

CANDIDATE
NAME

CENTRE
NUMBER

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CANDIDATE
NUMBER

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AGRICULTURE

5038/12

Paper 1

October/November 2018

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	
9	
Section B	/
Total	

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

Section A

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

1 Soil is created by the processes of biological and chemical weathering of rocks.

(a) State **one** example of each of these processes.

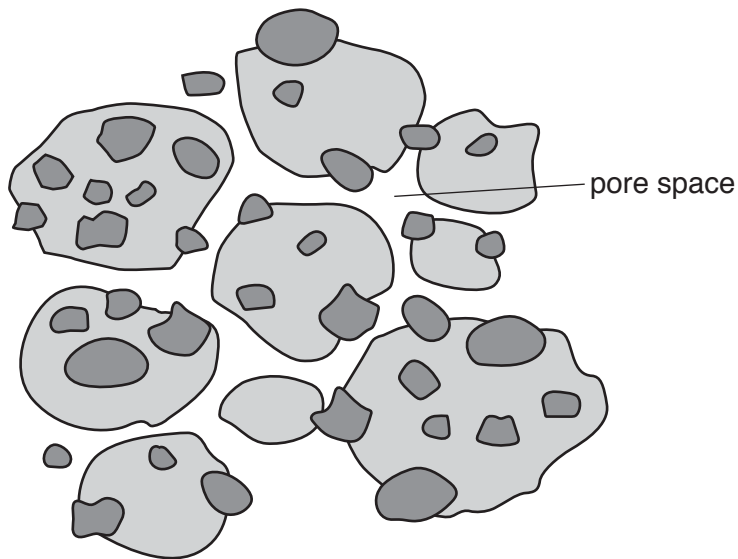
(i) biological weathering

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

(ii) chemical weathering

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

(b) The diagram represents the structure of a loam soil.



(i) Describe **two** properties of this soil.

1

2

[2]

(ii) State **one** property of a clay soil which would be different from a loam soil.

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

(c) (i) State what is meant by the term *soil pan*.

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

(ii) Describe how soil pans can affect the properties of a soil.

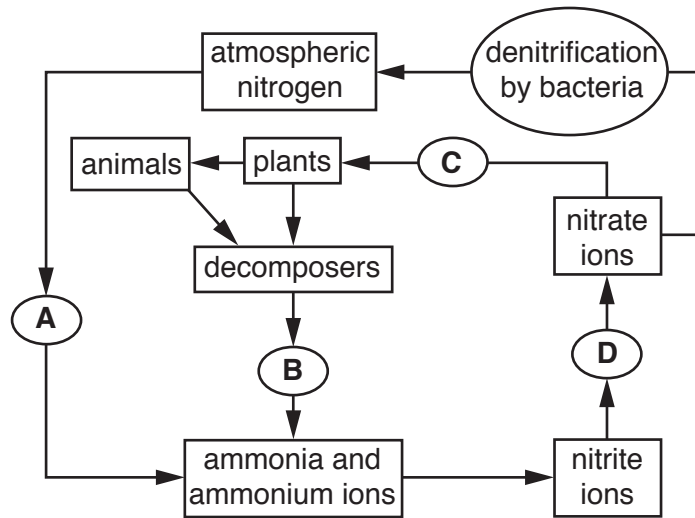
.....
.....
.....
..... [2]

(iii) Explain how farming practices can cause the formation of soil pans.

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

[Total: 10]

2 (a) The diagram represents part of the nitrogen cycle.



State which letter from the diagram represents each of these statements.

(i) nitrification Answer **A, B, C** or **D** [1]

(ii) nitrogen fixation Answer **A, B, C** or **D** [1]

(b) (i) Describe **one** symptom of nitrogen deficiency in a crop.

.....
 [1]

(ii) Describe how a nitrogen deficiency could be corrected on an organic crop farm.

.....
 [1]

(c) A 50 kg sample of fertiliser contains 7% nitrogen by mass.

Calculate the mass of nitrogen in the sample.

Show your working.

..... [2]

[Total: 6]

3 The photograph shows a seed-bed being prepared using an ox and harrow.



(a) State **one** advantage and **one** disadvantage of replacing the ox with a tractor.

advantage

.....

disadvantage

.....

[2]

(b) Describe how the harrow should be maintained.

.....

.....

.....

.....

.....

.....

[3]

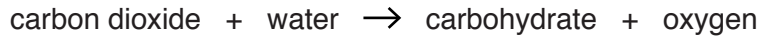
(c) Complete the table to explain why each of the actions is required to cultivate a crop.

action	explanation
adding manure to the soil	<p>.....</p> <p>.....</p>
creating a seed-bed	<p>.....</p> <p>.....</p>
adding pesticide to seed-bed or seed	<p>.....</p> <p>.....</p>

[3]

[Total: 8]

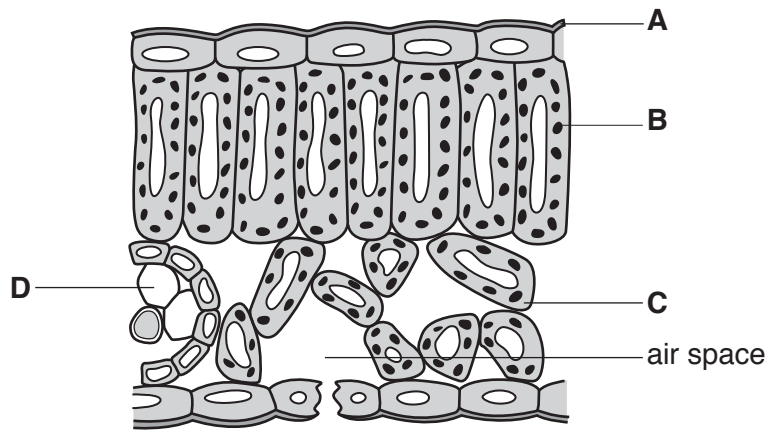
4 The process of photosynthesis is described by this equation.



(a) State **two** requirements for photosynthesis **not** shown in the equation.

- 1
- 2 [2]

(b) The diagram shows a cross-section of part of a leaf.



(i) Where does most photosynthesis take place?

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

(ii) Describe how the structure of a leaf is adapted for photosynthesis.

-
-
-
- [2]

(c) Explain the role of stomata in transpiration.

-
-
-
- [2]

[Total: 7]

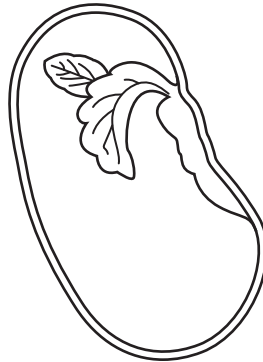
5 (a) The diagram shows a cross-section of a bean seed that has started to germinate.

(i) Label the diagram using the following words.

cotyledon

embryonic root

seed coat



[3]

(ii) State where food reserves are stored in the bean seed.

..... [1]

(b) Describe the function of the embryo.

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

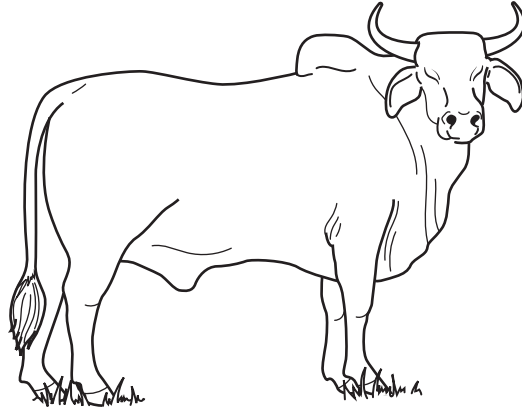
(c) Draw and label a diagram of a bean plant as it emerges from the soil.

[3]

[Total: 8]

6 (a) Selective breeding can be used to produce animals with desired characteristics.

The diagram shows a male animal selected for breeding.



(i) Describe the phenotype of the animal selected.

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

(ii) Explain why some of the offspring produced using the male in the diagram will **not** look identical to their father.

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

(b) The coats of some cattle are spotted. This is caused by a single recessive allele *d*.

(i) State what is meant by the term *allele*.

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

(ii) Calculate the expected ratio of spotted cattle to plain cattle in the offspring produced from crossing two heterozygous parents.

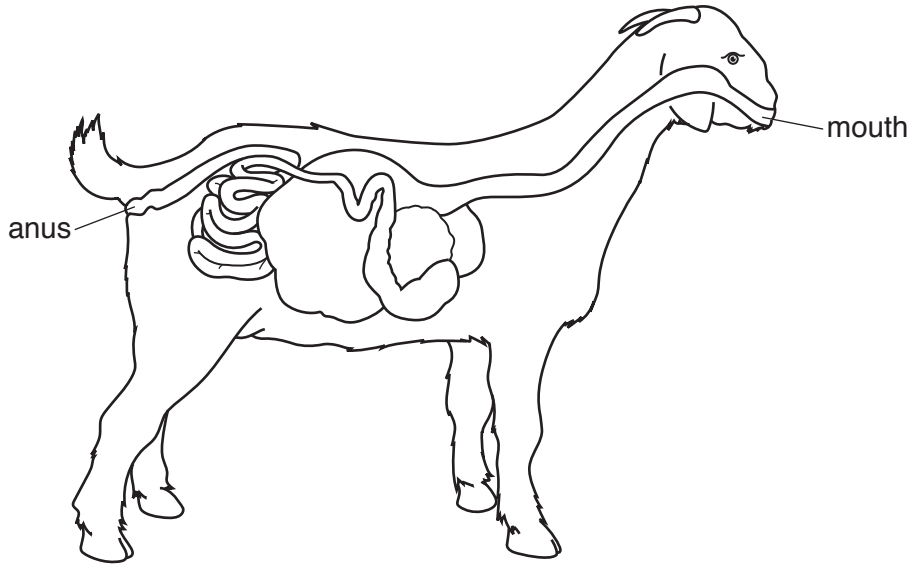
Show your working.

ratio [3]

[Total: 7]

7 The diagram shows a cross-section through part of the digestive system of a ruminant.

(a) Label the **oesophagus**, **rumen** and **reticulum** on the diagram.



[3]

(b) Describe **two** functions of the small intestine.

1

.....

2

.....

[2]

(c) Describe **two** differences between the digestive system of a ruminant and non-ruminant animal.

1

.....

2

.....

[2]

(d) Explain how a ruminant animal can extract valuable nutrients from a diet high in fibre.

.....

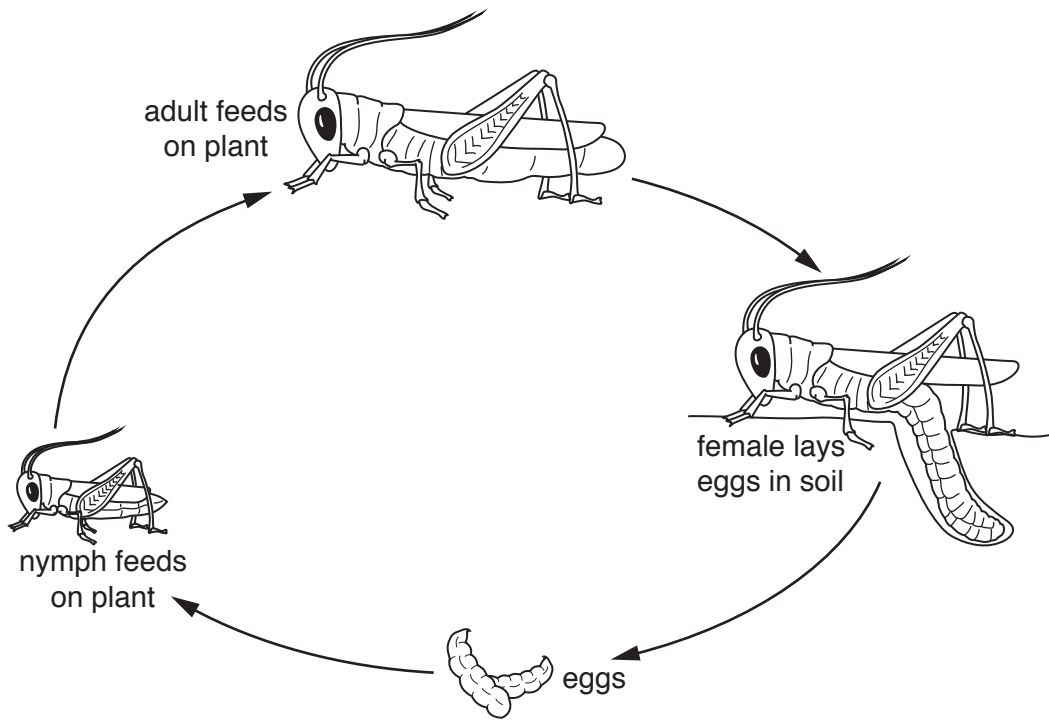
.....

.....

.....

[2]

8 The diagram shows the life cycle of a crop pest.



(a) Suggest **two** ways knowledge of the life cycle could be used to control this pest.

1

.....

2

.....

[2]

(b) Name **one** example of a biting and chewing crop pest.

..... [1]

(c) Describe **three** ways in which crop pests can be controlled without chemicals.

1

.....

2

.....

3

.....

[3]

(d) Explain why a systemic pesticide is likely to be effective at controlling crop pests.

.....

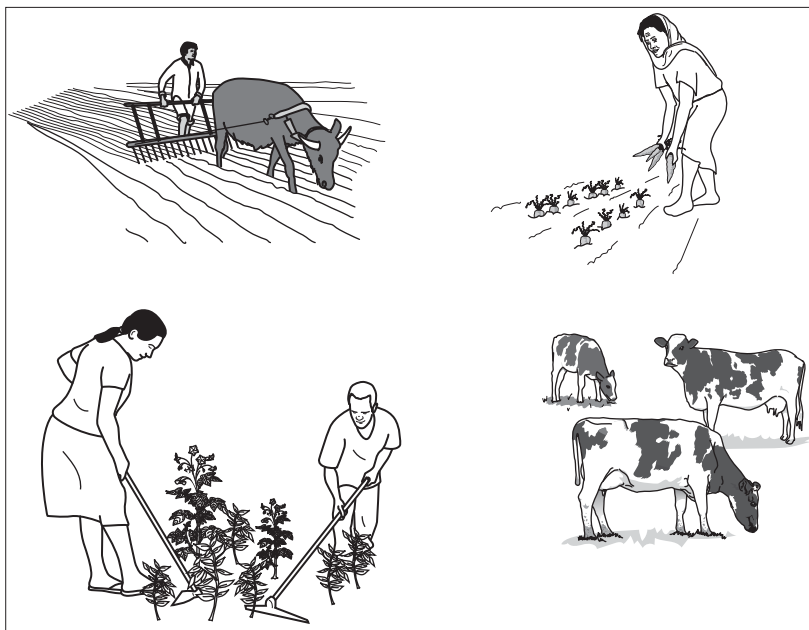
.....

.....

..... [2]

[Total: 8]

9 (a) The diagram shows activities on a single farm.



Which type of farming is shown by the diagram?

- A arable
- B livestock
- C mixed
- D monoculture

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

(b) (i) Describe what is meant by the terms *irrigation* and *drainage*.

irrigation

.....

drainage

.....

[2]

(ii) Describe **one** benefit and **one** limitation of using open channels for irrigation in a grazing system.

benefit

.....

limitation

.....

[2]

(iii) Explain how poor drainage can damage soils.

.....

.....

.....

..... [2]

[Total: 7]

Section B

Answer any **two** questions.

Write your answers on the separate paper provided.

- 10** (a) State what is meant by the term *hydroponics*. [2]
- (b) Describe advantages and disadvantages of hydroponics compared to traditional methods of crop production. [7]
- (c) Discuss the possible benefits of growing genetically modified crops. [6]
- 11** (a) Explain what is meant by the term *weaning*. [3]
- (b) Describe the care required to be given to a young mammalian farm animal. [8]
- (c) Explain why colostrum is important to newborn animals. [4]
- 12** (a) Describe the differences between sexual and asexual reproduction. [6]
- (b) Describe the process of fertilisation in a plant. [4]
- (c) Explain, using an example, why farmers would use asexual reproduction for their crops. [5]
- 13** (a) Describe, using examples, how different hand tools should be maintained. [4]
- (b) Explain how hand tools could be used to construct a wooden fence. [6]
- (c) Describe the different types of fence used on farms and explain their purposes. [5]
- 14** (a) Describe the properties of a sandy soil. [4]
- (b) Describe how to test the soil pH of a large field. [7]
- (c) Explain why maintaining a good crumb structure in soil is important. [4]

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