

**GENERAL CERTIFICATE OF SECONDARY EDUCATION  
ENVIRONMENTAL AND LAND-BASED SCIENCE**

**B491/01**

Plant Cultivation  
(Foundation Tier)

**Thursday 15 January 2009  
Afternoon**

**Duration: 45 minutes**

Candidates answer on the question paper  
A calculator may be used for this paper

**OCR Supplied Materials:**  
None

**Other Materials Required:**

- Pencil
- Ruler (cm/mm)



Candidate Forename		Candidate Surname	
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Centre Number						Candidate Number				
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**INSTRUCTIONS TO CANDIDATES**

- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- Write your answer to each question in the space provided, however additional paper may be used if necessary.
- There are no separate marks for the quality of written communication, but make sure that your answers are written in clear and well-structured English.

**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.

FOR EXAMINER'S USE		
		Mark
<b>TOTAL</b>	<b>36</b>	

Answer **all** the questions.

1 Some activities carried out in the garden are listed below.

**applying granular fertiliser**

**digging and raking the soil**

**lifting a heavy plant**

**picking tomatoes**

**re-potting a geranium plant**

**spraying pesticide**

Select the appropriate activity from the list to match the safety measure and complete the table below.

activity	safety measure
<p>.....</p> <p>.....</p>	<p>wear goggles</p>
<p>.....</p> <p>.....</p>	<p>bend knees</p>
<p>.....</p> <p>.....</p>	<p>put away garden tools after use to avoid accidents</p>

[3]

2 The photograph shows a healthy plant.



© OCR

The plant has been grown in a glasshouse.

Which of the following is likely to be **absent** in this glasshouse?

- A light
- B nutrients
- C pests
- D water

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

- 3 The photograph shows some potatoes that are to be stored.



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Complete the following sentences about potatoes. Put a **ring** around the correct word.

When storing potatoes, it is important to prevent them being attacked by **pests** such as

**dry rot**      **mice**      **wilt**      **bacteria**

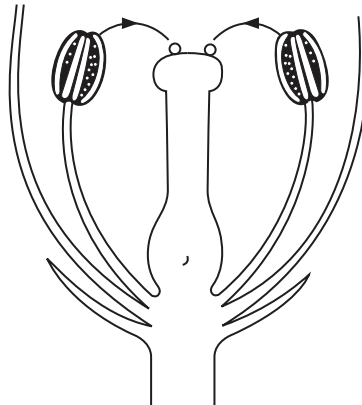
Stored potatoes must be kept free from **diseases** such as

**dry rot**      **mice**      **worms**      **slugs**

[2]

- 4 Flowers can be self-pollinated.

This process is shown in the diagram.



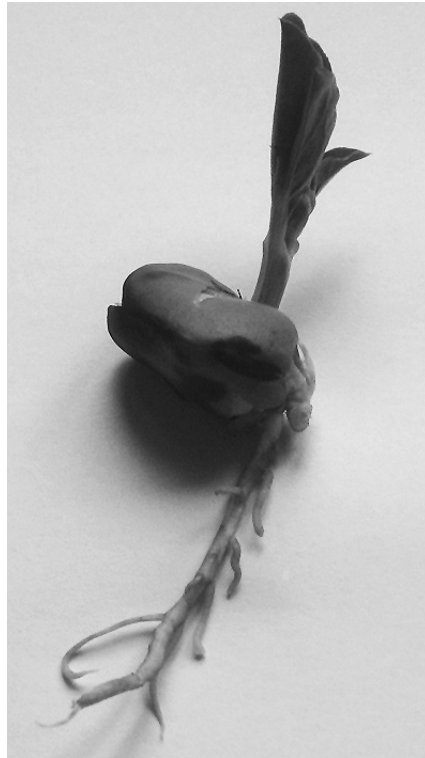
Which of the statements **best** describes self-pollination in this diagram?

- A Pollen is transferred from the anther of one flower to the stigma of the same flower.
- B Pollen is transferred from the anther of one flower to the stigma of a different flower.
- C Pollen is transferred from the stigma of one flower to the anther of the same flower.
- D Pollen is transferred from the stigma of one flower to the anther of a different flower.

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

5

5 The photograph shows a germinating seed.



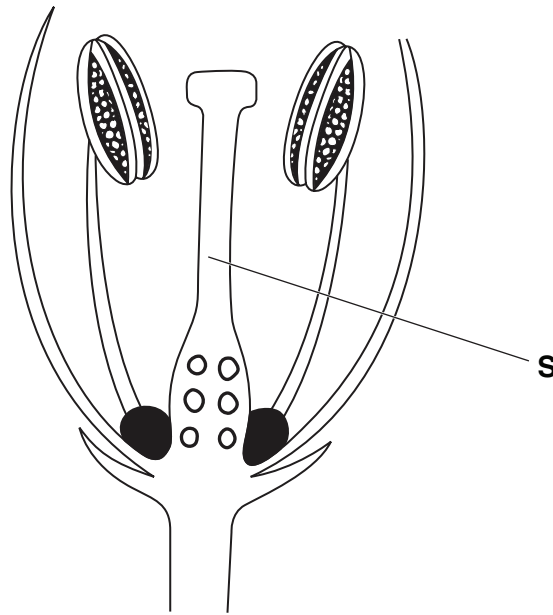
© OCR

On the photograph above, label the plumule with a **P** and label the radicle with an **R**.

Make sure your labels can be clearly seen.

[2]

6 (a) The diagram shows a flower.



The structure labelled **S** is the:

- A sepal
- B stamen
- C stigma
- D style

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

(b) What is the function of the structure labelled **S**?

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

## 7 (a) Crops can be grown in glasshouses.

The table shows when different crops are grown.

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept
cucumbers									
strawberries									
tomatoes									
melons									
peppers									

months that crops  
are grown



Which crop has the shortest growing period? Put a **ring** around the correct answer from the list below.

**cucumbers**

**strawberries**

**tomatoes**

**melons**

**peppers**

[1]

(b) It is expensive for the grower to heat the glasshouse over winter.

Which crop will be the most expensive?

..... [1]

8 The photographs show an inorganic fertiliser and farmyard manure.



© OCR

inorganic fertiliser



© OCR

well rotted farmyard manure

State **two** facts about organic fertilisers, such as farmyard manure, that are **not** true of inorganic fertilisers.

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



9 The photograph shows an organ of vegetative propagation (asexual reproduction).



© OCR

(a) Name the organ of vegetative propagation shown.

..... [1]

(b) Name a **crop plant** that has such a structure.

..... [1]

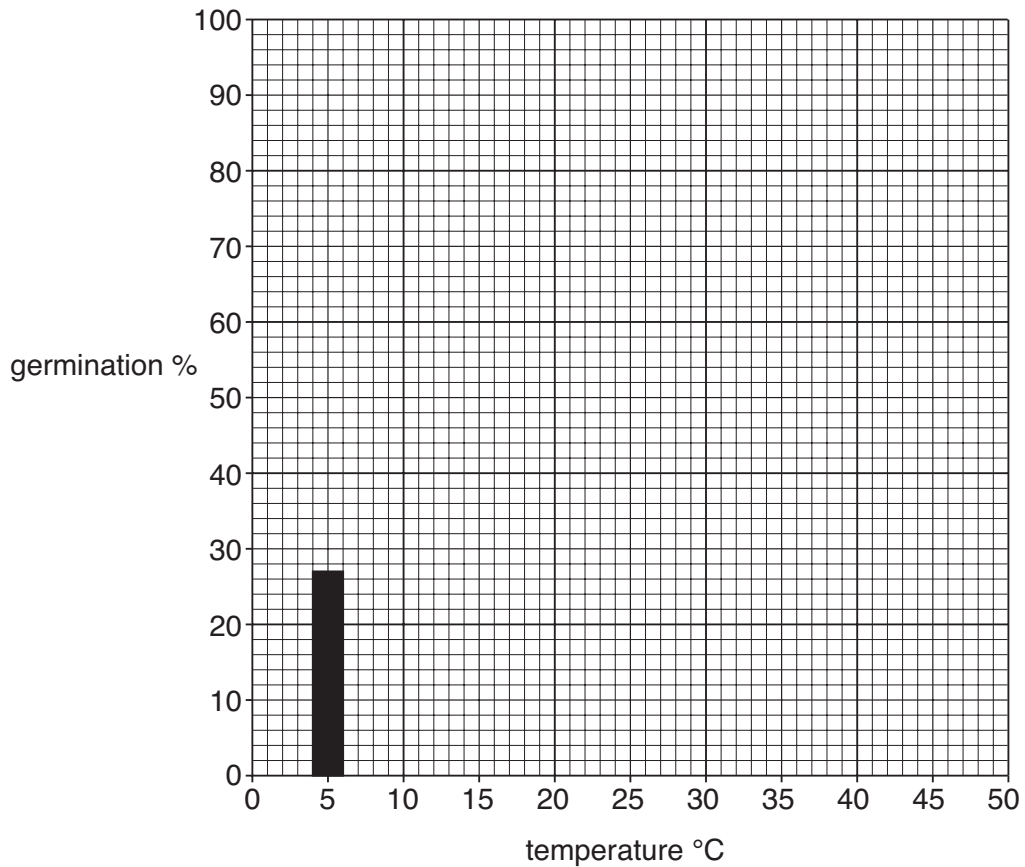
10

- 10 (a) Justine investigates the germination of cabbage seeds. She does the experiment at different temperatures. She calculates percentage germination.

The results are shown below.

temperature °C	germination %
0	0
5	27
10	78
15	93
20	15
25	99
30	0
35	0
40	0

Complete the bar chart to show these results.



[2]

(b) One of the results is anomalous (strange).

(i) At which temperature is the anomalous result?

..... [1]

(ii) Suggest **one** reason for this anomalous result.

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

(c) Gardeners rarely germinate seeds in soil temperatures of 25 °C. Give **one** reason for this.

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

11 The photograph shows a garden tool.



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(a) State **one** hazard of using this tool in the garden.

..... [1]

(b) How could this hazard be avoided?

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

12 Sarah has two pure breeding plants.

One has white flowers and one has red flowers.

The photograph shows the result of crossing these two plants.



red flowers

© OCR

What conclusion can Sarah make about the gene for flower colour? Explain your answer.

.....

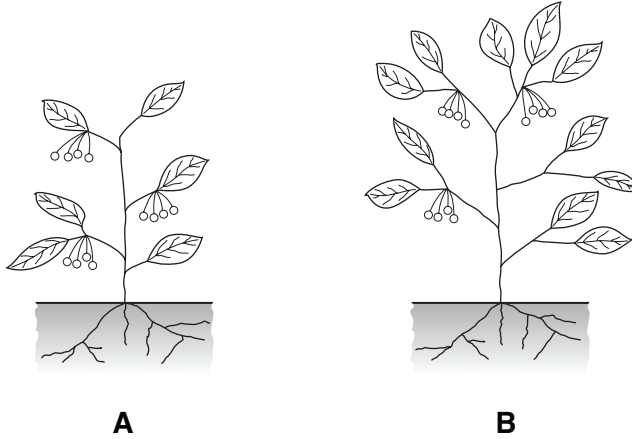
.....

..... [2]

13 Plants need nutrients to grow properly.

Nitrate provides nitrogen (N) for leaf and shoot growth.  
Phosphate provides phosphorous (P) for root growth.  
Potassium provides potassium (K) for fruits and flowers.

The diagram shows two plants **A** and **B**.



Which nutrient is plant **A** lacking?

..... [1]

14 Seeds can be collected from plants growing in the garden.

The instructions for collecting these seeds are as follows

- Choose a **disease-free** plant.
- Wait until the seeds are ripe then **collect them straight away**.
- Collect seeds on a **dry day**.

Give an explanation for each of the instructions in bold.

.....  
.....  
.....  
.....  
.....  
.....  
..... [3]

15 The photograph shows seedlings growing.



© OCR

Describe how you would grow a crop such as tomatoes from seed, indoors.

.....

.....

.....

.....

.....

..... [3]

16 The photograph shows a large field.



© OCR

Describe how the field can be cultivated by machines.

.....

.....

.....

.....

.....

..... [3]

**END OF QUESTION PAPER**

**PLEASE DO NOT WRITE ON THIS PAGE**



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