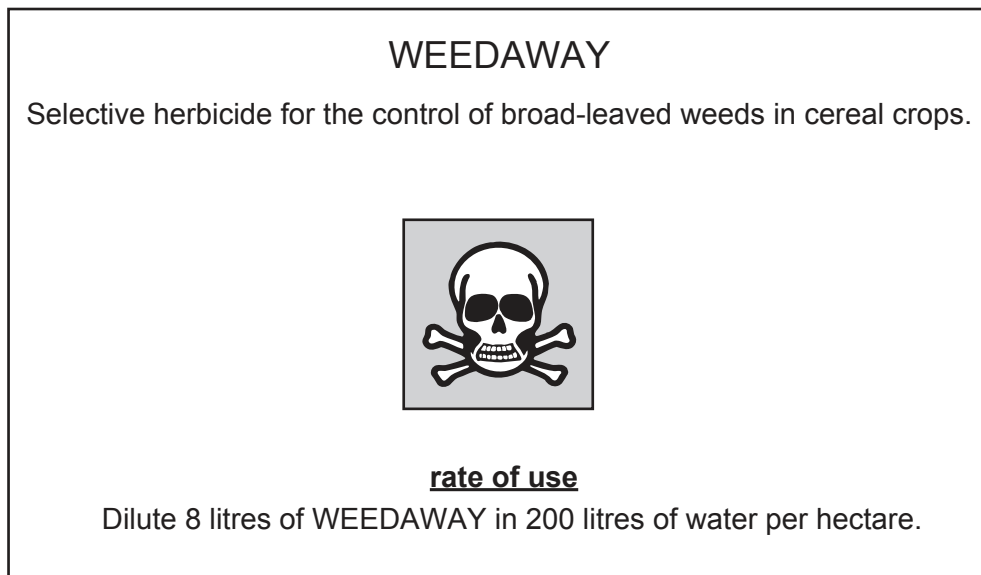
.....  
.....  
.....  
..... [2]

(c) Suggest **two** farming practices that can result in soil becoming acidic.

1 .....  
.....  
2 .....  
..... [2]

[Total: 9]

- 5 (a) Weeds can cause problems for growing crops. One method of weed control is spraying chemicals. The diagram shows part of the label from a chemical container.



- (i) Calculate the percentage of WEEDAWAY chemical in the water to be sprayed.

..... % [1]

- (ii) Calculate the volume of WEEDAWAY a farmer would need to buy to treat an area of 40 hectares. Give a unit for your answer.

volume .....

unit .....

[2]



(b) The label does **not** show any information about the safe storage of farm chemicals.

Suggest **three** ways to store farm chemicals safely.

- 1 .....
  - .....
  - 2 .....
  - .....
  - 3 .....
  - .....
- [3]

(c) Identify **one** weed species. Describe how the weed species can be controlled in crops without using chemicals.

weed species .....

control method .....

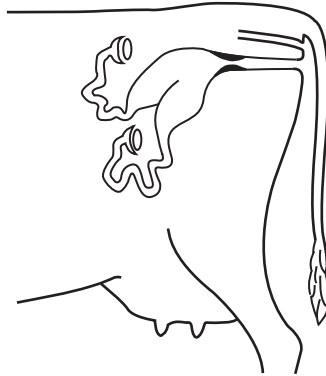
.....

[2]

[Total: 8]

- 6 (a) The diagram shows a cross-section of a female farm animal. Label the position of each of the following on the diagram.

**cervix**                      **vagina**                      **vulva**



[3]

- (b) Describe **one** function of each of the following reproductive organs:

uterus .....

.....

ovary. ....

.....

[2]

- (c) (i) Describe what is meant by artificial insemination.

.....

..... [1]

- (ii) Other than protecting endangered breeds of livestock, suggest **one** possible benefit of artificial insemination of farm animals.

.....

..... [1]

- (d) Suggest why artificial insemination could be important in protecting endangered breeds of livestock.

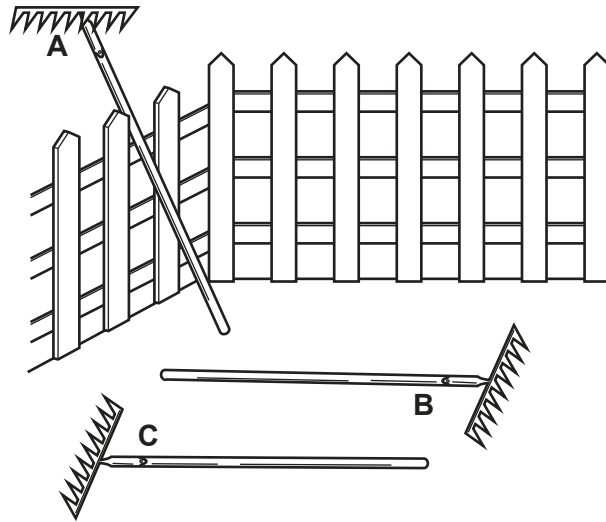
.....

..... [1]

[Total: 8]

7 A rake is a hand tool used for cultivation.

(a) The diagram shows three different positions, **A** to **C**, where a rake has been placed after being used.



Use the letter **A**, **B** or **C** to identify a position. Suggest a possible accident that could occur as a result of leaving a rake in this position.

rake position .....

possible accident .....

..... [1]

(b) (i) Describe **one** reason to use a rake for cultivation. Describe **one** way to maintain a rake after this use.

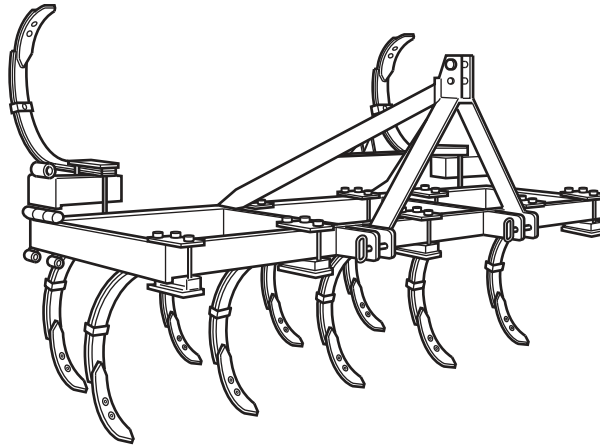
reason .....

.....

way to maintain .....

..... [2]

(ii) The diagram shows another tool used for cultivation.



Suggest **one** advantage and **one** disadvantage of using this tool compared with using a rake.

advantage .....

.....

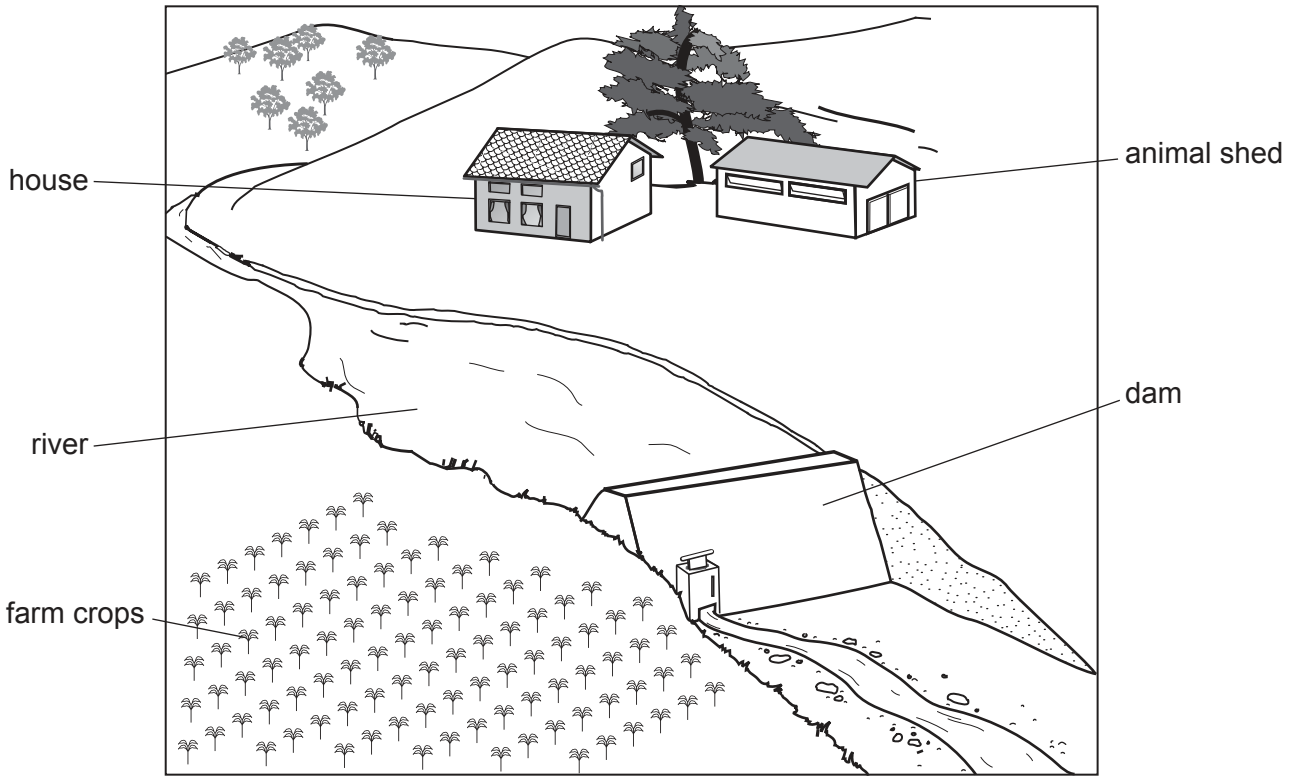
disadvantage .....

.....

[2]

[Total: 5]

8 The diagram shows how a farm collects and uses water.



(a) Describe how water could be supplied from the river to the animals in the animal shed.

.....  
.....  
.....  
.....  
.....  
..... [3]

(b) Explain **one** reason why a supply of water is important for animals and a different reason why a supply of water is important for crops.

animals .....

.....

crops .....

..... [2]

(c) Suggest why the dam is constructed to be wider at the bottom than the top.

.....

..... [1]

- 9 The condition crooked toes is shown in the photograph and can be present in some chickens at birth.



- (a) State what is meant by each of the following:

recessive .....

.....

homozygous. ....

.....

[2]

- (b) Assume that the condition crooked toes is determined by a single gene and that the allele for crooked toes, **t**, is recessive.

- (i) Draw a genetic diagram to show the expected ratio of offspring with crooked toes to offspring without crooked toes when crossing two heterozygous parents.

[4]

- (ii) State the phenotype of a chicken that has the genotype **Tt**.

..... [1]

- (iii) Explain how a farmer could reduce the likelihood of their chickens being born with the condition crooked toes.

.....

..... [1]

- (iv) Suggest why chickens with crooked toes may be less likely to survive than chickens with normal toes.

.....

..... [1]

[Total: 9]

## Section B

Answer any **two** questions.

Write the question numbers you have chosen here: .....

- 10** (a) Describe how some farmers use an enclosed grazing system. [3]  
 (b) Describe the process of rotational grazing. [4]  
 (c) Explain the benefits and potential problems of a zero-grazing system. [8]

[Total: 15]

- 11** (a) Identify a biting and chewing crop pest. Describe **three** effects of this pest on a crop. [4]  
 (b) Describe how systemic pesticides kill crop pests. [3]  
 (c) Suggest potential problems caused by the use of farm chemicals. Other than by safe storage, describe how these problems can be reduced. [8]

[Total: 15]

- 12** (a) A notifiable disease is suspected on a farm.  
 Describe what a farmer must do. Explain why this is important. [4]  
 (b) Describe the problems caused by livestock parasites. [5]  
 (c) Explain how poor housing can cause ill-health in livestock. [6]

[Total: 15]

- 13** (a) Describe what is meant by transpiration. [4]  
 (b) Describe the effects of humidity, light intensity and temperature on the rate of transpiration. [3]  
 (c) High light intensity, high temperature, high winds and frost are factors that have harmful effects on some plants.

For each factor describe **one** different harmful effect on a plant. Suggest different ways to minimise each effect. [8]

[Total: 15]

- 14** (a) Describe what is meant by a production ration. [3]  
 (b) Describe the function of **four** named parts of the non-ruminant digestive system. [4]  
 (c) Explain why ruminant animals are able to digest grass more efficiently than non-ruminant animals. [8]

[Total: 15]

















**BLANK PAGE**

---

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced online in the Cambridge Assessment International Education Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at [www.cambridgeinternational.org](http://www.cambridgeinternational.org) after the live examination series.

Cambridge Assessment International Education is part of the Cambridge Assessment Group. Cambridge Assessment is the brand name of the University of Cambridge Local Examinations Syndicate (UCLES), which itself is a department of the University of Cambridge.