Cambridge
O Level

Cambridge International Examinations
Cambridge Ordinary Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

2084178716

AGRICULTURE **5038/12**

Paper 1 **October/November 2014**

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 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.
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	
9	
Section B	
Total	

This document consists of **20** printed pages.

CAMBRIDGE International Examinations

Section A

Answer **all** the questions.

1 **(a)** Fig. 1.1 shows some activities on a farm.

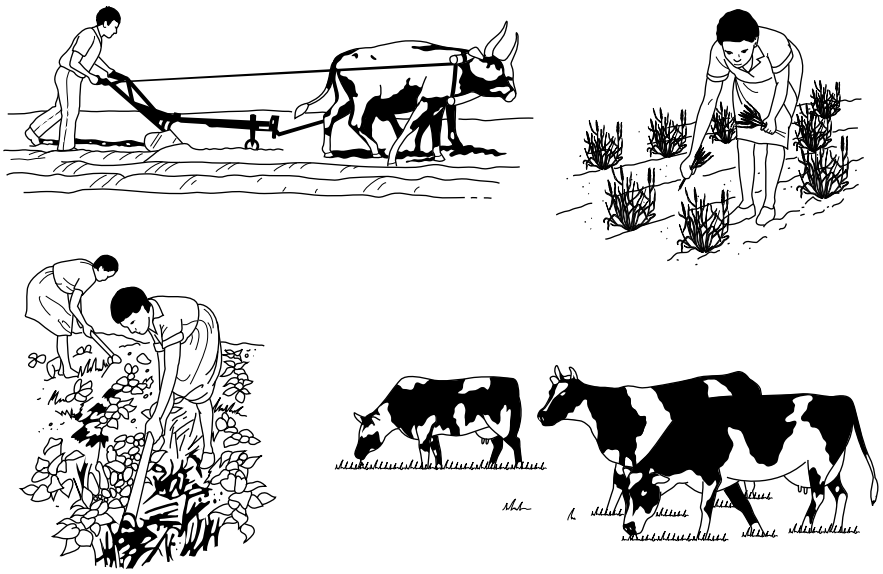


Fig. 1.1

Which type of farming is represented by the diagrams?

A arable

B livestock

C mixed

D monoculture

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

(b) Forestry is another farming activity.

(i) Name two products, other than timber, that can be obtained from trees.

1 ..... 2 .....[2]

(ii) State two reasons why forests are environmentally important.

1 .....

.....

2 .....

.....[2]

(iii) Suggest one reason why it is better to fell a forest in small areas over a period of time rather than cut down the whole forest at once.

.....

.....[1]

[Total: 6]

2 Fig. 2.1 shows a soil profile.

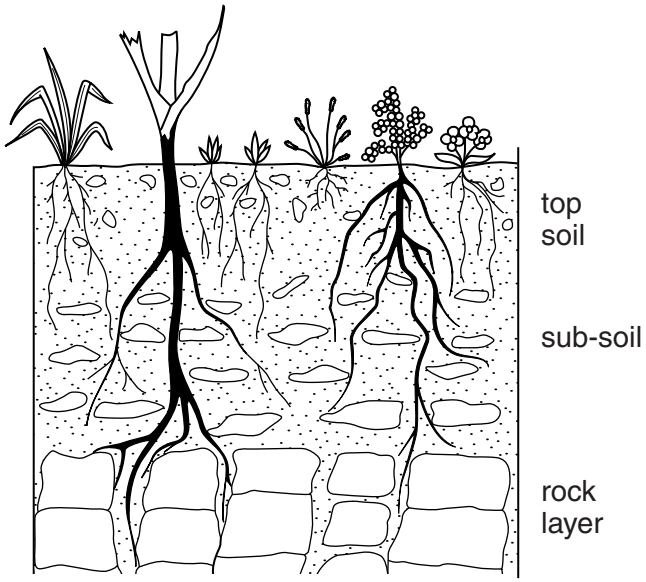


Fig. 2.1

(a) Put a label line and the letter **H** on Fig. 2.1 to show where humus is formed. [1]

(b) Explain how plants help break the rock up to form soil.

.....

.....

.....

.....[2]

(c) Soils formed from different rocks have different pH values.

pH values can be determined using a soil pH test kit.

The solution in the kit may change colour.

What colour would you expect to see at the following pH values?

Choose from the following colours

blue **brown** **green** **orange** **purple** **red**

pH 4.5 ..... pH 6.0 .....

pH 7.0 ..... pH 8.5 .....

[2]

(d) Which soil pH is most suitable for growing the majority of crops?

Give a reason for your answer.

pH value .....

reason .....

.....

.....[2]

[Total: 7]

3 Fig. 3.1 shows two farms with different soil types.

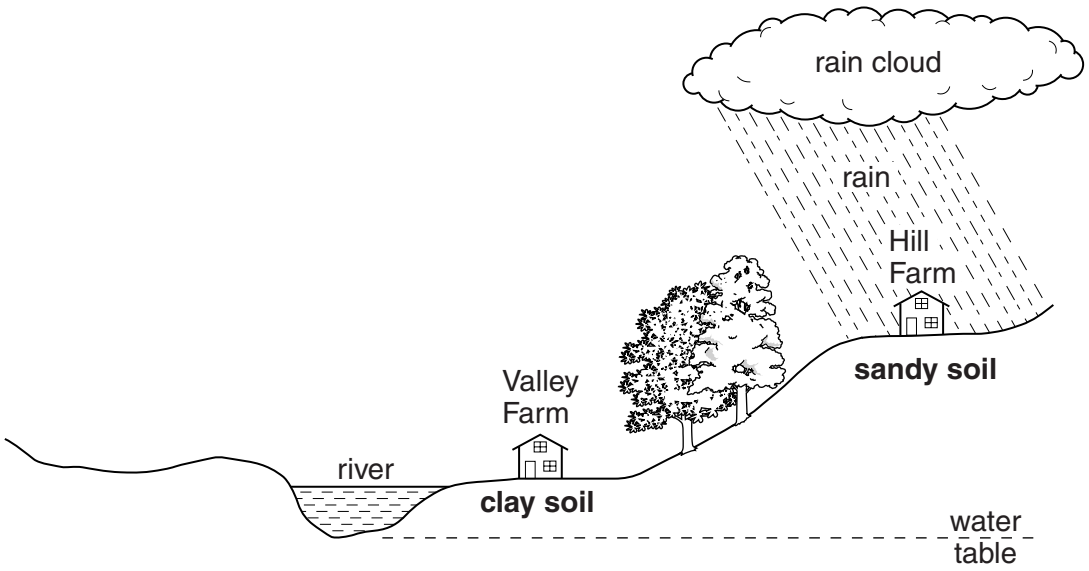


Fig. 3.1

The fields of Valley Farm lie on clay soil near a river.
The fields of Hill Farm are on higher ground and are sandy.
Both farms are south-facing.

(a) Which farm would be most suitable for growing root crops?

Give two reasons for your answer.

farm .....

reason 1 .....

.....

reason 2 .....

.....[2]

(b) Water for Valley Farm can be obtained from the river.

State two ways a supply of water could be obtained at Hill Farm.

1 .....

.....

2.....

.....[2]

(c) Water can be supplied to the farm buildings through pipes.

Fig. 3.2 shows how two plastic pipes can be joined.

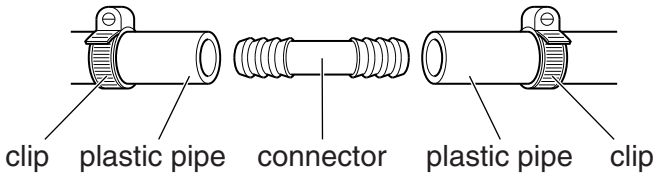


Fig. 3.2

What should be done to make the task of joining these plastic pipes easier without causing leaks?

A heat the connector in a flame

B place the pipe ends in hot water

C soak the connector in petrol

D split the pipe ends with a knife

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

(d) Fig. 3.3 shows a pipe system for a farm.

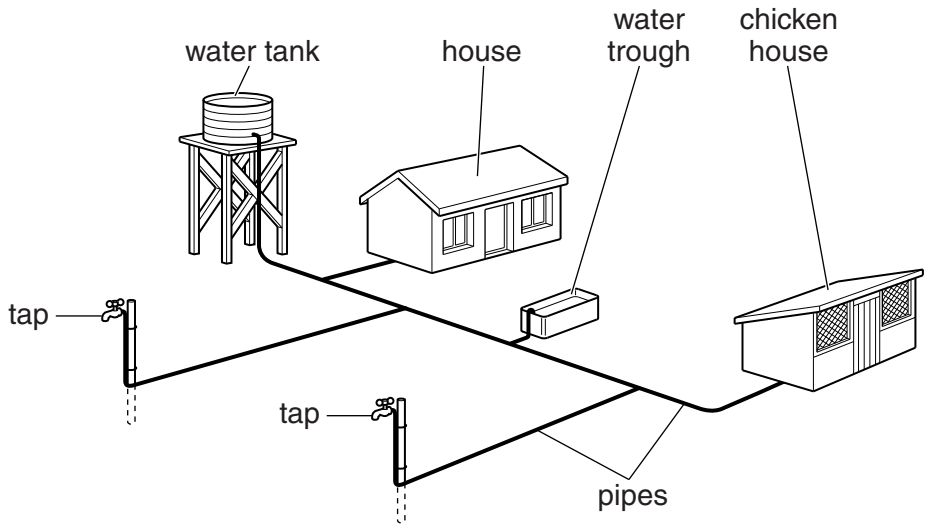


Fig. 3.3

Which change would increase water pressure to the taps?

A fitting larger taps

B increasing the diameter of the water tank

C raising the height of the water tank

D using narrower pipes

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

[Total: 6]

4 **(a)** Which statement below represents photosynthesis?

A carbon dioxide + chlorophyll $\xrightarrow{\text{light}}$ carbohydrate + water

B carbon dioxide + water $\xrightarrow[\text{chlorophyll}]{\text{light}}$ carbohydrate + oxygen

C carbohydrate + oxygen $\xrightarrow[\text{chlorophyll}]{\text{light}}$ carbon dioxide + water

D carbohydrate + water $\xrightarrow[\text{chlorophyll}]{\text{light}}$ oxygen + carbon dioxide

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

(b) Crops can be grown to provide a source of energy (biofuel crops).

Fig. 4.1 shows the relative benefit to countries in different parts of the world of growing biofuel crops.

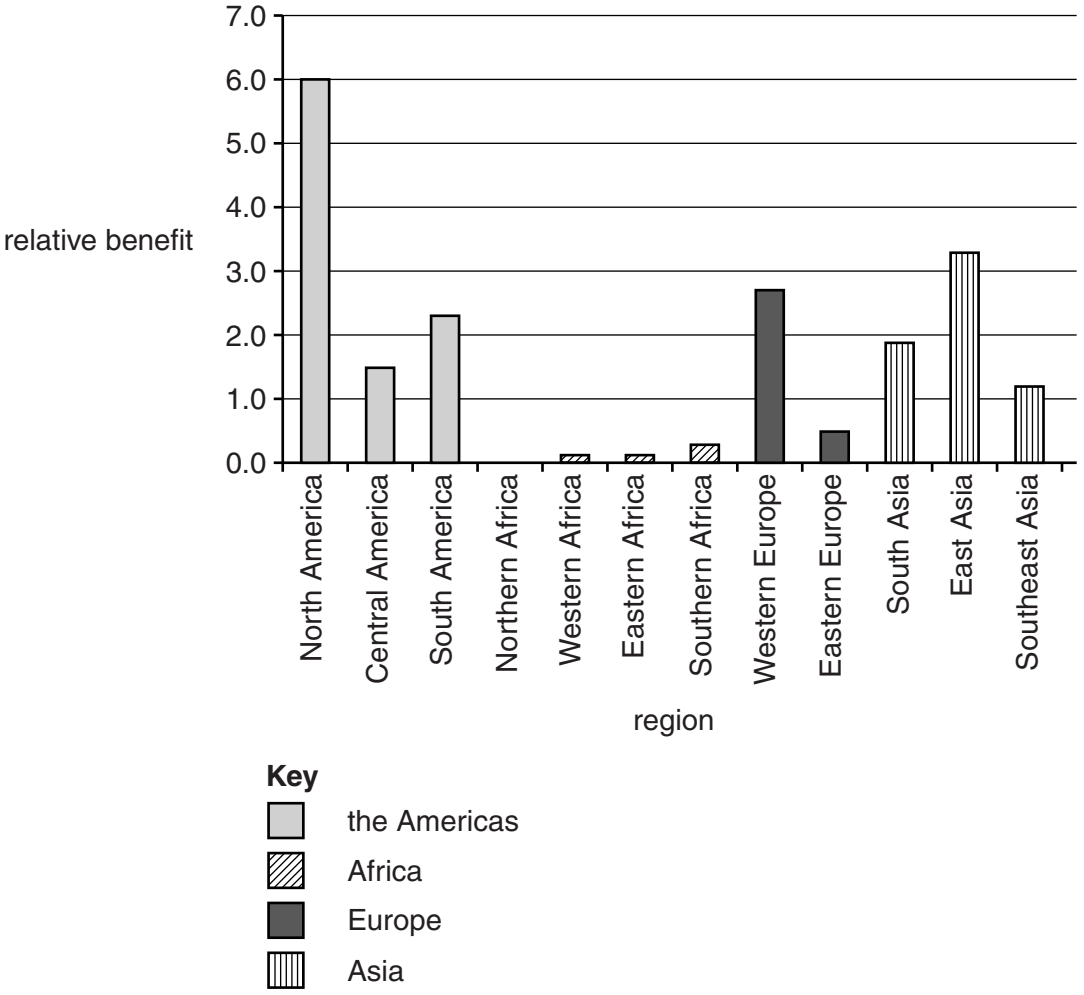


Fig. 4.1

(i) List the continents in the order they would benefit from growing biofuel crops.

Africa **the Americas** **Asia** **Europe**

One has been done for you.

most benefit .....

.....

.....

least benefit ..... Africa ..... [1]

(ii) Suggest two reasons why so little benefit is possible in Africa.

1 .....

.....

2 .....

.....[2]

(c) Table 4.1 shows how different crops can be used to produce biofuels.

Table 4.1

crop plants	raw material extracted	method of production	biofuel
potatoes cereals (grain)	starch	converted to sugar, then fermentation	ethanol
sugar cane sugar beet	sugars	fermentation	ethanol
cereals (straw) wood	cellulose	converted to sugar, then fermentation	ethanol
giant grass prickly pear	whole plant used	drying	solid fuel
linseed sunflower	vegetable oil	refining	biodiesel

(i) Name a crop that does not require a complex production process to produce biofuel.

.....[1]

(ii) Name a crop which provides more than one type of raw material for processing into biofuel.

.....[1]

(d) A farmer plans to grow a cereal crop on a one hectare plot.

(i) Table 4.2 shows the estimated balance sheet that he will use to decide whether or not to grow the cereal crop.

Complete Table 4.2 using the information given.

The cost of seed is $200 per 50 kg sack. The sowing rate is 200 kg per hectare.

Grain sells for $150 per 50 kg sack.

The estimated yield is 3000 kg per hectare.

Table 4.2

expenditure		sales	
item	$	item	$
seed	.....	grain	.....
other inputs	5400		
total	.....	total	.....
		profit	.....

[4]

(ii) State one example of 'other inputs' listed under expenditure in Table 4.2.

.....[1]

[Total: 11]

5 **(a)** What most often provides the soil with nitrate?

A chemical weathering

B lime

C organic matter

D physical weathering

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

(b) Fig. 5.1 shows part of the nitrogen cycle.

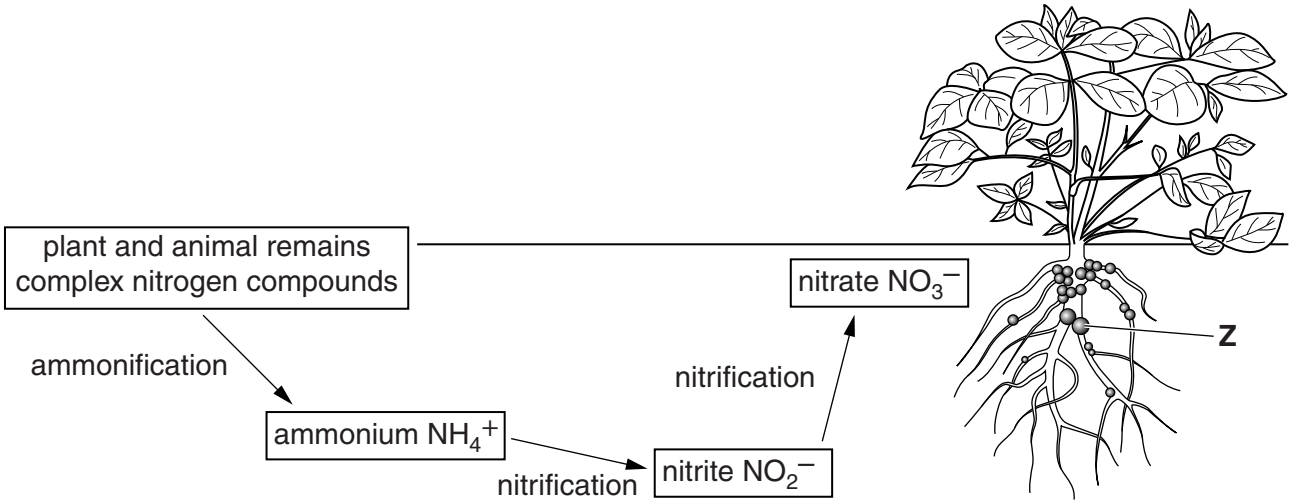


Fig. 5.1

Outline the role of **Z** in the nitrogen cycle.

.....

.....

.....

.....[2]

(c) State the effects of nitrogen deficiency on plant growth and development.

.....

.....

.....[2]

(d) Suggest two farming practices that can lead to loss of nitrogen from the soil.

1 .....

.....

2 .....

.....[2]

[Total: 7]

6 Fig. 6.1 shows the digestive system of a ruminant. The parts of the digestive system are represented by the letters **A**–**K**.

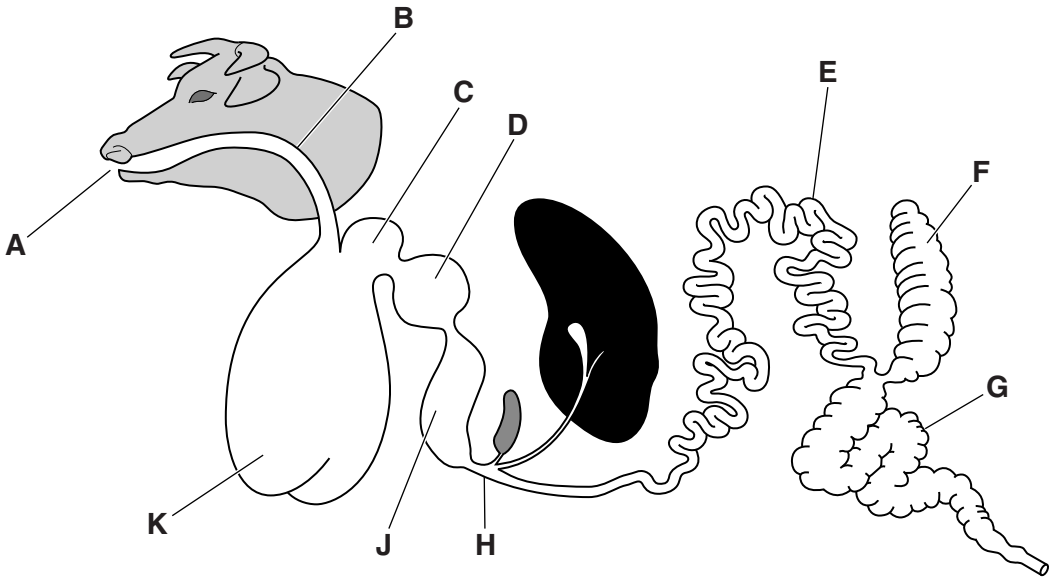


Fig. 6.1

(a) (i) Use the letters **A**–**K** in Fig. 6.1 to show the path followed by a food particle as it passes from the mouth, **A**, to the duodenum, **H**.

A .....

.....

.....

B .....

A .....

.....

.....

.....

.....

H ..... [3]

(ii) Name the parts of the digestive system in Fig. 6.1 labelled

D .....

E ..... [2]

(iii) State the letters representing two organs on Fig. 6.1 where microbes are active.

1 .....

2 ..... [2]

(b) Explain the role and importance of microorganisms in ruminant digestion.

.....

.....

.....

.....

.....[2]

[Total: 9]

7 Fig. 7.1 shows the reproductive system of a male pig.

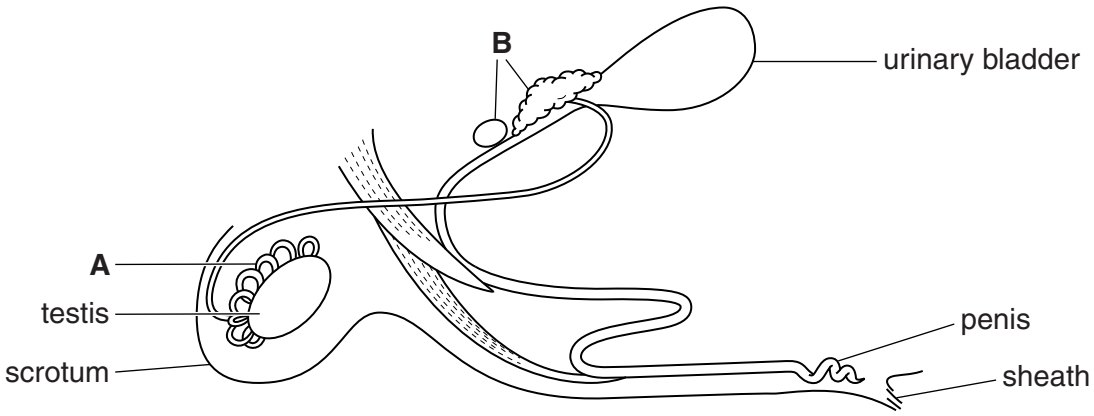


Fig. 7.1

(a) (i) State the name of the part labelled **A** on Fig. 7.1. ..... [1]

(ii) State a function of the glands labelled **B** on Fig. 7.1.

.....[1]

(iii) Fig. 7.2 shows the shape of the tip of the penis of a pig.

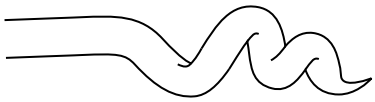


Fig. 7.2

Suggest an advantage of the tip of the penis being this shape.

.....

.....[1]

(b) (i) In reproduction, the features of an organism are passed to the next generation on chromosomes in the nucleus of the sperm and egg.

The nucleus of each body cell of the pig contains 38 chromosomes.

How many chromosomes are there in the nucleus of the sperm?

A 2

B 19

C 38

D 76

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

(ii) Describe the structure of a chromosome.

.....

.....

.....

.....[2]

(iii) In pigs, the allele for non-pigmented skin, **N**, is dominant to the allele for pigmented skin, **n**.

What is the genotype of a pigmented pig?

A **nN**

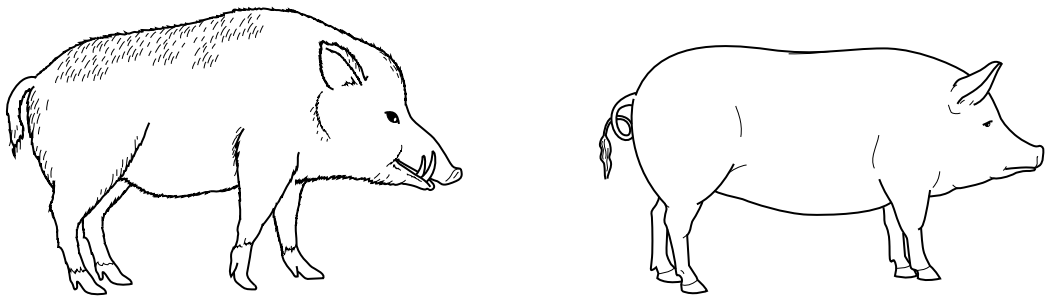
B **nn**

C **Nn**

D **NN**

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

(c) Fig. 7.3 shows a wild boar and a domestic pig.



wild boar

domestic pig

Fig. 7.3

How has the development from the wild boar to the domestic pig been achieved?

A by feeding balanced rations

B by improving husbandry

C by providing indoor housing

D by using artificial selection

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

[Total: 8]

8 **(a)** Why are all types of weeds harmful to crops?

A They all compete with crops.

B They all attract insects.

C They all slow down cultivation.

D They all are poisonous.

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

(b) Weeds can be controlled by cultural, mechanical and chemical methods.

(i) State one method of cultural control.

.....

(ii) State one method of mechanical control.

.....[2]

(c) Fig. 8.1 shows a weed that spreads from underground rhizomes.

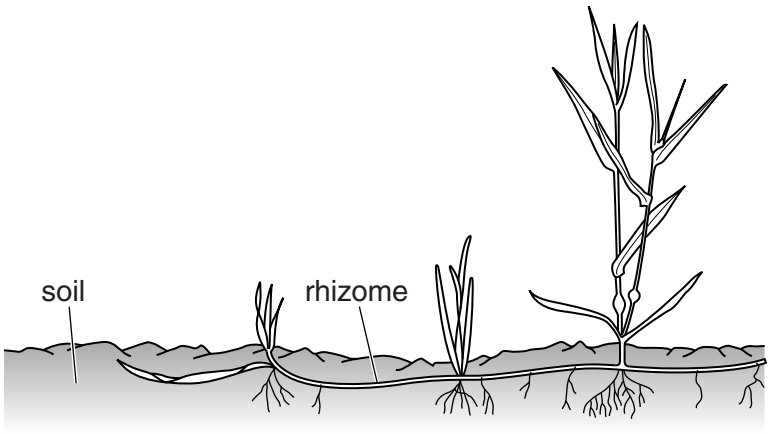


Fig. 8.1

Suggest why chemical control of the weed in Fig. 8.1 would be better than cultural or mechanical control.

.....

.....

.....

.....[2]

(d) Chemical control involves the use of sprayers.

State two maintenance procedures that should be carried out on the sprayer **after** use.

1 .....

.....

2 .....

.....[2]

[Total: 7]

9 Fig. 9.1 shows a poultry house.

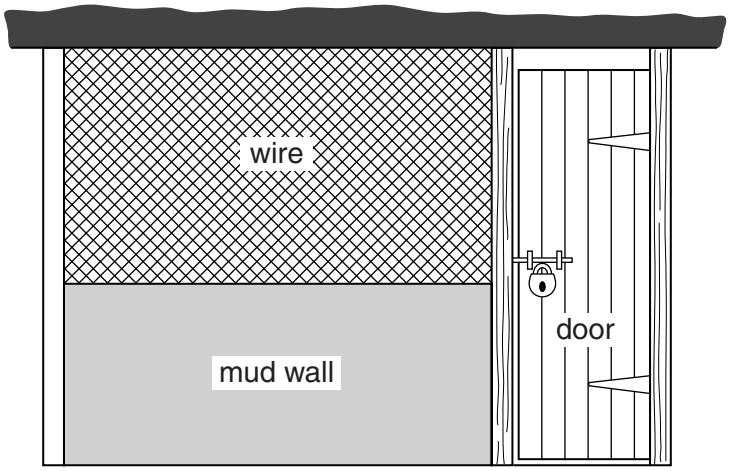


Fig. 9.1

(a) (i) Why is wire, rather than glass, used for the front of the house?

A to keep pests out

B to keep poultry in

C to let air in

D to let light in

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

(ii) Name a material that could be used for the roof of the house.

Give two reasons for your choice.

material .....

reason 1 .....

.....

reason 2 .....

.....[2]

(iii) An enclosed wire run can be attached to the side of the house.

Chickens can get in and out through a small opening (pop hole).

Suggest **one** advantage and **one** disadvantage of having a side run rather than allowing the chickens to range freely.

advantage .....

.....

disadvantage .....

.....[2]

(b) Table 9.1 shows the number of eggs laid during a period of three weeks by three hens.

Table 9.1

Days	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
hen **1**	●	●	●		●	●	●		●	●	●		●	●	●		●	●	●		●
hen **2**		●	●		●	●	●		●	●		●	●	●		●	●		●	●	●
hen **3**	●	●	●	●	●		●	●	●	●	●		●	●	●	●	●		●	●	●

(i) Describe the pattern of egg laying shown by

hen **1** .....

.....

hen **2** .....

.....[2]

(ii) Suggest **two** reasons why the numbers of eggs laid by the three hens vary.

.....

.....

.....

.....[2]

[Total: 9]

Section B

Answer **two** questions in this section.

Write your answers on the separate paper provided.

10 **(a)** What are the advantages of *monoculture*? [4]

(b) Explain how land use may be limited by environmental factors. [5]

(c) Describe how an increase in human population may lead to the development of intensive farming, giving examples. [6]

11 For a **named** crop, describe

(a) the preparation of the soil prior to seed sowing **or** planting, [4]

(b) the method and details of seed sowing **or** planting, [5]

(c) the way pests and weeds are controlled during the growth of the crop. [6]

12 **(a)** Outline the functions of water in a plant. [3]

(b) **(i)** Describe the construction of a storage dam wall.

(ii) Outline methods by which water from the dam can be used to irrigate nearby crops. [8]

(c) Suggest how over-watering can reduce the yield of a crop. [4]

13 **(a)** Explain what is meant by a *notifiable/scheduled disease*. [3]

(b) Describe how diseases of livestock can be prevented by good hygiene. [6]

(c) Describe the problems caused by parasites in a **named** farm animal you have studied. [6]

14 **(a)** Explain what is meant by *pollination*. [3]

(b) Compare the characteristics of wind-pollinated flowers with those of insect-pollinated flowers. [7]

(c) Describe the process of asexual reproduction using stem cuttings. [5]