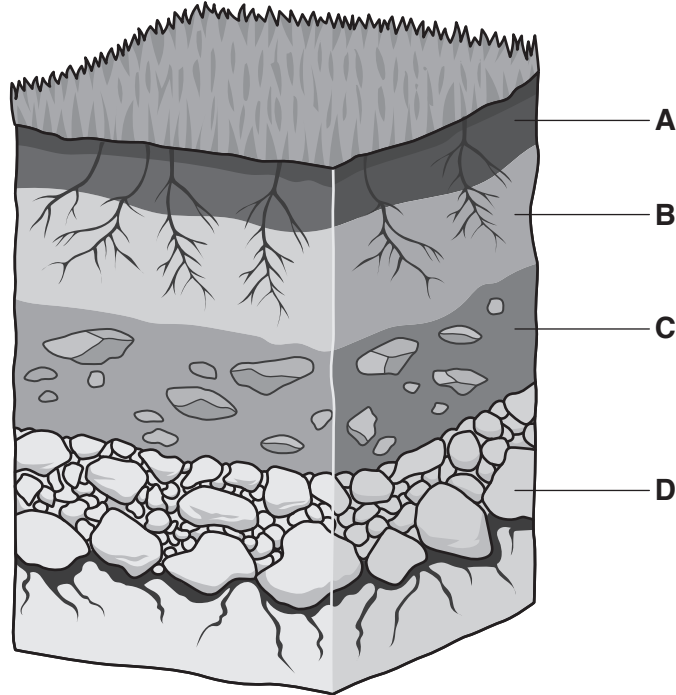


Section A

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

1 The diagram shows a soil profile.



(a) Select **one** letter from the diagram that represents each of the following.

(i) underlying material

.....[1]

(ii) the labelled layer with most organic matter

.....[1]

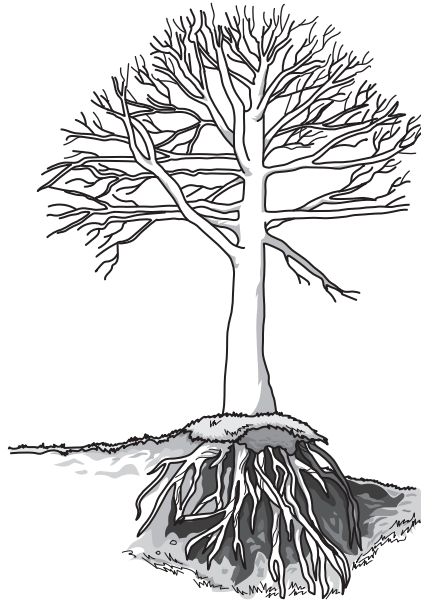
(b) State **two** living things found in layer **A** of a soil profile.

1

2

[2]

2 (a) The diagram shows an effect of soil erosion.



Describe what is meant by the term *soil erosion*.

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

(b) State **one** possible cause of soil erosion. Suggest how to reduce the effects of this cause.

cause

suggestion

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

(c) Suggest **two** reasons for irrigating crops.

1

.....

2

.....[2]

(d) Crops can be affected by overwatering.

Explain why.

.....

.....

.....

..... [2]

[Total: 7]

3 (a) State what is meant by the term *sexual reproduction*.

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

(b) State **three** differences between the structures of bean and maize flowers.

1

.....

2

.....

3

.....[3]

(c) The following are stages of sexual reproduction in plants.

- A fertilisation occurs
- B pollen lands on the stigma
- C pollen tube enters ovary
- D pollen tube grows through style

Using the letters **A, B, C** and **D** put these stages in the correct order.

.....[1]

(d) Describe the process of fertilisation in a plant.

.....

.....

.....

.....

.....

.....

.....[3]

(e) Some flowers are able to self-pollinate.

Suggest why it is still important that insects, such as bees, pollinate flowers.

.....

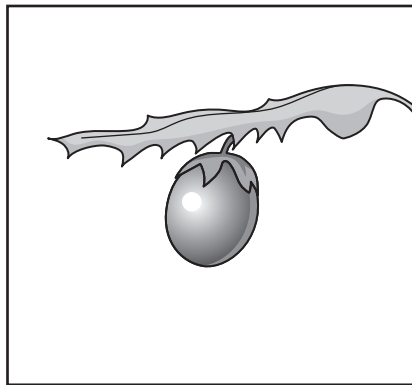
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.....

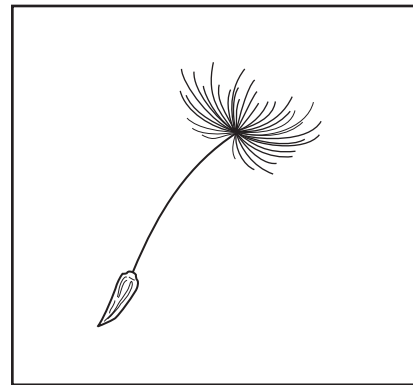
..... [2]

[Total: 10]

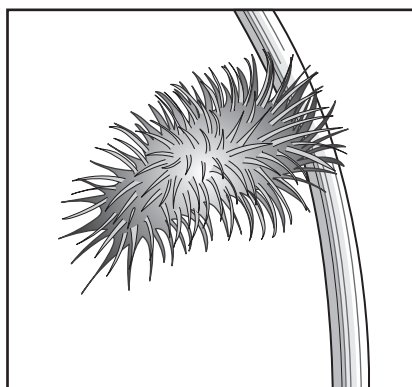
4 (a) The diagrams show weed seeds and fruit.



A

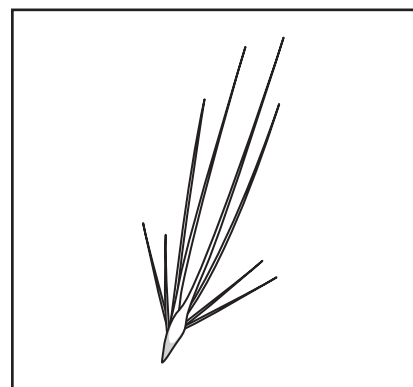


B



C

(not to scale)



D

(i) Which seed or fruit is dispersed by wind?

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

(ii) Select **one** other seed or fruit from the diagrams and suggest how it is dispersed.

seed or fruit

how dispersed

.....

.....

.....

[2]

(b) Weeds can cause reduced yields of crops.

(i) State **two** problems that weeds cause to growing crops.

1

.....

2

.....

[2]

(ii) Suggest why weed seeds should be removed from harvested crops.

.....

..... [1]

(iii) Describe **one** method of weed control and explain why it is effective.

.....

.....

.....

.....

.....

.....

..... [3]

[Total: 9]

6 The photograph shows a farmer pouring a chemical into the mixing tank of a sprayer.



(a) State **one** safety precaution used by the farmer and describe a reason for this.

safety precaution

reason

.....

[2]

(b) (i) Give a reason why the sprayer should be cleaned after use.

.....

.....[1]

(ii) Describe how the sprayer should be cleaned after use to avoid pollution.

.....

.....

.....

.....[2]

(c) Explain why using the correct dilution of chemical sprays is important.

.....

.....

.....

.....[2]

(d) Name **one** type of farm chemical and suggest an alternative method that is likely to cause less damage to the environment.

type of farm chemical

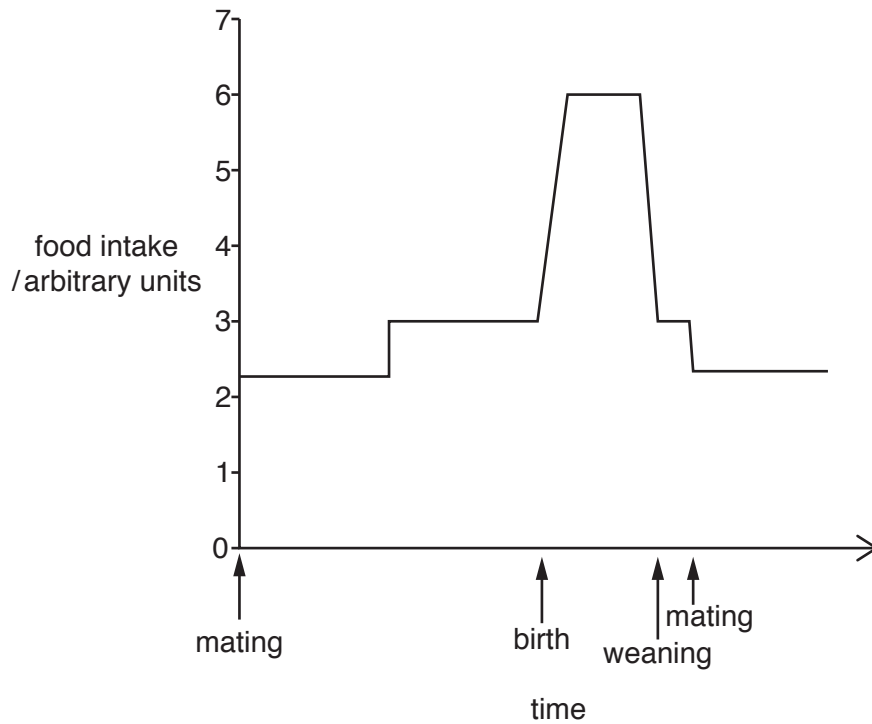
alternative method

.....

[1]

[Total: 8]

7 (a) The diagram shows the food intake of a female farm animal over its reproductive cycle.



(i) State the food intake required at weaning.

..... arbitrary units [1]

(ii) Give **one** reason why food intake increases after giving birth.

.....
 [1]

(iii) Suggest a high-energy food material for this farm animal.

..... [1]

(b) Suggest why it is important that female dairy animals are **not** underweight when joining the adult herd.

.....

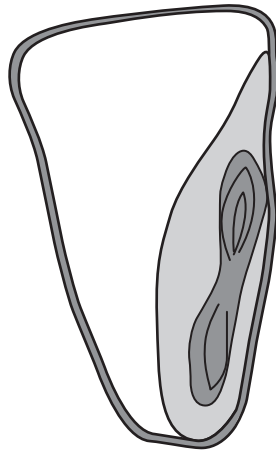
 [3]

[Total: 6]

8 (a) The diagram shows a cross-section of a maize seed.

(i) Label the diagram using the following words.

embryo endosperm seed coat



[3]

(ii) State the function of the endosperm.

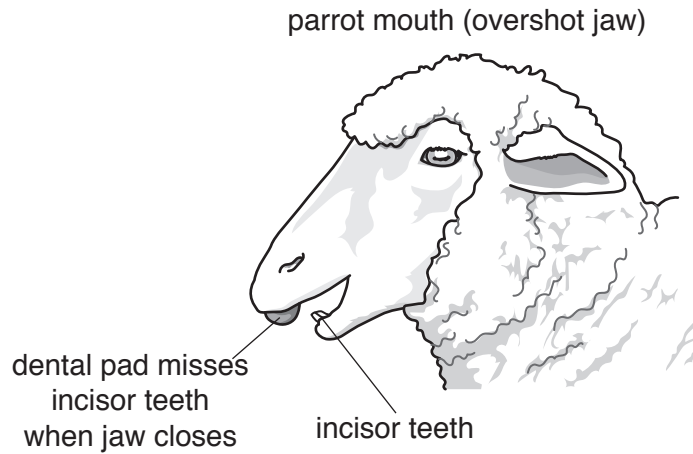
.....
..... [1]

(b) Describe **two** environmental conditions required for the germination of maize.

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

[Total: 6]

- 9 (a) The diagram shows a genetic condition that can affect sheep. This condition is caused by a single recessive gene.



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

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

- (ii) Explain why **not** all offspring of a sheep with parrot mouth show this condition.

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

- (b) The recessive allele *t* causes parrot mouth.

The expected ratio of offspring with parrot mouth to those without parrot mouth when both parents are heterozygous is 1:3.

Show how this ratio is calculated.

(c) (i) Suggest **one** problem for sheep of having parrot mouth.

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

(ii) Describe how selective breeding could be used to produce a flock of sheep in which the condition of parrot mouth is very rare.

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

[Total: 9]

Section B

Answer any **two** questions.

Write your answers on the separate paper provided.

- 10** (a) State what is meant by the term *organic farming*. [3]
(b) Describe the benefits and limitations of organic crop production. [7]
(c) Explain how crop pests are controlled in an organic farming system. [5]
- 11** (a) Describe the process of transpiration. [5]
(b) Describe how environmental factors affect the rate of transpiration. [4]
(c) Explain how plants store the products of photosynthesis. [6]
- 12** (a) Explain what is meant by the term *notifiable* disease and suggest why some diseases are notifiable. [3]
(b) Describe the different ways disease can spread between livestock. [5]
(c) Explain how to reduce the spread of disease between livestock. [7]
- 13** (a) State what is meant by the term *rotational grazing*. [4]
(b) Describe how the use of livestock fencing can increase carrying capacity. [6]
(c) Explain the problems of overstocking. [5]
- 14** (a) Describe what is meant by a *loam* soil. [3]
(b) Explain why the water-holding capacity of a loam soil differs from a sandy soil. [6]
(c) Explain why an effective water-drainage system is needed in a clay soil and describe methods to improve drainage in clay soils. [6]

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