Cambridge
O Level

Cambridge International Examinations
Cambridge Ordinary Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

4445261083

AGRICULTURE **5038/12**

Paper 1 **October/November 2016**

1 hour 45 minutes

Additional Materials: Answer Booklet/Paper

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen.
You may use an HB pencil for any diagrams or graphs.
Do not use staples, paper clips, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Section A
Answer **all** questions.
Electronic calculators may be used.
Write your answers in the spaces provided on the Question Paper.
You are advised to spend no longer than 1 hour on Section A.

Section B
Answer any **two** questions.
Write your answers on the Answer Booklet/Paper provided.
Enter the numbers of the Section B questions you have answered in the grid.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

For Examiner's Use	
Section A	
1	
2	
3	
4	
5	
6	
7	
8	
Section B	
Total	

This document consists of **16** printed pages.

CAMBRIDGE International Examinations

Section A

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

1 **(a)** Why do weeds reduce the yield of crops?

A their seeds ripen before the crop

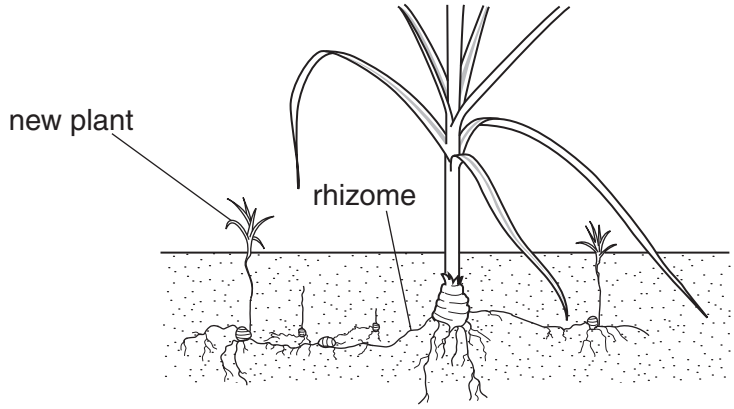
B they compete for available nutrients

C they spread by asexual methods

D they spread by seeds

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

(b) The diagram shows a weed with a rhizome.



Techniques **A** to **D** are possible methods to control this weed.

Which method would be the most effective?

A burning

B hand weeding

C hoeing

D systemic herbicide

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

(c) (i) Define the term *transpiration*.

.....

.....[1]

(ii) Explain how weather affects transpiration.

.....

.....

.....

.....[2]

[Total: 5]

2 **(a)** Name a cereal crop and a product obtained from this crop.

crop .....

product .....
[1]

(b) **(i)** Describe how land that has been fallow for a year could be prepared to sow the crop named in part **(a)**.

.....

.....

.....

.....

.....

.....[3]

(ii) List **three** ways the health of this crop could be maintained.

.....

.....

.....[3]

(iii) State how a farmer knows that this crop is ready to harvest.

.....

.....[1]

(iv) State an appropriate method of harvesting for this crop and explain why this method is suitable.

.....

.....

.....

.....[2]

(c) Explain why harvested crops should be stored in dry, cool and dark conditions.

.....

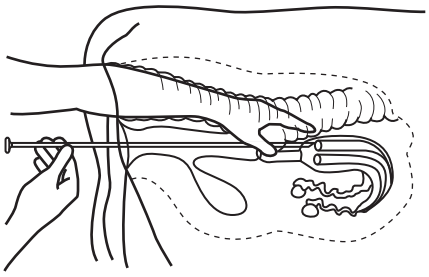
.....

.....

.....[2]

[Total: 12]

3 This diagram shows a cow being artificially inseminated.



(a) Identify a benefit of artificial insemination in cattle compared with natural servicing.

A a bull is not needed to produce the sperm

B can be done at any time

C desired characteristics will be produced

D risk of injury to the cow is reduced

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

(b) The following records are kept for a dairy herd. Some of the cows do not become pregnant following the first insemination and are re-inseminated. This may need to be done several times.

insemination	number of cows inseminated	pregnancies
first	40	24
second	16	10
third	6	4
fourth	2	1

(i) Calculate the percentage of successful first inseminations.

Show your working.

.....% [2]

(ii) Suggest why some of the cows failed to become pregnant.

.....

.....[1]

(iii) Poor pregnancy rates can affect a farm business.

Explain how.

.....

.....

.....

.....

.....

.....[3]

(iv) Suggest ways of improving pregnancy rates in ruminants.

.....

.....

.....

.....[2]

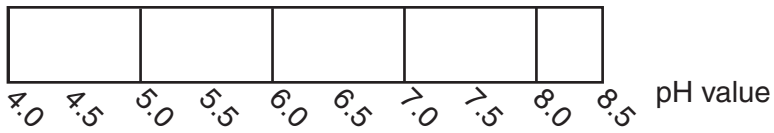
(v) State **two** additional records relating to breeding that farmers could use to improve the productivity of their herd.

.....

.....[2]

[Total: 11]

4 **(a)** The diagram shows some details of a chart used for measuring the pH of soil.



(i) Which pH value indicates an acidic soil?

A 6.0

B 7.0

C 7.5

D 8.0

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

(ii) State how the pH of the soil could be increased.

.....

.....[1]

(b) **(i)** The table describes part of a crop rotation.

Complete the table.

year	1	2	3	4
crop type	legume	.....	root crop	fallow
example	.....	maize	.....	no crop

[3]

(ii) Explain how this rotation helps to maintain soil fertility.

.....

.....

.....

.....

.....

.....[3]

[Total: 8]

5 **(a)** The diagram shows two varieties of a bean plant. One is a dwarf variety and the other is a variety with plant stems of normal height.

dwarf normal

(i) A plant breeder crosses plants with the genotypes Dd and dd. The allele for dwarfism, D, is dominant.

Show which genotypes would be present in the offspring.

parents

gametes

offspring

[3]

(ii) State the phenotype of the heterozygous plant.

.....[1]

(iii) What would be the expected percentage of normal plants within the offspring?

A 25%

B 50%

C 75%

D 100%

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

(b) Describe how a new dwarf variety of bean could be produced by selective breeding.

.....

.....

.....

.....[2]

(c) Suggest **two** reasons why farmers might prefer to grow dwarf crops.

.....

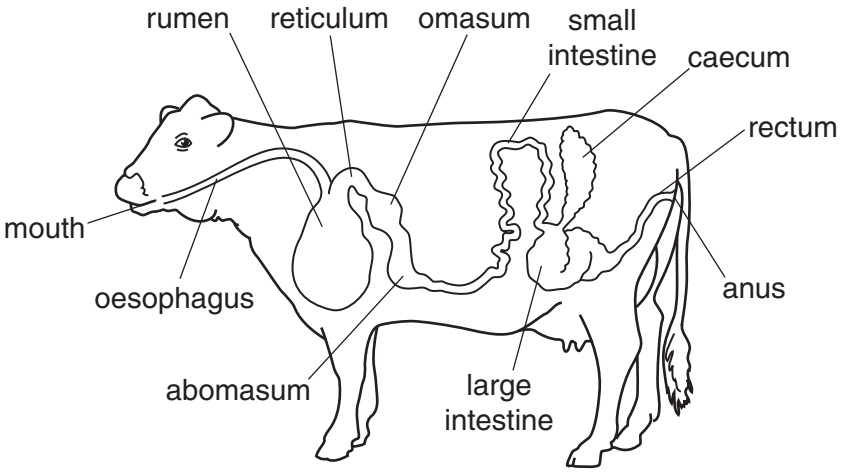
.....

.....

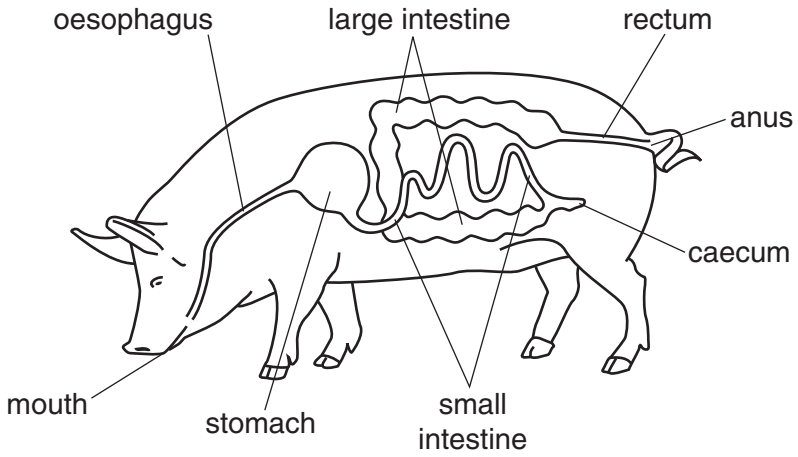
.....[2]

[Total: 9]

6 The diagram shows the digestive systems of a ruminant (cow) and non-ruminant (pig).



ruminant (cow)



non-ruminant (pig)

(a) Identify **three** differences between the digestive systems of ruminant and non-ruminant animals.

.....

.....

.....

.....

.....

.....[3]

(b) **(i)** Mark with an **X** on the diagram the **label** where most protein and fat is absorbed in the ruminant (cow). [1]

(ii) Mark with a **Y** on the diagram the **label** where most water is absorbed in the non-ruminant (pig). [1]

(c) State what happens to undigested material in ruminants.

.....

.....[1]

(d) What is the function of fibre in non-ruminants?

.....

.....[1]

(e) Explain why the process of digestion in ruminants can harm the environment.

.....

.....

.....

.....[2]

(f) Suggest how the process of digestion in ruminants is more efficient in the use of resources than in non-ruminants.

.....

.....

.....

.....[2]

[Total: 11]

7 **(a)** Which of the following nutrients is available from a fertiliser labelled 20:10:10?

A calcium

B magnesium

C phosphorus

D sulfur

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

(b) **(i)** Describe **one** observation that a crop is suffering from a deficiency of the following major nutrients.

nitrogen

observation .....

.....

potassium

observation .....

.....
[2]

(ii) State **two** ways in which the nitrate content of a soil can be increased in an organic farming system.

.....

.....

.....[2]

(c) **(i)** Name **one** fertiliser that is a good source of phosphorus.

.....[1]

(ii) Name **one** fertiliser that is a good source of potassium.

.....[1]

(d) What is meant by the term *compound fertiliser*?

.....[1]

[Total: 8]

8 The picture shows a crop being sprayed with herbicide.

(a) State **two** precautions that should be taken when spraying with herbicide and give a reason for each precaution.

precaution .....

.....

reason .....

.....

precaution .....

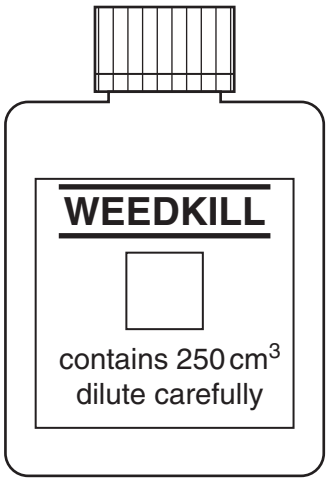
.....

reason .....

.....

[4]

(b) The diagram shows a bottle of pesticide called WEEDKILL. The dilution rate for WEEDKILL is 25 cm^3 in 1 litre of water.



What volume of diluted spray can be made using all the WEEDKILL? Include a unit in your answer.

Show your working.

volume = ...[2]

[Total: 6]

[Turn over

Section B

Answer any **two** questions.

Write your answers on the separate paper provided.

9 **(a)** Describe the different properties of clay and sandy soils. [5]

(b) Explain the role of the nitrogen cycle in maintaining soil fertility. [7]

(c) Explain how extremes of temperature can affect the rate of plant growth. [3]

10 **(a)** State what is meant by the term *production ration*. [3]

(b) Describe suitable housing for a **named** farm animal. [7]

(c) Explain the different ways in which diseases can spread through animals kept in housing. [5]

11 **(a)** Describe what is meant by the term *intensive grazing*. [3]

(b) Explain how the stocking rate of a pasture can be increased without causing overgrazing. [7]

(c) Explain the advantages of zero grazing. [5]

12 **(a)** State what is meant by the term *osmosis*. [3]

(b) Describe the ways in which plants absorb nutrients from the soil. [6]

(c) Explain the different ways in which the nutrient availability of soils can be improved. [6]

13 **(a)** State the name of a biting and chewing crop pest and explain how this pest damages a crop. [4]

(b) Describe the methods which could be used to control this pest. [6]

(c) Explain the factors a farmer may need to consider when deciding how to control this pest. [5]