Cambridge Assessment International Education

Cambridge O Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

AGRICULTURE **5038/12**

Paper 1 Theory **October/November 2024**

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 **20** pages. Any blank pages are indicated.

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Section A

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

1 **(a)** Describe **two** possible benefits and **two** possible problems of biological pest control in crops.

benefit 1 .....

.....

benefit 2 .....

.....

problem 1 .....

.....

problem 2 .....

.....

[4]

(b) Crop yields can be increased by selective breeding, by controlling pests, by controlling weeds and by avoiding soil pan formation.

Suggest **three** other ways to increase crop yields.

1 .....

.....

2 .....

.....

3 .....

.....

[3]

(c) Explain how contact pesticides control pests.

.....

.....

.....

.....

.....

..... [3]

[Total: 10]

2 **(a)** Improved crop varieties can be produced by selective breeding.

State **three** steps of selective breeding in the correct order.

step 1 .....

.....

step 2 .....

.....

step 3 .....

.....

[3]

(b) Other than high yield, suggest **one** characteristic a farmer would want to breed into a crop. Explain how this characteristic could increase farm profits.

characteristic .....

.....

explanation .....

.....

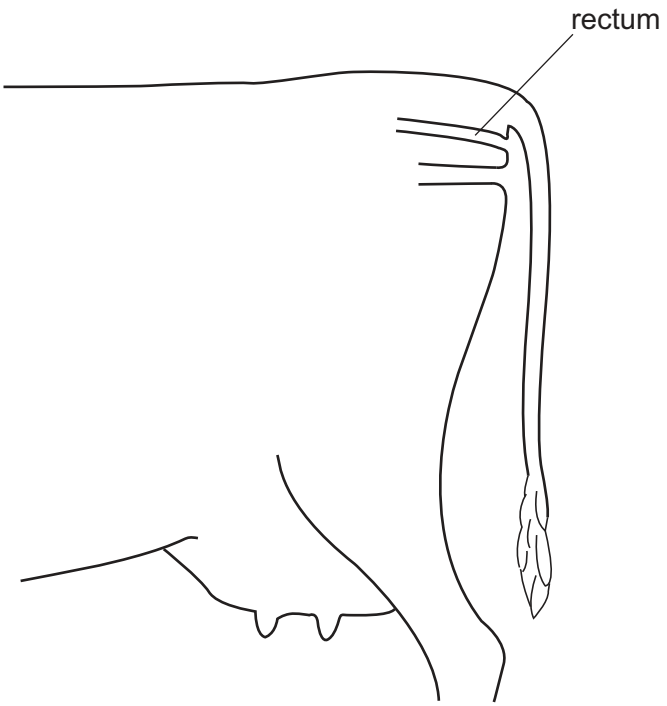
[2]

[Total: 5]

3 **(a)** The diagram shows an outline of part of a female mammalian farm animal.

Draw and label the following reproductive organs in their correct location on the diagram.

cervix **ovary** **uterus** **vagina**



[4]

(b) **(i)** State where in a female reproductive system semen should be placed during artificial insemination.

.....

..... [1]

(ii) Other than incorrectly placed semen, suggest **one** reason why the method of artificial insemination does **not** always result in pregnancy.

.....

..... [1]

(c) Explain **one** way that the nutritional requirements of a female mammalian farm animal will change during pregnancy.

change .....

.....

explanation .....

.....

[2]

[Total: 8]

4 **(a)** State what is meant by the following genetic terms:

allele

.....

.....

recessive.

.....

.....

[2]

(b) **(i)** Assume that a single gene causes a defect in sheep. This defect is recessive.

Draw a genetic diagram using the letters **D** and **d** to show the expected ratio of offspring with this defect to offspring without this defect when two heterozygous sheep are crossed.

[3]

(ii) Suggest **two** ways to reduce the presence of this defect in a flock of sheep.

1 .....

.....

2 .....

.....

[2]

[Total: 7]

5 **(a)** **(i)** State what is meant by a soil pan.

.....

.....

.....

..... [2]

(ii) Describe **two** farming practices that can cause a soil pan to form on land used for cultivating crops.

1 .....

.....

2 .....

.....

[2]

(iii) Describe how the presence of a soil pan can reduce crop yields.

.....

.....

.....

..... [2]

(b) The photograph shows a tractor modified to help prevent the formation of a soil pan.

Explain how this modification helps prevent the formation of a soil pan.

.....

..... [1]

[Total: 7]

6 **(a)** **(i)** Crop plants can be damaged by different types of pest.

Give **one** different example for each of the following types of pest:

biting and chewing .....

boring .....

piercing and sucking. .....

[3]

(ii) For each type of pest, describe a different effect that it has on crop plants.

biting and chewing

.....

.....

boring

.....

.....

piercing and sucking

.....

.....

[3]

(b) Give **one** example of biological pest control. Explain how this can be used to control pests.

example .....

.....

explanation .....

.....

.....

.....

[3]

[Total: 9]

7 **(a)** **(i)** Draw **one** line from each organ to its main digestive function.

organ	**main digestive function**
large intestine	churning and mixing
liver	nutrient absorption
small intestine	production of bile
stomach	water absorption
	chewing

[4]

(ii) Describe the function of the caecum in the non-ruminant digestive system.

.....

..... [1]

(b) Explain **one** way that the digestive system of a ruminant is more efficient at digesting grass than the digestive system of a non-ruminant.

.....

.....

.....

..... [2]

(c) Suggest **one** way that the cost of feeding ruminant animals in a zero-grazing system can be reduced.

.....

..... [1]

[Total: 8]

8 **(a)** State **three** signs of good health in farm animals.

1 .....

.....

2 .....

.....

3 .....

.....

[3]

(b) Complete the table by suggesting how each method of disease control works. Each suggestion must be different.

method of disease control	suggestion
good hygiene	
isolation of sick animals	
regular health checks	
vaccination of young stock	

[4]

(c) Suggest **one** way that diseased farm animals reduce the profit made from farm products.

.....

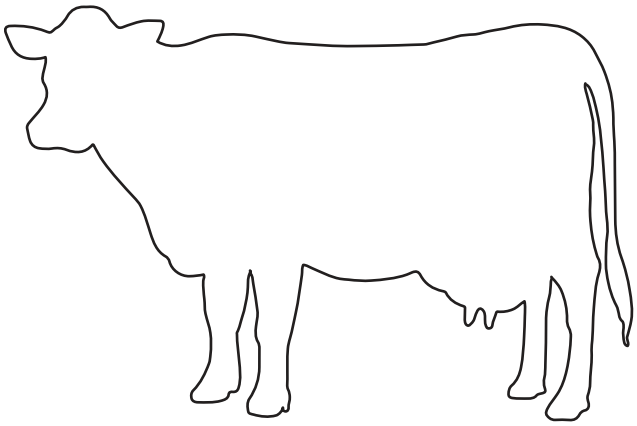
..... [1]

[Total: 8]

9 The diagram shows average milk production records from four different breeds of dairy cow.

breed **A**
11 000 kg milk
3.8% fat
3.3% protein

breed **D**
8200 kg milk
4.0% fat
3.5% protein



breed **B**
7100 kg milk
5.0% fat
3.9% protein

breed **C**
8900 kg milk
4.2% fat
3.4% protein

(a) Calculate the following:

(i) the average mass of protein produced by breed **B**

.....kg [1]

(ii) the difference between the average mass of milk produced by breed **D** and the average mass of milk produced by breed **B**.

.....kg [1]

(b) Breed **B** produces the lowest average mass of milk.

(i) Suggest **three** reasons why a farmer might decide to keep this breed of cow.

1 .....

.....

2 .....

.....

3 .....

.....

[3]

(ii) Suggest **three** possible ways of increasing the milk production of breed **B**.

1 .....

.....

2 .....

.....

3 .....

.....

[3]

[Total: 8]

Section B

Answer any **two** questions.

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

10 **(a)** Describe what is meant by organic farming. [3]

(b) Explain the possible disadvantages of an organic farming system. [6]

(c) Explain the possible benefits of growing genetically modified (GM) crops for farm profits. [6]

[Total: 15]

11 **(a)** Describe **four** different ways that weeds reduce crop growth. [4]

(b) Discuss how weeds could be controlled in an organic farming system. [5]

(c) Explain how to store and use different types of farm chemical to ensure safety on a farm. [6]

[Total: 15]

12 **(a)** Describe why a farmer might prefer to grow crops in a clay soil rather than in a sandy soil. [4]

(b) Nitrogen in the air is unavailable to plants. Describe how nitrogen can be supplied to plants by farmers. [6]

(c) Explain how plants take in mineral nutrients. [5]

[Total: 15]

13 **(a)** Describe **three** sources of water. [3]

(b) Explain how water can be supplied to animals in farm buildings one kilometre away from the water source. [6]

(c) Suggest how an adequate supply of clean water can help maintain good health in animals. [6]

[Total: 15]

14 **(a)** Describe **four** features of housing suitable for large livestock. [4]

(b) Explain the possible benefits of zero grazing. [5]

(c) State **three** records that should be kept as part of good stockmanship. Suggest why each record is important. [6]

[Total: 15]

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