

GENERAL CERTIFICATE OF SECONDARY EDUCATION
ENVIRONMENTAL AND LAND-BASED SCIENCE
Plant Cultivation (Foundation Tier)

B491/01

Candidates answer on the question paper.

OCR supplied materials:

None

Other materials required:

- Electronic calculator
- Pencil
- Ruler (cm/mm)

Tuesday 28 June 2011
Morning

Duration: 45 minutes



Candidate forename		Candidate surname	
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Centre number						Candidate number				
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INSTRUCTIONS TO CANDIDATES

- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).
- Answer **all** the questions.
- Do **not** write in the bar codes.

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [] at the end of each question or part question.
- The total number of marks for this paper is **36**.
- This document consists of **16** pages. Any blank pages are indicated.

Answer **all** the questions.

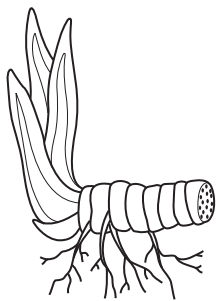
1 Garden tools have different uses.

Draw a straight line to join each **garden tool** to its correct **use**.

garden tool	use
hoe	digging up potatoes
garden fork	removing small, annual weeds
spade	double digging

[2]

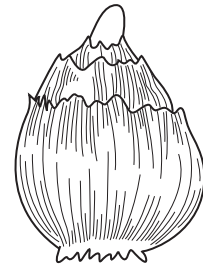
2 The diagrams show three methods of asexual reproduction.



A



B



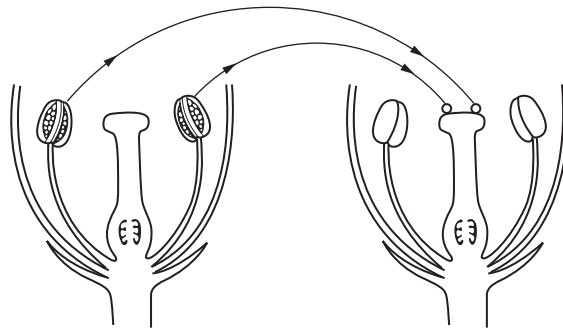
C

Complete the table below by putting **A**, **B** or **C** in the correct box.

bulb	rhizome	runner

[2]

3 The diagram shows pollination in a flowering plant.



Which **one** of the following statements about pollination is correct?

Put a tick (✓) in the box next to the correct statement.

Pollen is transferred from:

the stigma of one flower to the anther of another flower of the same species

the anther of one flower to the stigma of another flower of the same species

the stigma of one flower to the anther of another flower of a different species

the anther of one flower to the stigma of another flower of a different species

[1]

4 There can be hazards when working in a garden.

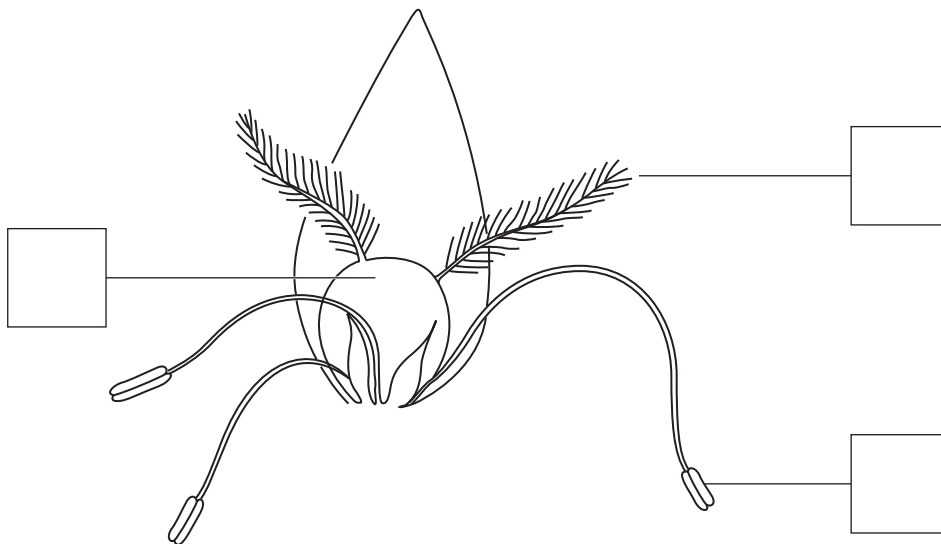
Draw a straight line from each **hazard** to its **best solution**.

hazard	best solution
spraying pesticide	use a wheelbarrow
carrying a garden fork	wear goggles and a mask
moving a heavy bag of compost	point it downwards
working in a glasshouse	remove any trip hazards

[3]

5 Grasses are wind-pollinated.

The diagram shows a grass flower.



(a) Place a letter **A** in the box to label the **anthers**.

[1]

(b) Grass flowers produce a large amount of pollen.
Explain why.

.....

..... [1]

6 Some students carried out an experiment.

They each took two plants with different characteristics then bred them together.

The results are shown in the table below.

parent 1	parent 2	results of breeding
wrinkled seed	round seed	round seed
green stem	purple stem	green stem
red flower	white flower	pink flower

(a) Put a **ring** around the correct answer.

The gene for **round seed** is

dominant recessive strong weak

[1]

(b) Explain what is meant by the F1 generation.

Use an example from the table in your answer.

.....

.....

.....

..... [2]

7 Some students were investigating the germination of clover seeds.

The students wanted to find out the effect of watering the seeds with tea.

	clover		
	number of seeds sown	number of seeds which germinated	% germination
water	97	44	45
tea	77	11	(a)

(a) Complete the table to show the percentage (%) germination when the seeds were watered with tea.

Give your answer to the nearest whole number.

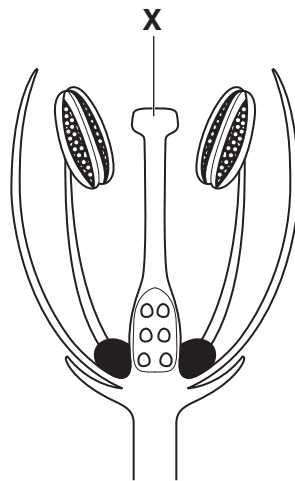
Answer% [1]

(b) The tea contains a chemical called tannin.

Write a possible conclusion for this experiment.

.....
 [1]

8 The diagram shows a cross-section of a flower.



The structure labelled **X** has been damaged.

Give **two** effects this will have on reproduction in this plant.

.....

.....

.....

..... [2]

- 9 The table shows the effect of adding different nutrients to potato and wheat crops.

plot	fertiliser added (kg/hectare)			crop yield (tonnes/hectare)	
	N	P	K	wheat	potatoes
A	0	0	0	1.7	9.5
B	96	0	0	3.7	8.3
C	0	77	107	2.0	16.7
D	96	77	107	6.6	38.6

- (a) Which plot, **A**, **B**, **C** or **D**, was used as a control?

Explain your answer.

plot

explanation

..... [2]

(b) From the results shown in the table, which nutrient, when present on its own, reduces the yield of potatoes in this experiment?

Choose from **N**, **P** or **K**.

.....

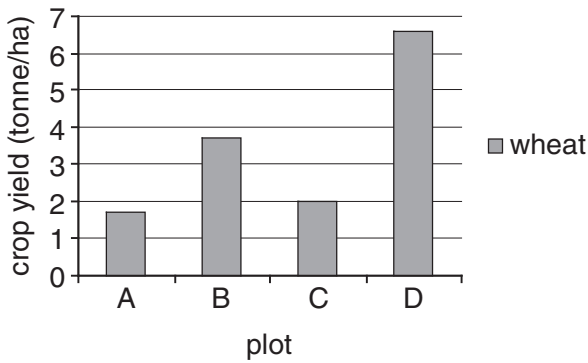
[1]

(c) The bar charts below show the wheat yield in the four plots.

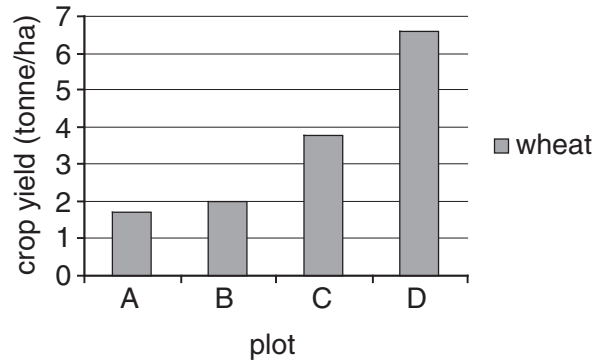
Which one is correct?

Put a tick (✓) in the box above the correct bar chart.

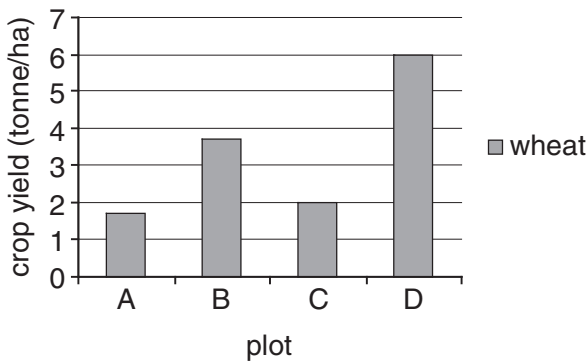
1



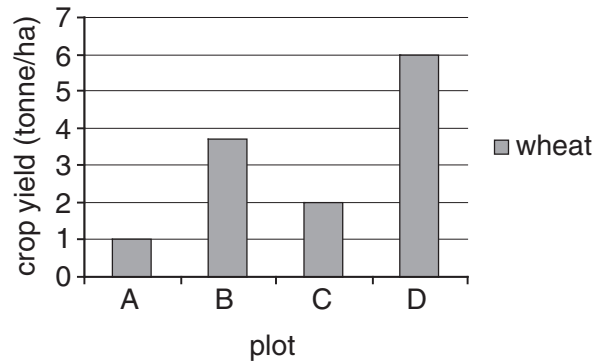
2



3



4



[1]

10 (a) The photograph shows some soil being cultivated using a chain harrow.



What does a chain harrow do?

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

(b) The photograph shows Samantha on her allotment.



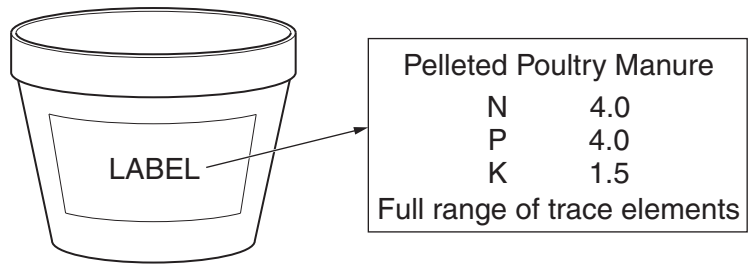
The allotment is too small for Samantha to use a chain harrow.

Which garden tool would you suggest she uses instead?

..... [1]

11 The diagram shows a container containing pellets of poultry manure.

This is used as an **organic** fertiliser.



(a) What is meant by an **organic** fertiliser?

.....
 [1]

(b) Samantha wants to apply some of this fertiliser to her allotment.

She buys it from the local garden centre because it is cheap and readily available.

State **two** other reasons why Samantha should use **this** organic fertiliser rather than an inorganic fertiliser.

1

.....

2

..... [2]

(c) Samantha buys a packet of bean seeds.

Samantha can sow the seeds indoors in April or outside in May.

She sows the seeds indoors in April.

Suggest why.

.....
 [1]

12 Here is a way of storing wheat seeds.

What you need

1. Plastic bucket with lid.
2. Oxygen absorber packet.

What you do

1. Make sure the bucket is clean and **dry**.
2. Put one **oxygen absorber packet** into the bucket.
3. Add the wheat seeds and put the lid on.

Explain why this method will keep the wheat seeds fresh.

In your answer include:

- why the bucket must be **dry and cold**
- why **oxygen** is removed
- why the bucket is stored **off the floor**.

.....

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.....

.....

.....

.....

.....

.....

[3]

13 The photograph shows a greenhouse.



Conditions in this greenhouse can be controlled to keep plants healthy.

Two of the conditions are water and nutrients.

Write about **three** other conditions that are needed to keep plants healthy.

.....

.....

.....

.....

.....

.....

..... [3]

14 Plants need water and fertiliser to produce a good yield.

Many gardeners dissolve fertiliser in a watering can so that they can water and feed their plants at the same time.

Write about **two** other ways that plants can be provided with the correct levels of water and fertiliser.

You may write about garden plants or field crops in your answer.

.....

.....

.....

.....

.....

.....

..... [3]

END OF QUESTION PAPER

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