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5038/01

May/June 2007

2 hours

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, graphs or rough working.

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 **three** questions.

Write your answers on the separate 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 **15** printed pages and **1** blank page.

Section A

Answer **all** the questions.

- 1 Fig. 1.1 shows a grass spikelet (flower).

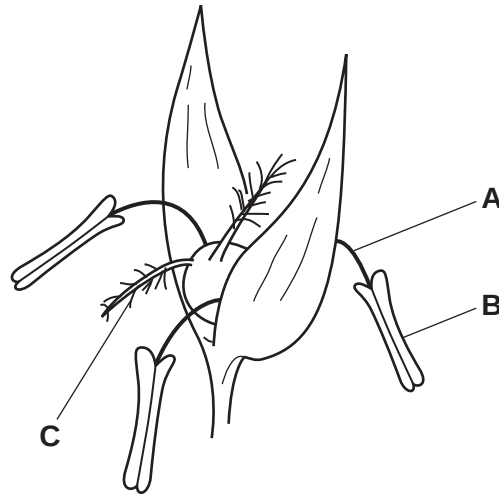


Fig. 1.1

- (a) (i) Name the structures **A**, **B** and **C**.

A

B

C [3]

- (ii) The grass flower is wind-pollinated. State **two** ways in which the diagram shows that the grass flower is adapted for wind pollination.

1

.....

2

..... [2]

(b) Fig. 1.2 shows a maize plant.



Fig. 1.2

(i) What is the function of structure **X**?

..... [1]

(ii) Apart from size, give **one** difference between the flowers of maize and the grass flower in Fig. 1.1.

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

[Total: 7]

- 2 (a) Camspray is a selective herbicide used to kill broad-leaved weeds.



The crops listed in Table 2.1 are growing with broad-leaved weeds. Complete Table 2.1 for each crop to show whether Camspray should be used to kill weeds. Give a reason for each decision.

Table 2.1

Crop	Should the herbicide be used?	Reason
 a growing cereal crop		
 grasses and legumes grown as pasture		
 a growing root crop		

[3]

- (b) Fig. 2.1 shows a type of perennial grass that grows by means of rhizomes (underground stems). A piece of rhizome that has a node can produce shoots and roots and develop into a new plant.

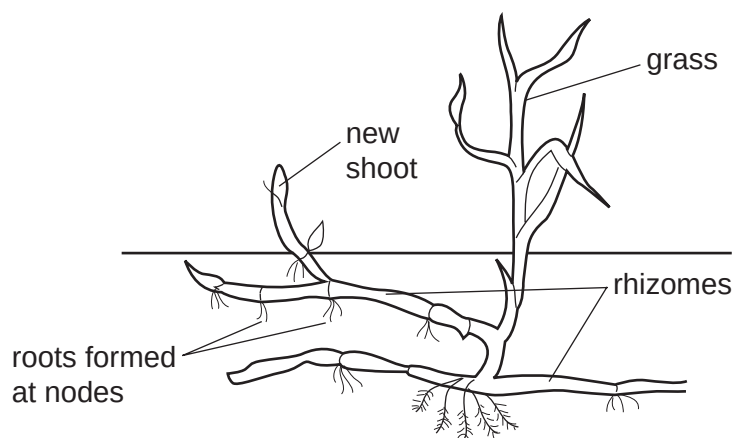


Fig. 2.1

- (i) Suggest **two** reasons why this grass would be suitable for use where animals graze.

1

.....

2

..... [2]

- (ii) This grass is a weed on land that is used for growing crops. Explain why a systemic herbicide would be more effective than hoeing, as a means of controlling this grass.

.....

.....

.....

..... [3]

[Total: 8]

- 3 (a) (i) Name a plant disease caused by a virus.

..... [1]

- (ii) State **one** way to recognise that a plant is infected by this virus.

.....

..... [1]

- (iii) Explain how spraying plants with insecticide may help to control virus diseases.

.....

.....

.....

..... [2]

- (b) Insect pests in crops are often controlled by spraying the plants with insecticides.

- (i) Fig. 3.1 shows a symbol seen on the labels of some insecticides.



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Fig. 3.1

What does this symbol mean?

..... [1]

Fig. 3.2 shows a label from an insecticide spray.

UCLESPRAY

Systemic insecticide for the control of aphids.

FOR USE ONLY AS AN AGRICULTURAL INSECTICIDE



Rates of use

100cm³ **UCLESPRAY** in 200 litres of water. Apply to foliage until run-off.

Timing

Apply when aphids are first seen. Repeat at 10-14 day intervals.

Harvesting Interval

Allow a minimum of two weeks between the last application of **UCLESPRAY** and harvesting the crop.

PRECAUTIONS

1 Wear protective clothing.

8 Keep livestock out of treated areas for 7 days.

9 Do not contaminate ponds and waterways.

10 Do not apply at flowering stage.

Fig. 3.2

- (ii) How much of this spray should be mixed into 10 litres of water? (*Show your working.*)

.....

[2]

- (iii) The spray is to be used on a crop of beans. Explain why the spray should not be applied at the flowering stage of this crop.

.....

.....

.....

[2]

[Total: 9]

- 4 Fig. 4.1 shows a fetus developing in the uterus of a mammal.

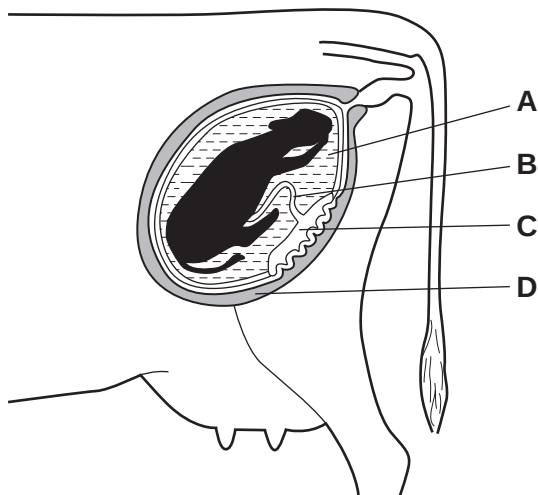


Fig. 4.1

- (a) (i) Name the parts labelled **A**, **B**, **C** and **D**.

A

B

C

D

[4]

- (ii) What is the function of **A**?

.....

.....

.....

[2]

- (b) Table 4.1 shows three periods of time in the reproductive cycle of a cow.

Table 4.1

oestrus cycle	duration of heat	gestation

Complete the table by writing the following figures in the correct places:

18 hours

21 days

283 days

[2]

(c) At which point, in the breeding cycle of a mammal, is colostrum produced?

..... [1]

[Total: 9]

5 In cattle, polled (no horns) is dominant over horned. A polled bull is mated with a herd of polled cows. **P** represents the allele for polled, **p** represents the allele for horned.

(a) What is an *allele*?

.....

..... [1]

(b) (i) Some of the calves produced had horns. Draw a genetic diagram to show how this occurs.

[4]

(ii) What percentage of the calves produced would be expected to have horns?

.....% [1]

[Total: 6]

- 6 Fig. 6.1 shows the valve positions and direction of the piston during part of the four-stroke cycle in a petrol engine.

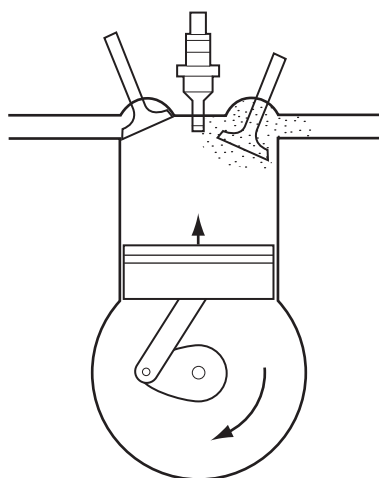


Fig. 6.1

- (a) (i) On the diagram, label:

- 1 the inlet valve
- 2 the exhaust (outlet) valve
- 3 the spark plug
- 4 the piston

[3]

- (ii) Which stroke is shown in Fig. 6.1?

[1]

.....

- (iii) Describe what is happening in the cylinder during this stroke.

.....

.....

.....

..... [3]

- (b) Fig. 6.2 shows a tractor on a slope. X marks its centre of gravity.

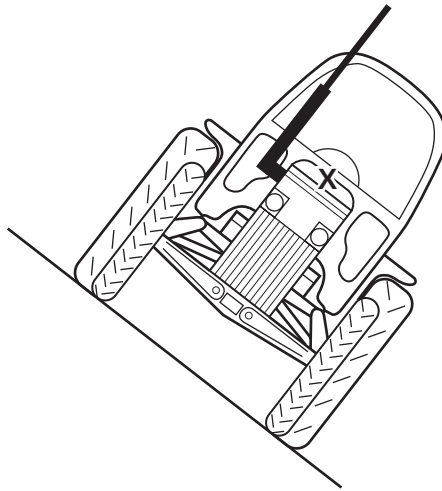


Fig. 6.2

- (i) Use the diagram to explain why the tractor would overturn.

.....

 [2]

- (ii) Suggest **one** way in which the design of the tractor could be changed to make it less likely to overturn.

.....
 [1]

[Total: 10]

7 Fig. 7.1 shows the water cycle.

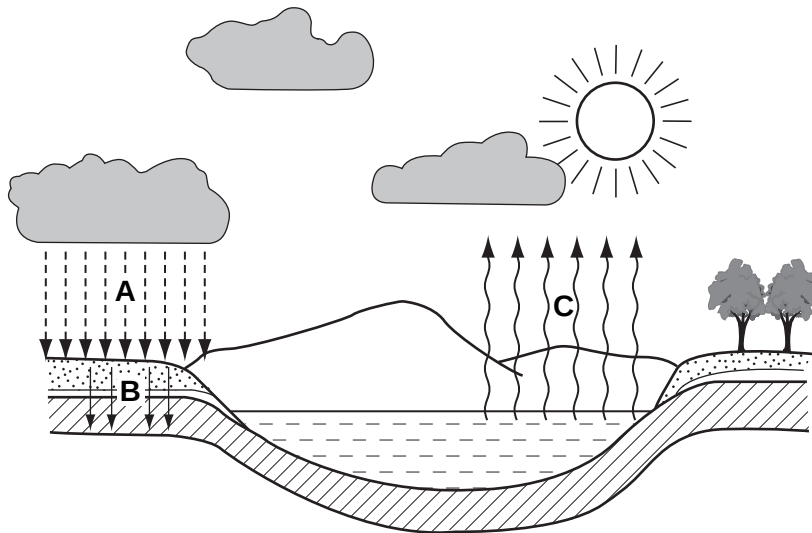


Fig. 7.1

(a) Name the processes occurring at **A**, **B** and **C**.

A

B

C

[3]

(b) Fig. 7.2 shows a root hair cell in the soil.

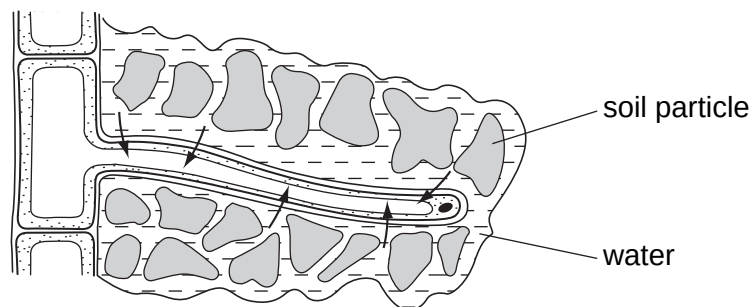


Fig. 7.2

(i) Explain how root hair cells increase the amount of water that a plant can absorb from the soil.

..... [1]

- (ii) What is the name of the process by which water passes from the soil into a root hair cell?

..... [1]

- (iii) What is the difference between the way plants absorb minerals from the soil and the way they absorb water?

.....

..... [1]

[Total: 6]

Section B

Answer any **three** questions. Write your answers on the separate answer paper provided.

- 8 A small garden is divided into three beds. A rotation system is used to grow **three** different vegetables in the garden. One of the vegetables is a legume.

- (a) (i) Suggest three suitable vegetables that could be grown. [1]
 (ii) Explain the importance of using a legume in the rotation. [3]
 (iii) Use diagrams to illustrate the rotation pattern over three years. Give reasons for the order of crops that you have shown. [4]
 (iv) Explain why crops should be rotated instead of being grown in the same bed each year. [4]

- (b) In many cities people are being encouraged to grow vegetables on pieces of waste ground between buildings and alongside roads. Suggest why it is important to encourage people to grow food for themselves on these small pieces of land. [3]

[Total: 15]

- 9 (a) Mineral particles in soil are formed when rocks are broken down.

Describe the ways in which rocks are broken down. [10]

- (b) Humus, air, water and soil organisms are all part of the soil.

Outline the importance of **each** of these to the growth of plants. [5]

[Total: 15]

- 10 (a) For a type of farm livestock that you have studied:

- (i) state the type of livestock;
 (ii) name the main product for which the livestock is kept;
 (iii) describe the way in which this product is processed and stored. [5]

- (b) Describe the conditions that should be provided by livestock housing. [6]

- (c) Describe the importance of:

- (i) quarantine for newly imported stock;
 (ii) isolation for animals that may be sick. [4]

[Total: 15]

11 Water is needed for human and livestock consumption, for washing machinery and livestock housing and for irrigation.

(a) (i) List **three** sources of water that may be available on a farm. [3]

(ii) For each source of water that you have listed, state a use that it is suitable for, giving reasons for your answer. [6]

(b) Describe **one** way in which a farmer can collect and store water.

Explain the importance of water storage and conservation. [6]

[Total: 15]

12 Outline the processes and importance, in plants, of:

(a) photosynthesis;

(b) transpiration;

(c) translocation. [15]

[Total: 15]

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