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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.

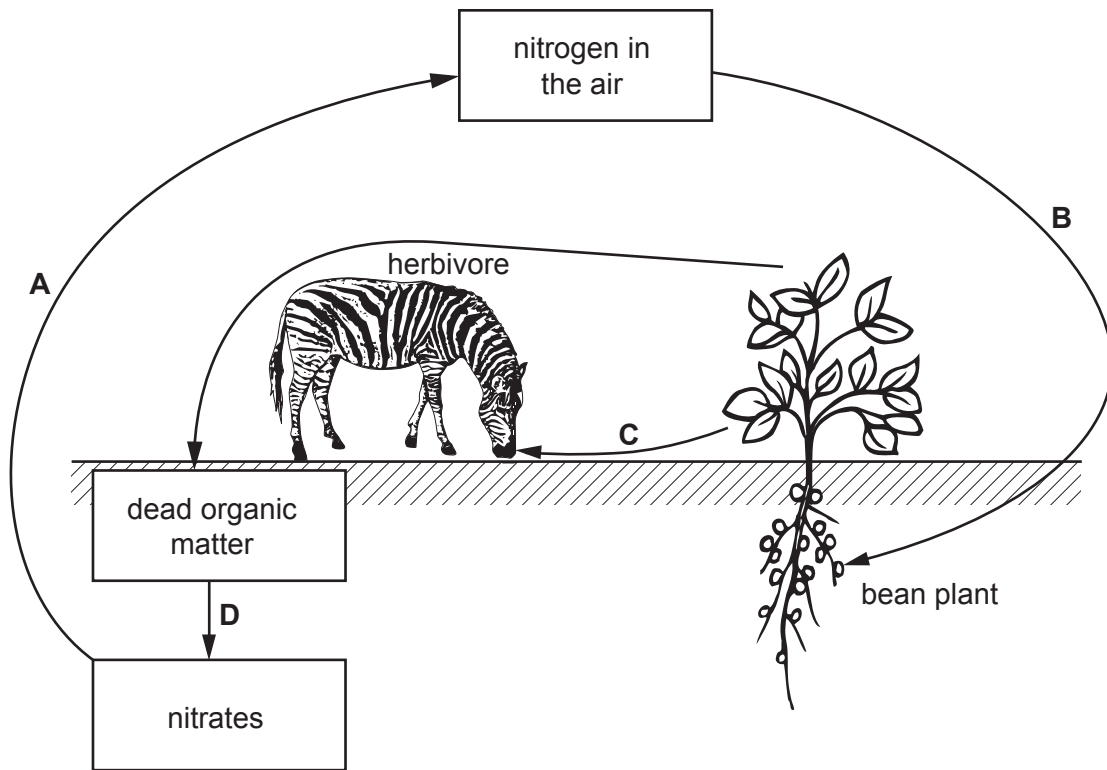
benefit 1
.....
benefit 2
.....
problem 1
.....
problem 2
..... [4]

(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.

structure	main function	
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

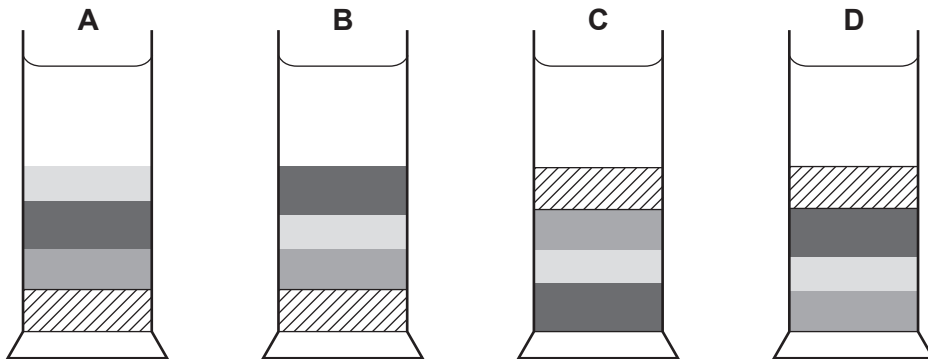
.....

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.

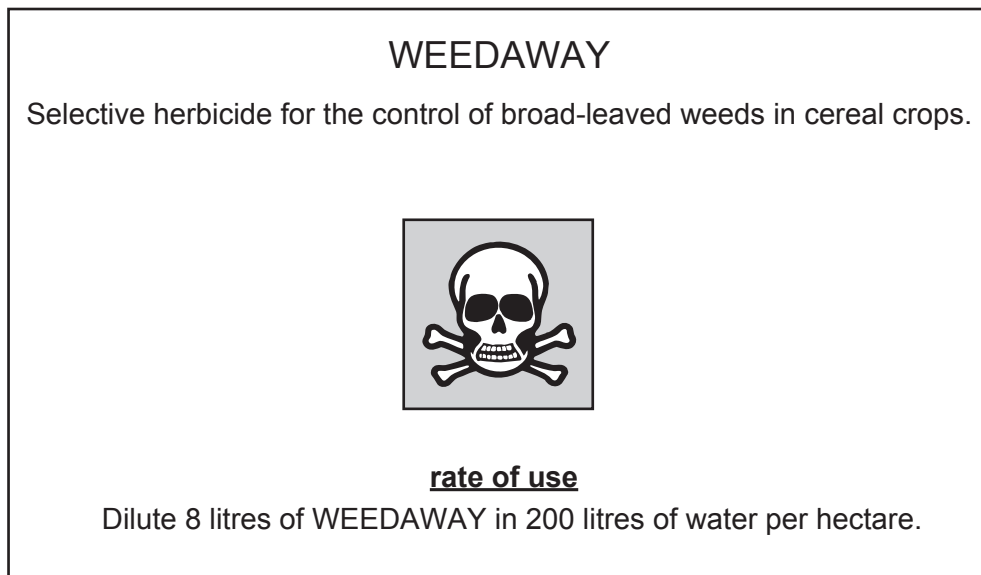
.....
.....
.....
..... [2]

(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

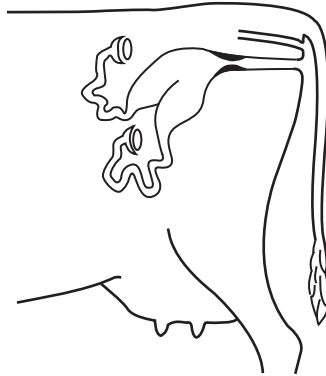
.....

[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.

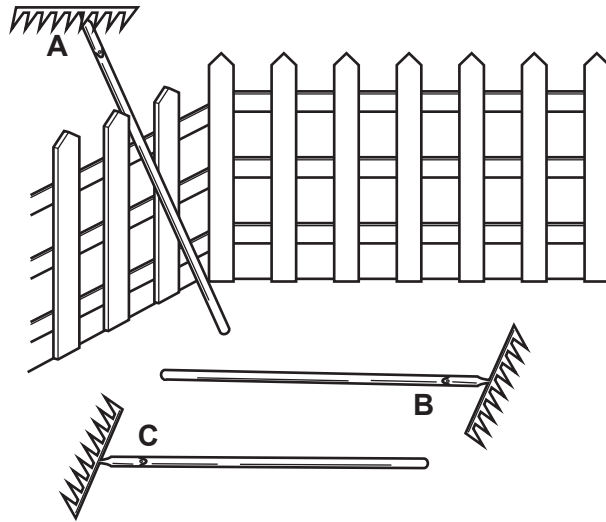
.....

..... [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.

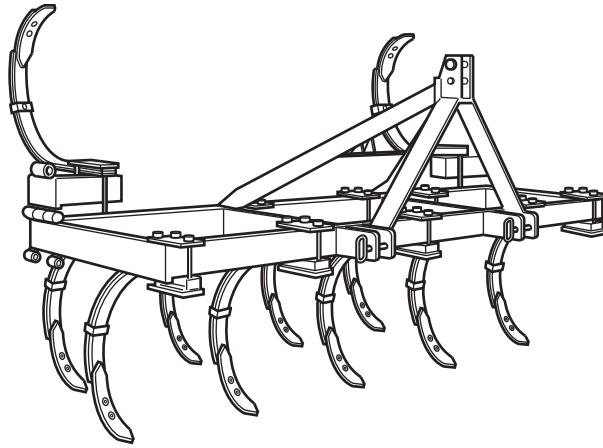
reason

.....

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

.....

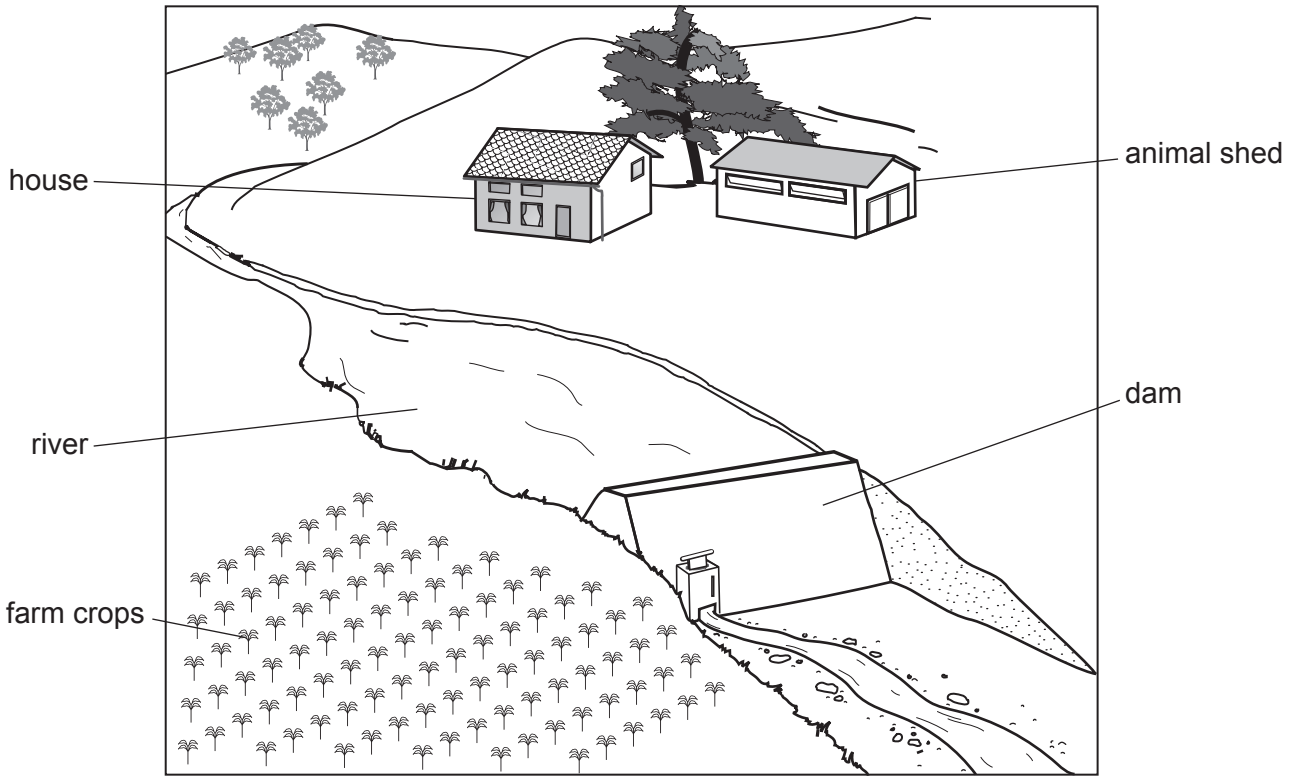
disadvantage

.....

[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]

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