UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

CANDIDATE NAME

CENTRE NUMBER | | | | | |

CANDIDATE NUMBER | | | | |

AGRICULTURE **5038/11**

Paper 1 **October/November 2012**

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 soft 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	

Section A

Answer **all** the questions.

1 **(a)** Fig. 1.1 shows the result of shaking a sample of soil with water and then allowing it to settle.

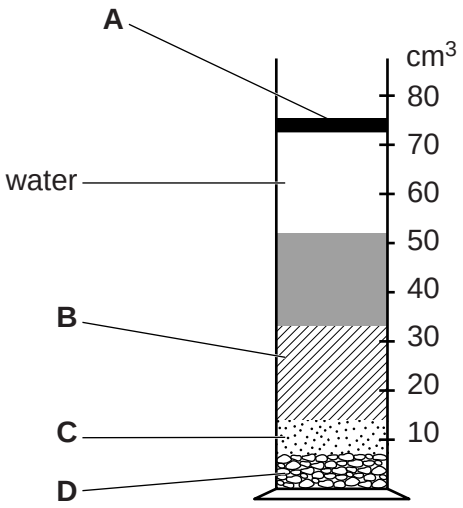

Fig. 1.1

Choose words from the list below to identify layers **A**, **B**, **C** and **D**.

clay **gravel** **humus** **sand** **silt**

A .....

B .....

C .....

D ..... [3]

(b) Use lines to join each soil constituent to its role in the soil.

The first one has been done for you.

soil constituent	role in soil
air	dissolving nutrients
humus	breaking down organic material
microorganisms	plant root respiration
water	improving soil structure and adding nutrients

[2]

(c) Many crops grow better if the pH of an acid soil is increased by spreading lime. Suggest **one** reason for this.

.....

..... [1]

[Total: 6]

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2 **(a)** Fig. 2.1 shows three hand tools used in preparing a seed bed in a garden plot.

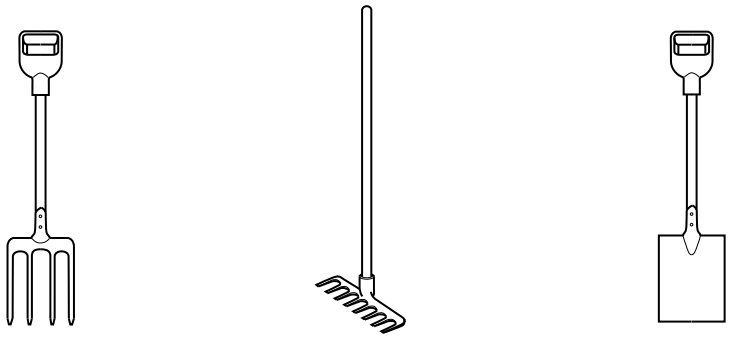


Fig. 2.1

State the order in which the tools should be used to produce a fine tilth.

1st tool used .....

2nd tool used .....

3rd tool used ..... [1]

(b) Complete the table below for a crop that is **grown locally**.

name of crop	
type of fertiliser applied	
timing of applying this fertiliser	
signs that the crop is ready for harvest	

[3]

(c) Maize is a cereal crop grown in many parts of the world. Outline the process of sexual reproduction in maize.

.....

.....

.....

..... [3]

[Total: 7]

3 **(a)** Fig. 3.1 shows part of the nitrogen cycle.

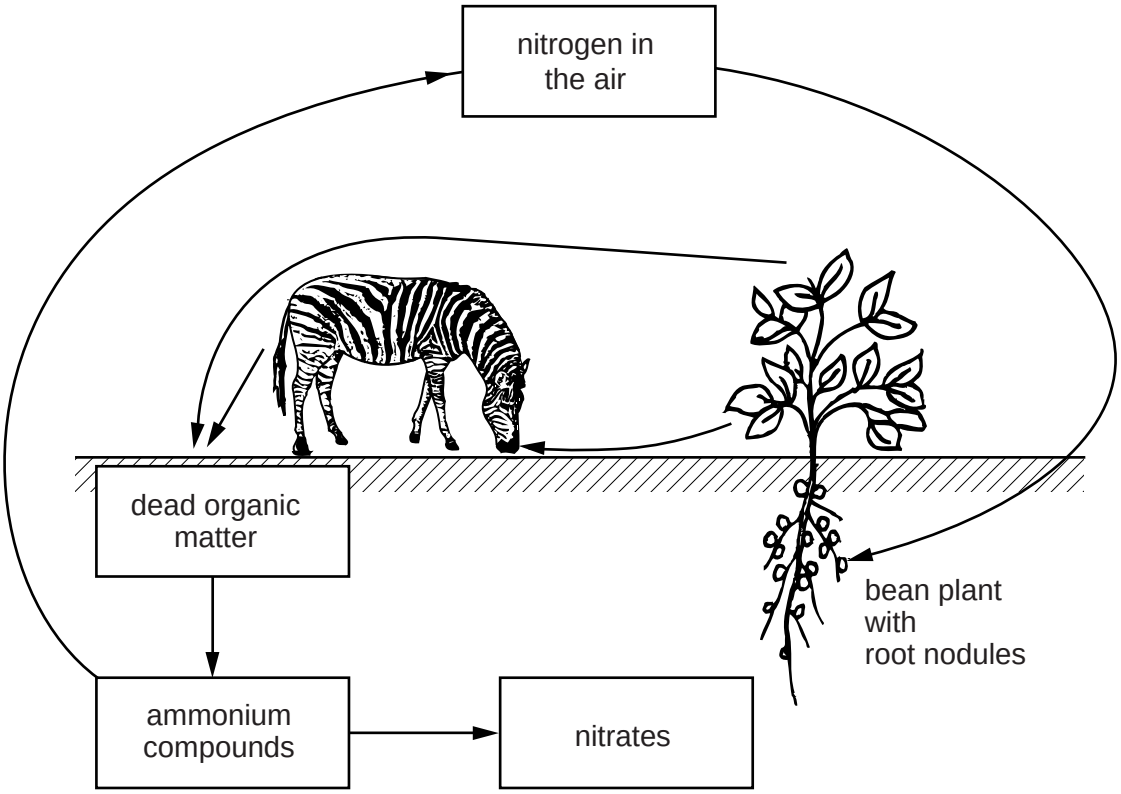


Fig. 3.1

On Fig. 3.1, write the letter:

- **D** to show where denitrification occurs;
- **P** to show where decomposition occurs;
- **N** to show where nitrifying bacteria are working.

[3]

(b) Fig. 3.2 shows part of a three-year crop rotation plan.

	year 1	year 2	year 3
field **A**	legumes	cereals	
field **B**	cereals	root crops	
field **C**	root crops	legumes	

Fig. 3.2

(i) On Fig. 3.2, complete the rotation pattern for year 3. [1]

(ii) Explain why legumes are important in a crop rotation.

.....

.....

..... [2]

(iii) State **one** benefit of crop rotation.

.....

..... [1]

[Total: 7]

4 **(a)** Here is the definition of a biological process:

The diffusion of water molecules from a region of high water potential to a region of lo water potential through a partially permeable membrane.

Which process does this define?

Put a ring ◯ around the correct answer from the following list:

active transport **osmosis** **photosynthesis** **translocation**

[1]

(b) Fig. 4.1 shows a section through the leaf of a plant.

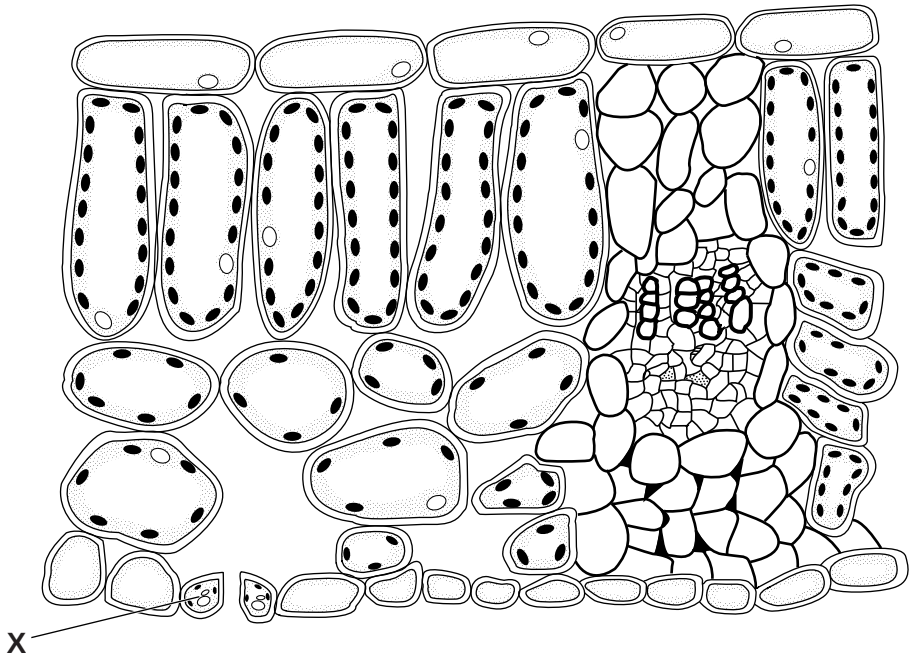


Fig. 4.1

(i) On Fig. 4.1, label

- the palisade layer,
- the phloem. [2]

(ii) Give the name of cell **X**.

..... [1]

(c) Outline the process of transpiration in a plant.

.....

.....

.....

..... [3]

(d) Some plants survive in very windy areas. Suggest **one** way in which leaves may be adapted to help the plant survive these conditions.

.....

..... [1]

[Total: 8]

5 **(a)** Flies can be vectors (carriers) of disease-causing organisms.

In animal housing, what will help to prevent the spread of diseases by flies?

A covering all stores of food

B an open water supply

C good ventilation

D separation of old and young stock

answer = ... [1]

(b) Which type of disease is spread by an infected animal touching a healthy one?

A air-borne

B contagious

C deficiency

D water-borne

answer = ... [1]

(c) **(i)** State **two** signs that should be looked for when checking animals for disease.

1 .....

2 ..... [2]

(ii) State **two** actions that should be taken when disease is suspected.

1 .....

2 ..... [2]

(d) (i) Fig. 5.1 shows:

- chicks being brooded (taken care of) naturally with a mother hen;
- chicks in an artificial brooder.

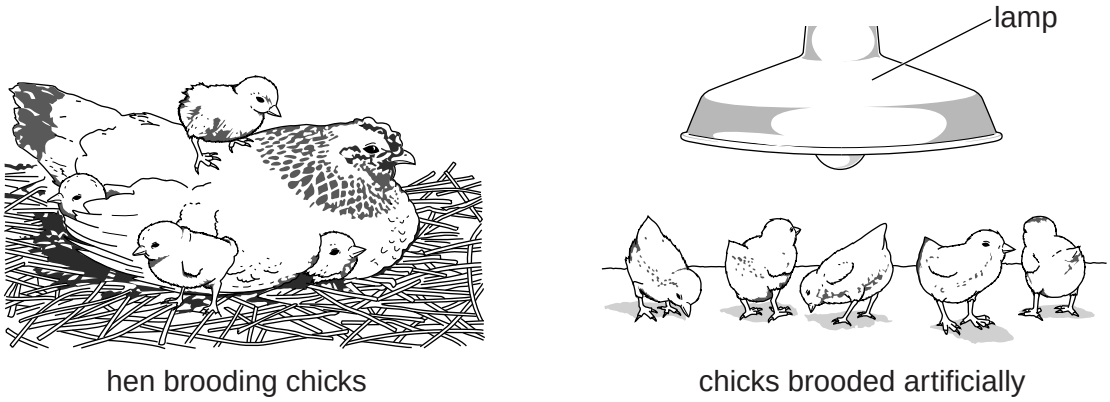


Fig. 5.1

Suggest and explain why the chicks in the artificial brooder are under a lamp.

.....

.....

..... [2]

(ii) Fig. 5.2 shows a chick being vaccinated.

Fig. 5.2

Explain why young animals may be vaccinated.

.....

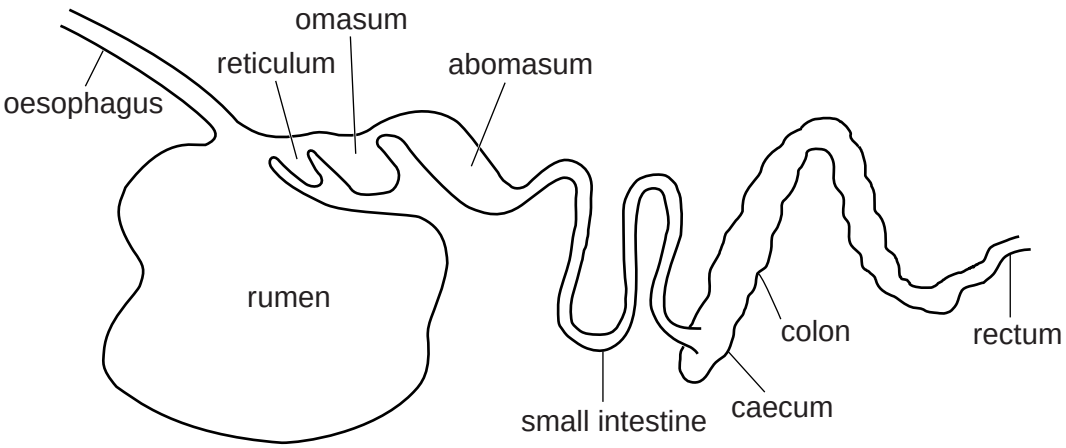
.....

..... [2]

[Total: 10]

6 Fig. 6.1 shows the digestive systems of a ruminant and of a non-ruminant (pig).

RUMINANT



NON-RUMINANT (pig)

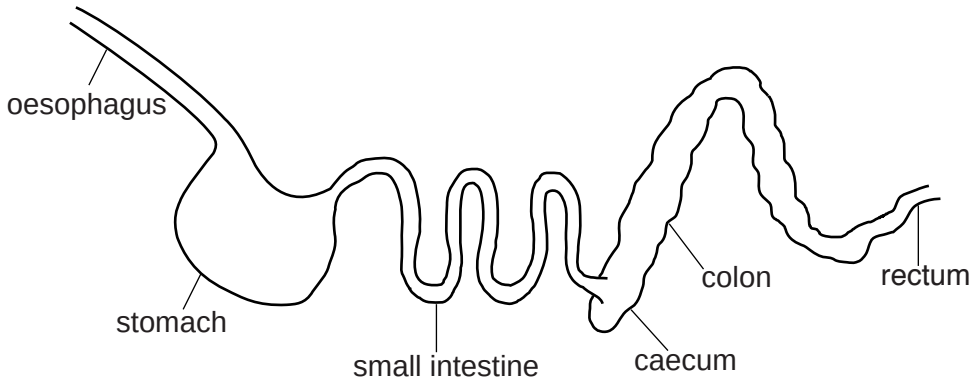


Fig. 6.1

(a) In the ruminant digestive system:

(i) name the part where most bacterial fermentation occurs;

..... [1]

(ii) state the purpose of bacterial fermentation;

.....

..... [1]

(iii) name the part in which protein digestion begins.

..... [1]

(b) **(i)** State **two** similarities in the structure of the ruminant and non-ruminant digestive systems.

1 .....

2 ..... [2]

(ii) State **one** difference in the structure of the ruminant and non-ruminant digestive systems.

..... [1]

(c) Farming practices release gases that contribute to 'global warming'.

Fig. 6.2 shows a pie chart comparing the amounts of these gases released by different farming practices.

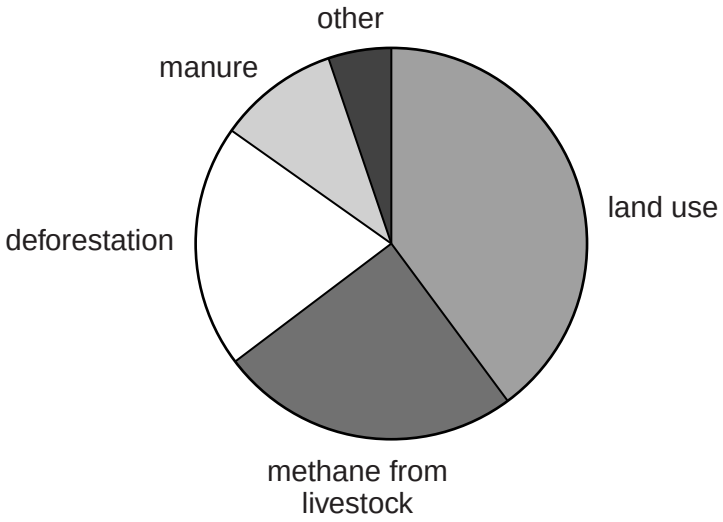


Fig. 6.2

Which farming practice produces 20% of the total gases released?

..... [1]

(d) Methane is a gas released by livestock, as a result of digestive processes. Fig. 6.3 is a bar chart that compares the amount of methane released by different types of livestock.

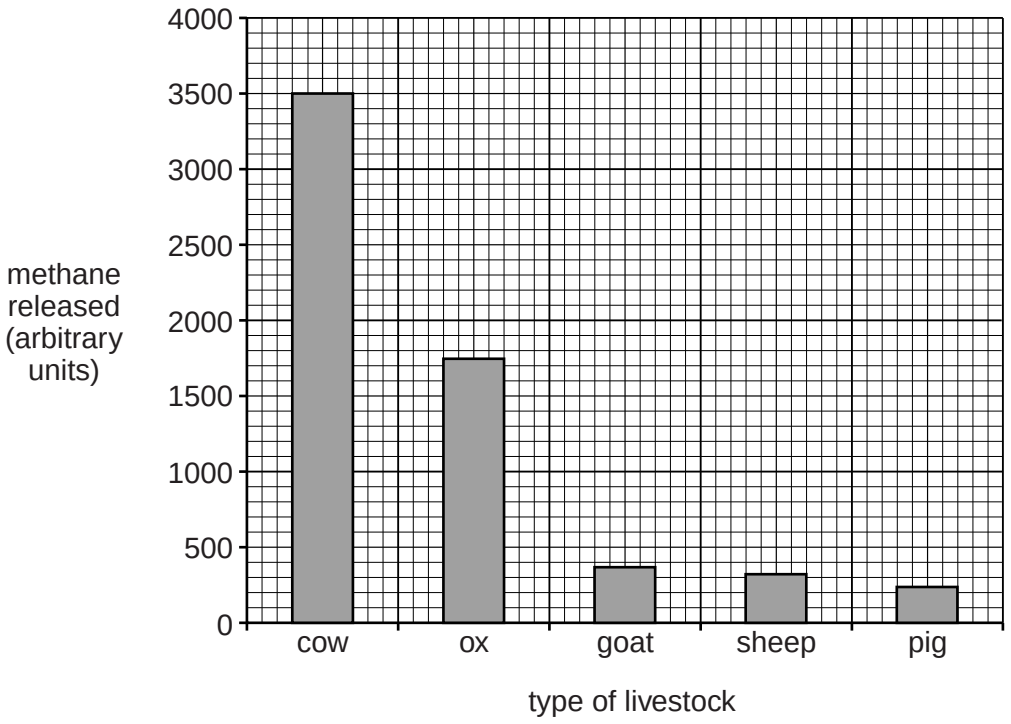


Fig. 6.3

(i) Approximately how much more methane is released by a cow than by a goat?

A about four times more

B about seven times more

C about nine times more

D about twelve times more

answer = ... [1]

(ii) Sheep and goats release more methane than pigs, although pigs are larger than either sheep or goats. Suggest a reason for this.

.....

..... [1]

[Total: 9]

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7 **(a)** What increases demand for a product?

A increase in population

B increase in price

C increase in similar products

D increase in supply

answer = ... [1]

(b) Table 7.1 shows some of the financial records for a mixed farm.

Table 7.1

enterprise	expenditure ($)		receipts ($)		gross margin ($)
cattle	replacing animals	210.00	meat	175.00	
	feed	15.00	milk	350.00	
	medicine	90.00			
		315.00		525.00	210.00
poultry	replacing animals	87.00	eggs	171.00	
	feed	60.00			
	medicine	6.00			
		153.00		171.00	18.00
arable	seeds	50.00	cabbages	112.00	
	fertiliser	25.00	beans	100.00	
		75.00		212.00	137.00

(i) Which enterprise shows the gross margin as the greatest percentage (%) of expenditure?

..... [1]

Forecasts predict:

- the cost of animal feeds will rise;
- the demand for vegetables and eggs will rise.

(ii) Suggest which enterprise the farmer should increase and give a reason for your choice.

enterprise .....

(iii) Suggest which enterprise the farmer should reduce and give a reason for your choice.

enterprise .....

reason ..... [1]

(iv) Give **one other** cost which has not been shown in the records but which should be taken into account when comparing the enterprises.

..... [1]

[Total: 5]

8 **(a)** Draw a line from each of the terms below to its correct definition.

The first one has been done for you.

term	definition
allele	the observable characteristics of an individual
chromosome	reproductive cell that fuses with another in fertilisation
gamete	an alternative form of a gene
phenotype	structure in the nucleus of a cell carrying genetic information

[2]

(b) Fig. 8.1 shows the result of crossing two homozygous (pure-breeding) varieties of rabbit.

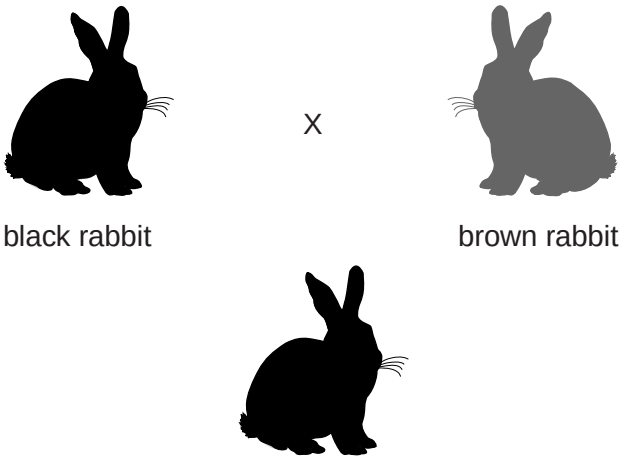

Fig. 8.1

(i) State why all the offspring are black.

..... [1]

(ii) The offspring were allowed to mate with each other. Some of the resulting were brown and some were black. What percentage (%) of these rabbits would expected to be brown?

Draw a diagram to show how you reached your answer.

brown rabbits .....% [3]

(c) A study was carried out to investigate the food intake and growth of rabbits from [illegible] eight weeks old.

The results are shown in Table 8.1.

Table 8.1

	weekly food intake		body weight	
age (weeks)	doe (mother) and all young in litter (kg)	young rabbit (g)	total mass of all young rabbits in litter (kg)	average mass of an individual young rabbit (g)
1	1.91		0.45	56.7
2	2.29		1.09	136.2
3	2.31		1.91	239.0
4	3.10	313	4.40	550.0
5	5.24	417	7.08	885.0
6	7.00	378	9.80	1226.0
7	8.02	428	12.35	1544.0
8	9.31	467	15.61	1952.2

Use the information from Table 8.1 to answer the following questions.

(i) How many rabbits were in the litter?

Show your working.

number of rabbits in litter ..... [2]

(ii) There are no figures for food intake by young rabbits in weeks 1–3. Explain the reason for this.

.....

..... [1]

(d) Fig. 8.2 shows how the weekly food intake of each young rabbit compares w... weight gain of each rabbit.

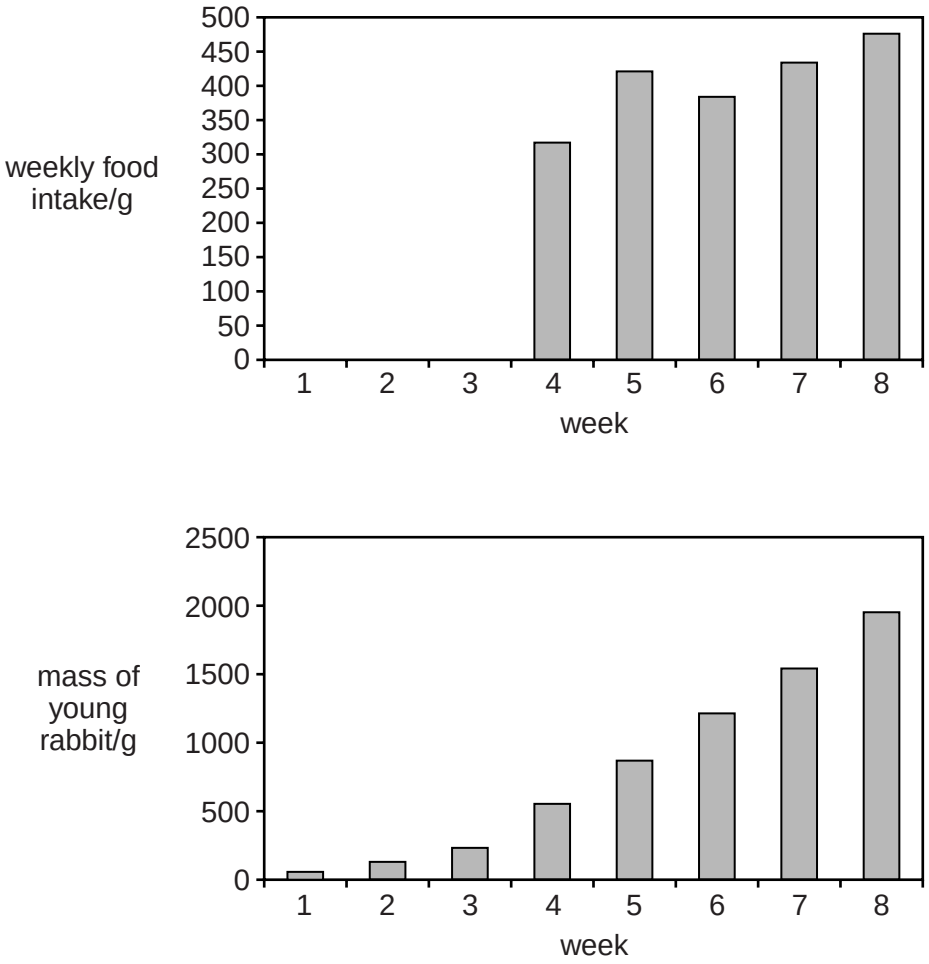

Fig. 8.2

Compare the changes in body mass with the amount of food taken in.

.....

.....

.....

..... [2]

[Total: 11]

9 Fig. 9.1 shows a house used for small livestock.

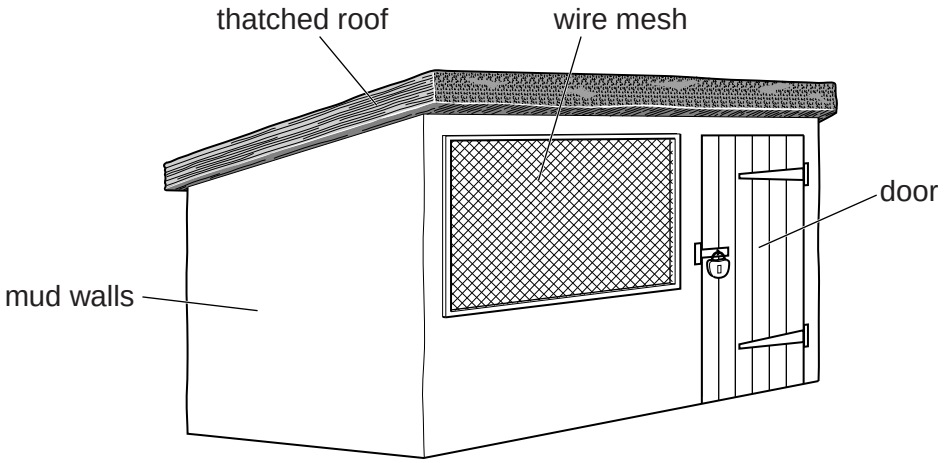

Fig. 9.1

(a) (i) What will be improved by replacing the thatched roof with corrugated iron?

A control of pests

B insulation

C light penetration

D ventilation

answer = ... [1]

(ii) What is the advantage of wire mesh, rather than glass, for the window?

A improved light

B improved security

C improved ventilation

D improved warmth

answer = ... [1]

(iii) The house in Fig. 9.1 is suitable for small livestock. A house used for large animals is built with concrete blocks rather than mud walls. Suggest a reason for this.

.....

..... [1]

(iv) State **one** advantage of a concrete floor, rather than an earth floor, in an animal house.

.....

(b) State **three** factors that should be taken into account when choosing the site for a livestock house.

1 .....

2 .....

3 ..... [3]

[Total: 7]

Section B

Answer any **two** questions.

Write your answers on the separate answer paper provided.

10 **(a)** What is meant by the term *soil capping* and what causes it? [3]

(b) Explain how physical weathering contributes to soil production. [6]

(c) Describe the properties of a sandy soil. [6]

11 **(a)** What is meant by the term *mixed farming*? [2]

(b) Describe how organic crops are grown. [5]

(c) State the arguments for and against GM (genetically modified) crop production. [8]

12 **(a)** What is meant by the term *zero grazing*? [2]

(b) Describe how a local pasture, suitable for grazing, can be established. Include the names of plants and grasses used. [7]

(c) State the disadvantages of extensive grazing. [6]

13 **(a)** Describe the life cycle, effect and spread of a **named** piercing and sucking crop pest. [8]

(b) What is meant by cultural pest control? [3]

(c) Explain the advantages of cultural control over chemical control. [4]

14 **(a)** What is meant by the term *weaning*? [2]

(b) Describe the process of mating and fertilisation in a named mammalian farm animal. [7]

(c) Explain how selective breeding can improve livestock. [6]