UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

AGRICULTURE **5038/12**

Paper 1 **October/November 2013**

1 hour 45 minutes

Candidates answer Section A on the Question Paper.

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 a pencil for any diagrams or graphs.
Do not use staples, paper clips, highlighters, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Section A
Answer **all** questions.
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 below.

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	
Section B	
Total	

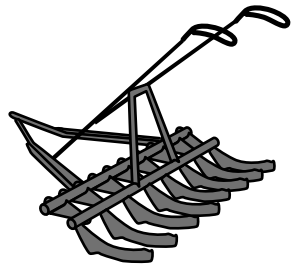
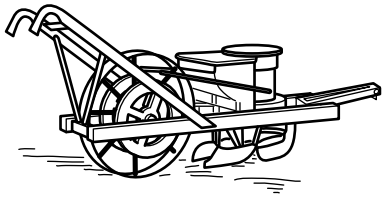
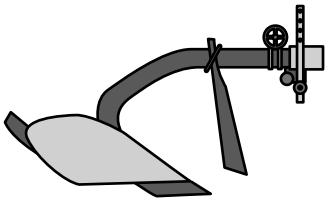
This document consists of **22** printed pages and **2** blank pages.

Section A

For Examiner's Use

Answer **all** the questions.

1 **(a)** Below are some farm implements.

	....
	....
	....

State the function of each in the box provided. [3]

(b) **(i)** Why should hand tools be oiled after use?

A to make cleaning unnecessary

B to make rusting less likely

C to make them more slippery

D to make them sharper

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

(ii) Many hand tools have wooden handles.

Suggest two ways in which wooden handles could be damaged.

For Examiner's Use

1 .....

.....

2 .....

.....[2]

[Total: 6]

2 **(a)** Fig. 2.1 shows three hand tools used to construct a house for small livestock.

For Examiner's Use

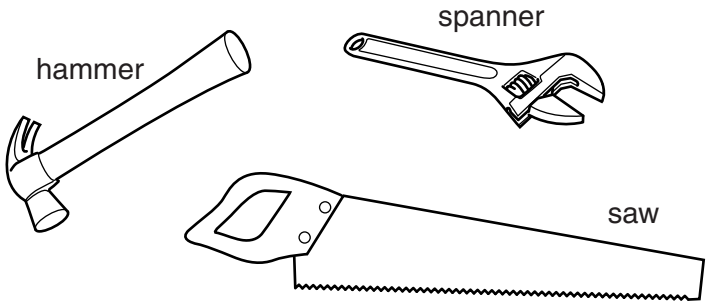


Fig. 2.1

Fig. 2.2 shows two farm buildings.

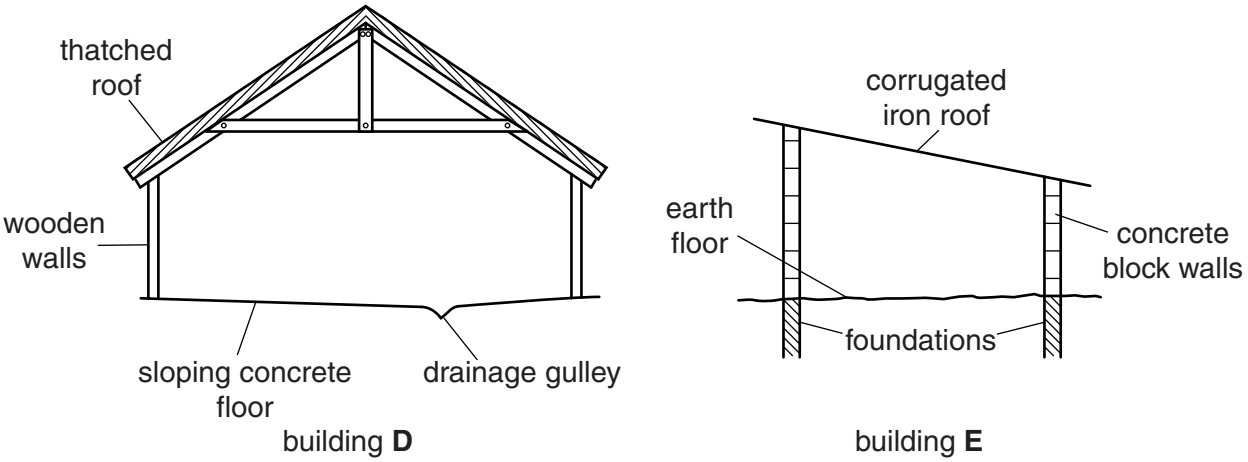


Fig. 2.2

State how each tool in Fig. 2.1 is used in the construction of building **D** in Fig. 2.2.

hammer.....

saw .....

spanner ..... [3]

(b) State and explain which building shown in Fig. 2.2

For Examiner's Use

1 will stay cooler in very hot weather,

building .....

explanation .....

.....

2 would be the more durable (long-lasting).

building .....

explanation .....

.....

[4]

[Total: 7]

3 Fig. 3.1 shows a cross-section through a bean flower.

For Examiner's Use

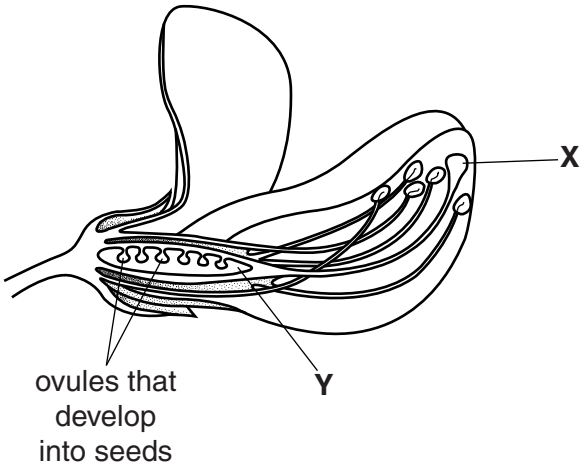


Fig. 3.1

(a) Name the parts labelled **X** and **Y**.

X .....

Y ..... [2]

(b) The ovules can develop into seeds that are mottled or black.
The seed colour is controlled by *genes*.

Which is the best definition of a *gene*?

A an allele

B a part of a chromosome

C an inherited feature

D an organism's DNA

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

(c) The seeds of a bean can be produced by self-fertilisation.

The allele for black seed colour (**B**) is dominant to the allele for mottled seed colour (**b**).

If a bean plant that is homozygous for the allele for black seed colour is self-fertilised, what will be the genotypes of the seeds produced?

A **bb** and **BB**

B **bb** and **Bb**

C all **Bb**

D all **BB**

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

(d) Explain the difference between the terms *homozygous* and *heterozygous*.

For Examiner's Use

.....

.....

.....[2]

(e) Fig. 3.2 shows part of a sweet potato plant.

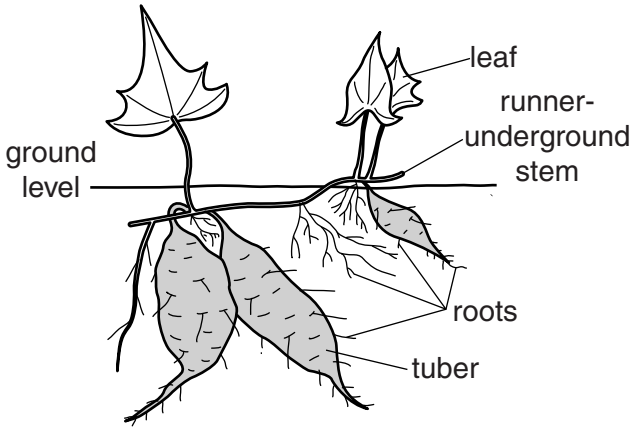


Fig. 3.2

New plants can be produced by planting pieces of runner.

(i) What is the name given to this type of reproduction?

.....[1]

(ii) If pieces of runner are planted in different garden plots the phenotypes can vary. Suggest why.

.....

.....[1]

[Total: 8]

4 Fig. 4.1 shows the digestive system of a rabbit.

For Examiner's Use

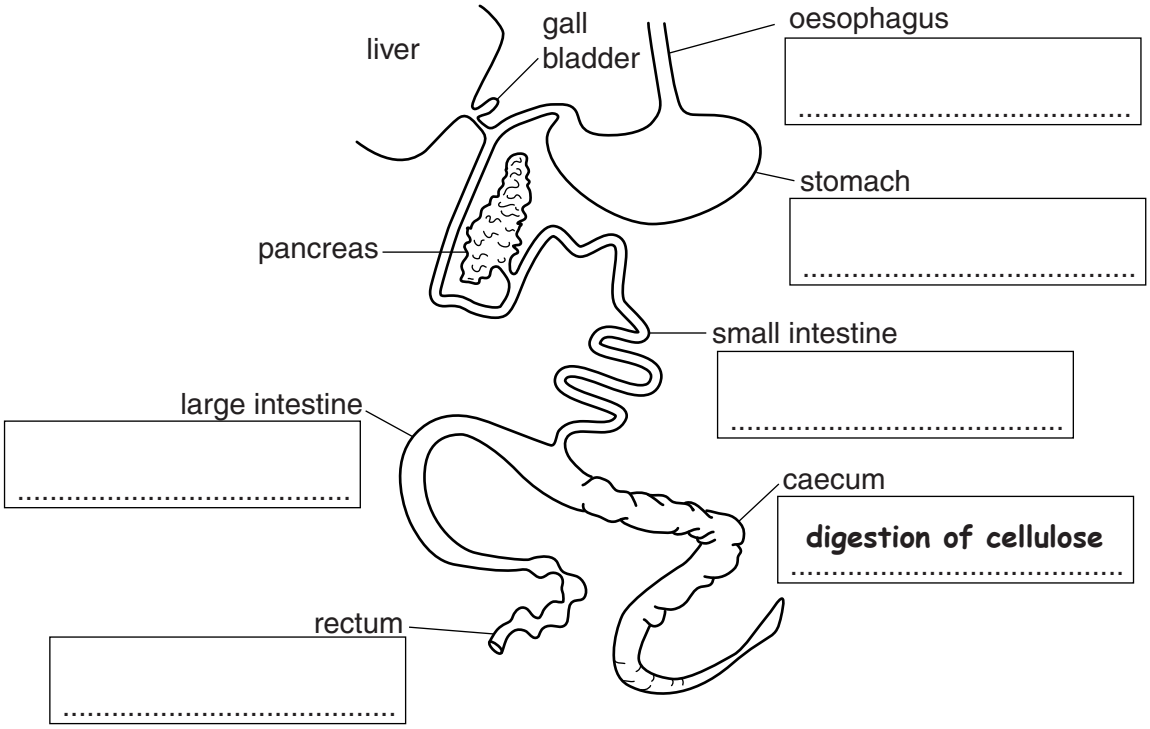


Fig. 4.1

(a) Two functions of the digestive system are

- **water absorption,**
- **digestion of fats**.

Write these functions in the correct boxes on Fig. 4.1. Some boxes will remain blank. [2]

(b) The digestion of cellulose occurs in the caecum, aided by microorganisms.

What is this process called?

A aerobic respiration

B decomposition

C fermentation

D metabolism

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

(c) Nutrients in an animal's diet have various functions in the body.

Complete the table below by **writing in** the correct nutrient and function.

nutrient in food	function in body
protein	growth
.....	healthy teeth and bones, milk production
vitamin E	.....

[2]

(d) Table 4.1 shows the percentage of energy and protein in different foodstuffs.

Table 4.1

foodstuff	percentage energy content	percentage protein content
dry grass	5.2	4.0
fresh, green grass	8.1	12.0
maize meal	80.0	6.8
meat meal	91.0	67.0
sorghum meal	67.0	7.7
sunflower cake	54.0	34.0
wheat bran	42.0	11.0

(i) Name a bulk foodstuff in the table.

.....[1]

(ii) Which foodstuffs have a higher percentage of both energy and protein than fresh, green grass?

.....[1]

(iii) Which foodstuff would you recommend feeding for healthy, pregnant animals?

Give **two** reasons for your answer.

.....

.....

.....[2]

(e) Concentrates are animal feedstuffs that have a high food value in relation to their bulk.

Suggest why dry grass might be used rather than a concentrate food in zero grazing systems.

.....

.....[1]

[Total: 10]

5 **(a)** Fig. 5.1 shows the relationship between the average numbers of butterfly caterpillars feeding on plants and the loss in percentage yield of the crop.

For Examiner's Use

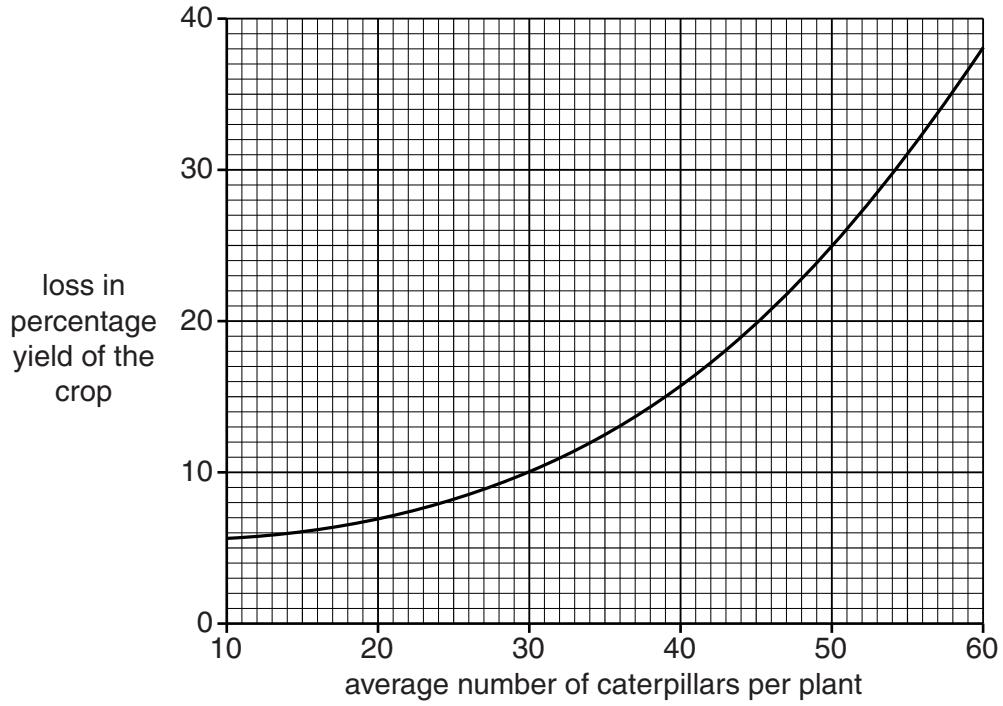


Fig. 5.1

(i) What is the loss in percentage yield when there is an average of 50 caterpillars per plant?

.....[1]

Fig. 5.2 shows a leaf that has been fed on by a caterpillar.

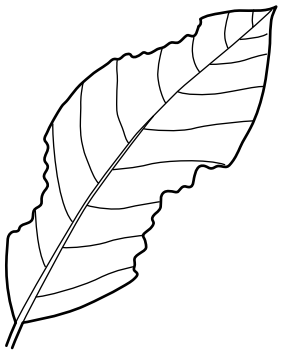


Fig. 5.2

(ii) Suggest how caterpillars damage a crop.

.....[1]

(iii) Explain two ways by which this damage reduces the yield of a crop.

1 .....

.....

2 .....

.....[2]

(b) Five pesticides were tested to find their effectiveness at protecting a crop from five pests.

The percentages of infested plants one week after treatment are shown in Table 5.1.

Table 5.1

	percentage of infested plants one week after treatment				
pesticide treatment	flea beetle	green aphid	blue–grey aphid	moth caterpillar	butterfly caterpillar
A	35	10	15	35	35
B	25	17	20	45	40
C	25	30	25	42	36
D	20	19	22	37	31
E	14	70	80	30	20
untreated	70	68	71	55	61

(i) Which pesticide treatment was most effective at reducing infestation by both moth and butterfly caterpillars?

answer **A**, **B**, **C, D** or **E** ..... [1]

(ii) Which pesticide treatment is most likely to have been systemic?

answer **A**, **B**, **C, D** or **E** ..... [1]

(iii) Suggest a reason why there was a greater infestation of the blue-grey aphid in the crop treated by pesticide **E** than in the untreated crop.

.....

.....[1]

[Turn over

(c) Fig. 5.3 is part of a label from a container of pesticide applied to a crop.

For Examiner's Use

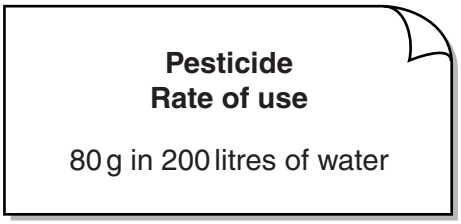


Fig. 5.3

(i) What mass of pesticide will be required to make enough solution to fill a 10 litre knapsack sprayer?

A 0.2 g

B 0.4 g

C 2.0 g

D 4.0 g

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

(ii) Spraying should not be carried out on a windy day.

State two reasons why.

1 .....

.....

2 .....

.....[2]

[Total: 10]

QUESTION 6 STARTS ON PAGE 14

6 **(a)** A farmer wishes to find out the pH of soil in a pasture.

Fig. 6.1 shows the way 12 test samples are collected.

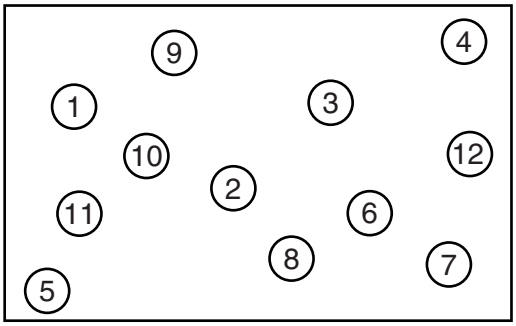


Fig. 6.1

(i) Why are the samples collected in this way?

.....

.....[1]

The samples are placed in test-tubes with distilled (deionised) water.

(ii) Explain why distilled water is used rather than water from a stream.

.....

.....[1]

The samples are shaken and left to settle.
Fig. 6.2 shows a soil pH meter that can be used to find out the pH value of a sample.

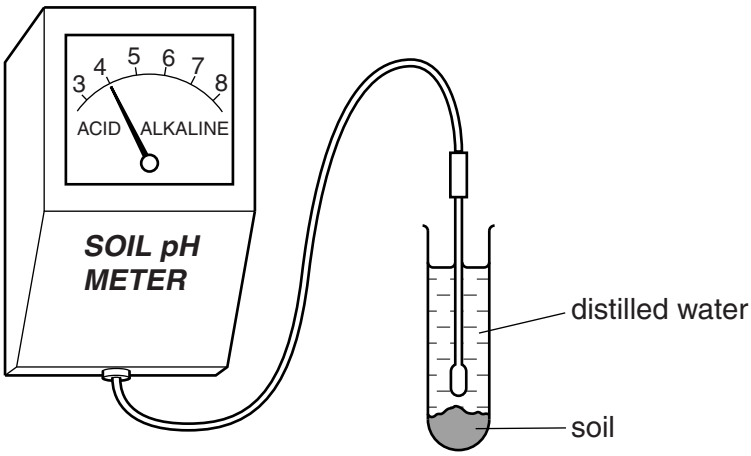


Fig. 6.2

The sample tested gave a pH of 4.

(iii) What colour would soil pH indicator give if added to the test-tube?

.....[1]

(b) State two ways in which this pasture would benefit from liming.

For Examiner's Use

1 .....

.....

2 .....

.....[2]

(c) In the pasture called veld there is continuous competition between grass plants and woody bushes.
Without farming activity, bushes spread and dominate the grassland.

Fig. 6.3 shows the effects, on the spread of bushes, of annual burning and of grazing by goats.

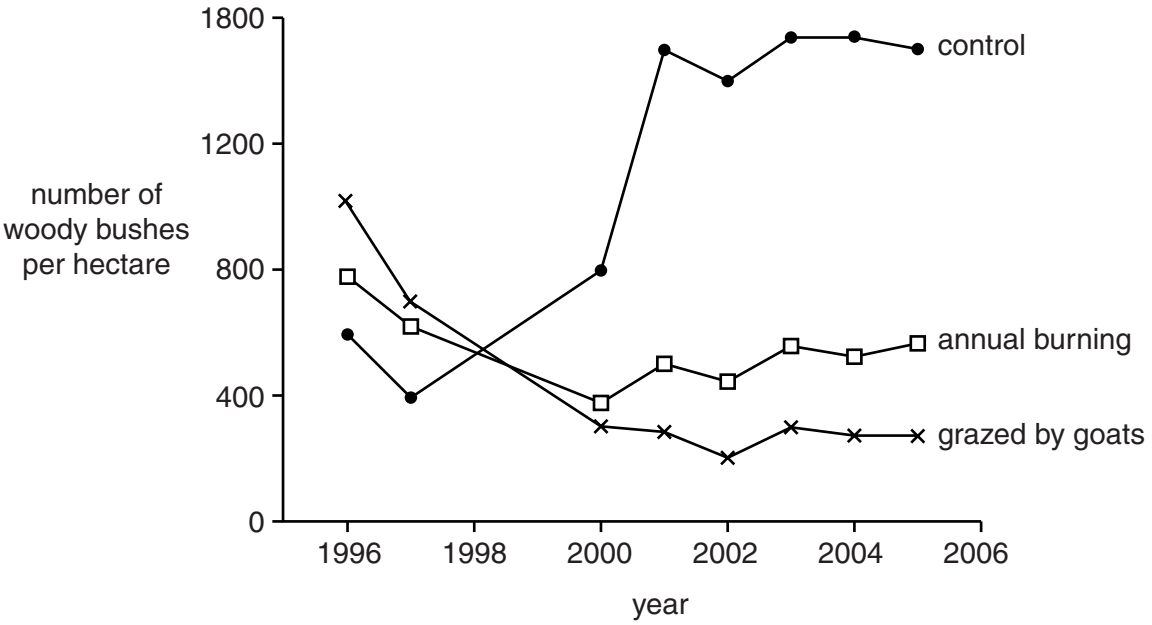


Fig. 6.3

(i) State **one** conclusion that can be made about the number of bushes per hectare between 1996 and 2005.

.....

.....[1]

(ii) Suggest reasons to explain the difference between the number of bushes that resulted after annual burning and goat grazing.

.....

.....

.....[2]

[Total: 8]

7 **(a)** What two conditions are essential for seed germination?

A carbon dioxide and oxygen

B chlorophyll and light

C soil particles and mineral salts

D water and a warm temperature

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

(b) Fig. 7.1 shows a germinating bean.

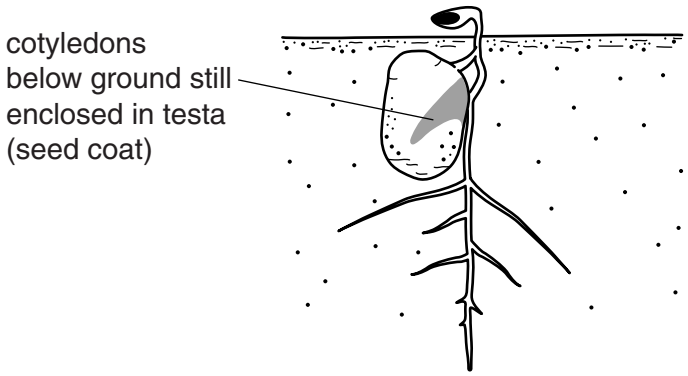


Fig. 7.1

(i) Label the plumule on Fig. 7.1 by putting a label line and the label, **plumule**, on Fig. 7.1. [1]

(ii) State the function of the cotyledons.

.....[1]

(c) The germination of bean seeds depends on the depth they are planted.
Table 7.1 shows the percentage of bean seeds that germinate successfully at different depths.

Table 7.1

depth of planting/cm	1	6	12	18
percentage germination	50	95	80	30

Suggest a reason for the lower percentage germination at

1 cm planting depth, ...

.....

18 cm planting depth. .....

.....[2]

(d) Fig. 7.2 compares the germination of a broad bean and a French bean.

For Examiner's Use

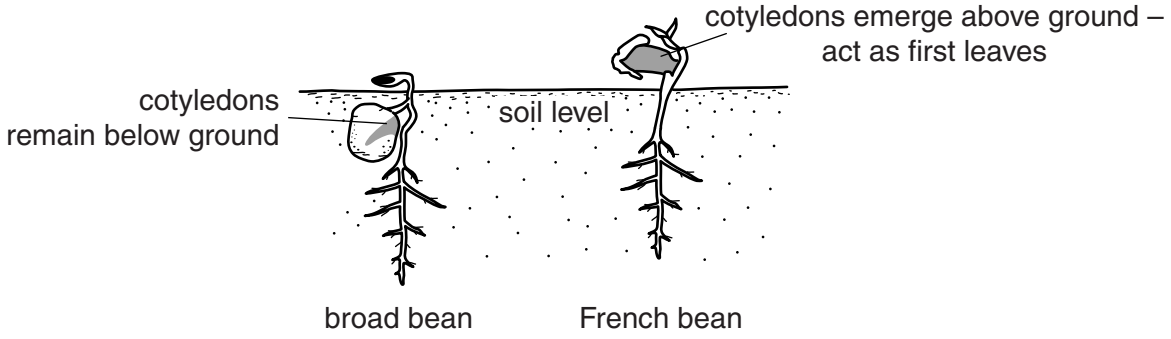


Fig. 7.2

A student stated that the broad bean seed had the more successful method of germination.

Suggest one piece of evidence, visible in Fig. 7.2, that the student might have used to justify this statement.

.....

.....[1]

[Total: 6]

8 Control of disease in livestock requires good hygiene management.

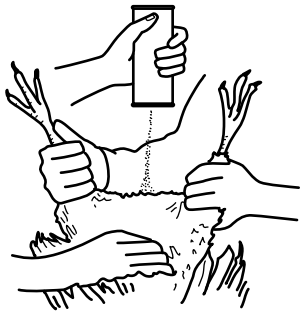
(a) Which building is easiest to clean and disinfect?

building	wall construction	roof construction	floor construction
A	brick	corrugated iron	earth
B	wood	thatch	earth
C	brick	corrugated iron	concrete
D	wood	thatch	concrete

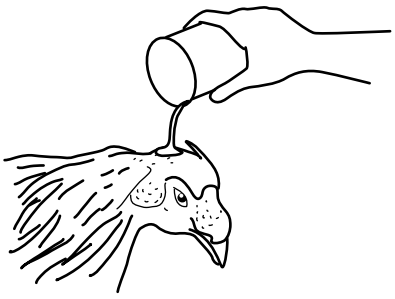
Answer **A**, **B**, **C** or **D** ..... [1]

(b) Birds can be infected by external parasites such as lice and mites.
These are controlled using a pesticide.
The diagrams show four ways of applying the pesticide.
Which is the **least** effective method?

A bathing



B dusting



C pouring on

D spraying

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

(c) State **three** signs of ill-health in a named type of farm livestock.

For Examiner's Use

type of livestock ……

signs of ill-health

1 .....

2 .....

3 .....

[3]

(d) **(i)** What is meant by the term, *notifiable (scheduled) disease*?

.....

.....[1]

(ii) Give **one** example of a notifiable disease.

.....[1]

[Total: 7]

9 **(a)** What is the name given to the growing of the same crop in the same field over a period of years?

A arable culture

B intercropping

C monoculture

D organic cultivation

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

(b) **(i)** Fig. 9.1 shows four sacks of inorganic fertiliser.

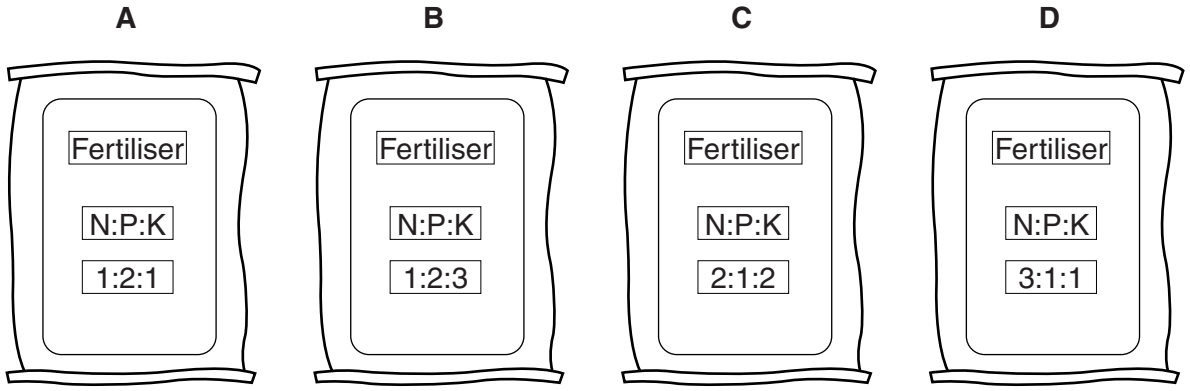


Fig. 9.1

Which sack of fertiliser would be best for applying to a leafy crop?

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

(ii) State two advantages of using inorganic fertiliser rather than organic fertiliser.

1 .....

.....

2 .....

.....[2]

(c) Fig. 9.2 shows a poultry house built over a pond.

It has a wire floor and the poultry droppings fall into the pond.

For Examiner's Use

Fig. 9.2

The pond is used for fish farming.

(i) State **one** advantage of this farming system to

the farmer, ...

.....

the poultry, ...

.....

the fish. .....

.....[3]

(ii) Suggest a possible problem that might arise from using this farming system.

.....

.....[1]

[Total: 8]

Section B

Answer any **two** questions.

Write your answers on the separate paper provided.

10 **(a)** For a named crop, describe the harvesting methods and storage requirements. [4]

(b) For the crop that you have named in **(a)**

(i) state the name of an **insect** pest that affects this crop, [1]

(ii) describe the damage caused by this pest, [3]

(iii) state and explain the methods that can be used for prevention and control of this insect. [7]

11 **(a)** For a named livestock enterprise, outline the records that should be kept. [7]

(b) Describe and explain the factors that a farmer should consider when deciding on a livestock enterprise for a farm. [8]

12 **(a)** Describe and explain what is meant by the *nitrogen cycle*. [8]

You may use a diagram to explain your answer.

(b) **(i)** State what is meant by the term *crop rotation*. [1]

(ii) Describe a crop rotation plan that would be suitable for a small-scale farm. [3]

(iii) Outline the advantages of crop rotation. [3]

13 **(a)** Describe the function of xylem tissue in a plant. [3]

(b) **(i)** Describe the process of transpiration. [9]

(ii) Explain the importance of transpiration to a plant. [3]

14 **(a)** Describe the ways in which soil erosion is brought about. [8]

(b) Describe and explain agricultural practices that can help to reduce soil erosion. [7]

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