

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

**B491/01**

Plant Cultivation (Foundation Tier)

**FRIDAY 23 MAY 2008**

Afternoon  
 Time: 45 minutes

Candidates answer on the question paper  
**Additional materials (enclosed):** None

**Additional materials (required):**  
 Pencil  
 Ruler (cm/mm)  
 Calculator



Candidate Forename

Candidate Surname

Centre Number

Candidate Number

**INSTRUCTIONS TO CANDIDATES**

- Write your name in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use blue or 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.

**INFORMATION FOR CANDIDATES**

- The number of marks for each question is given in brackets [ ] at the end of each question or part question.
- The total number of marks for this paper is **36**.

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

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

Answer **all** the questions.

- 1 The photograph shows some carrots that need to be stored.



J North/ © OCR

Sometimes vegetables have to be kept for a long time.

Which conditions should be used to extend storage life?

- A cool and dry
- B cool and moist
- C warm and dry
- D warm and moist

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

2 The photograph shows seeds being sown.



J North/ © OCR

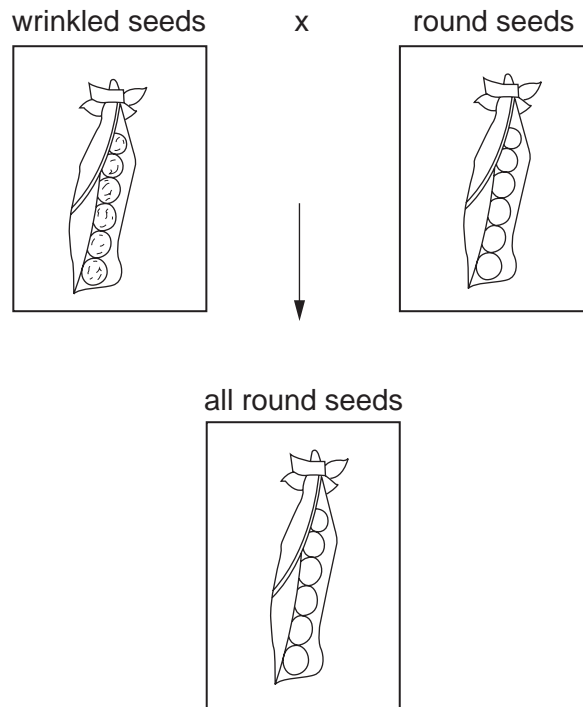
Complete the following sentences to explain how it was done. Put a **(ring)** around the correct ending in each case.

Seeds are sown in a tray containing **soil peat manure compost**.

The tray is watered and placed in a glasshouse.

The best temperature for the seeds to germinate is **0°C 10°C 20°C 30°C**. [2]

- 3 The diagram shows the result of crossing pea plants that have different shapes of seeds.



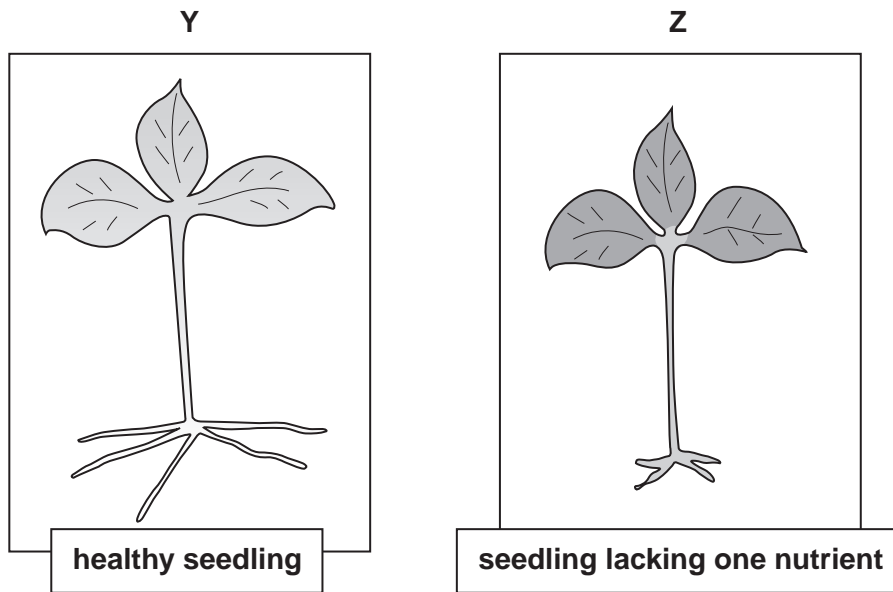
The shape of pea seeds is controlled by genes.

Which term describes the gene for **round** seeds?

- A co-dominant
- B dominant
- C recessive
- D the F1 generation

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

4 The diagrams show two seedlings, **Y** and **Z**.



Which **one** nutrient is seedling **Z** lacking?

- A C
- B K
- C N
- D P

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

5 To keep a plant healthy it must be grown in the correct conditions.

The boxes contain some of the conditions needed to keep a plant healthy.

warmth

light

soil

oxygen

water

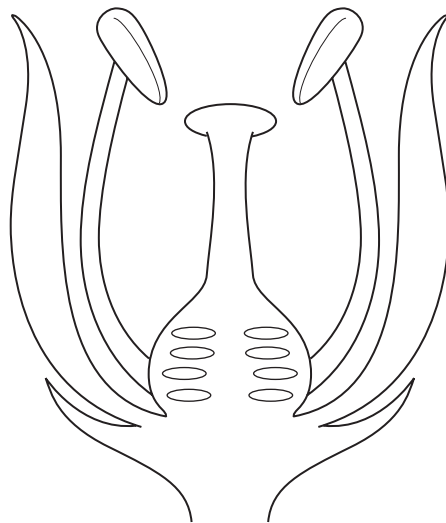
fertiliser

Complete the table below, using words from the boxes.

condition	.....	.....	.....
why is this needed?	to stop plant wilting	for photosynthesis	for enzymes to work quickly

[3]

6 The diagram shows a flower which is pollinated by insects.



Place the letter **P** on the diagram to show where pollen is produced.

[1]

Place the letter **F** on the diagram to show where fertilisation takes place.

[1]

7 The diagram shows soil being cultivated by hand.



(a) The grower would like to grow an organic crop.

What material could be added to the trench to improve the soil?

.....[1]

(b) This technique is called single digging.

State **two** ways in which this method of digging improves the soil.

1.....[1]

2.....[1]

(c) Before sowing any seeds, the grower will rake the soil.

Give **one** reason for doing this.

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

8 The photograph shows a flower which is pollinated by **insects**.



J North/ © OCR

(a) A flower pollinated by the **wind** looks very different.

Describe **two** ways in which the **appearance** of a wind pollinated flower is different.

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

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

(b) In summer, some people suffer from hay fever.

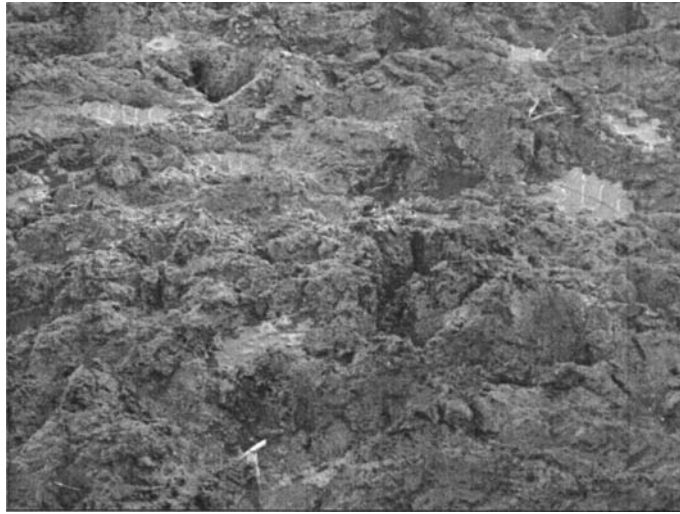
Flowers which are pollinated by wind are more likely to cause hay fever than flowers pollinated by insects.

Explain the reason for this.

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



9 The photograph shows a waterlogged field.



J North/© OCR

Suggest **two** reasons why seeds do not germinate well in a waterlogged soil.

1 .....[1]

2 .....[1]

10 A student planted a single broad bean seed in each of twelve plant pots.

The seeds were planted at the same depth.

Six of the pots had the holes at the bottom sealed.

The pots were kept in a glasshouse and watered daily.

After three weeks the dry mass of each bean plant was measured.

plant pot number	dry mass (kg)
1	0.00
2	0.15
3	0.13
4	0.00
5	0.19
6	0.00
7	0.10
8	0.00
9	0.00
10	0.12
11	0.08
12	0.00

(a) Which **six** seeds did not germinate?

Plant pot numbers: ..... [1]

(b) Use the information above to suggest why six of the seeds did not germinate.

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

(c) The student was carrying out an experiment on seed germination.

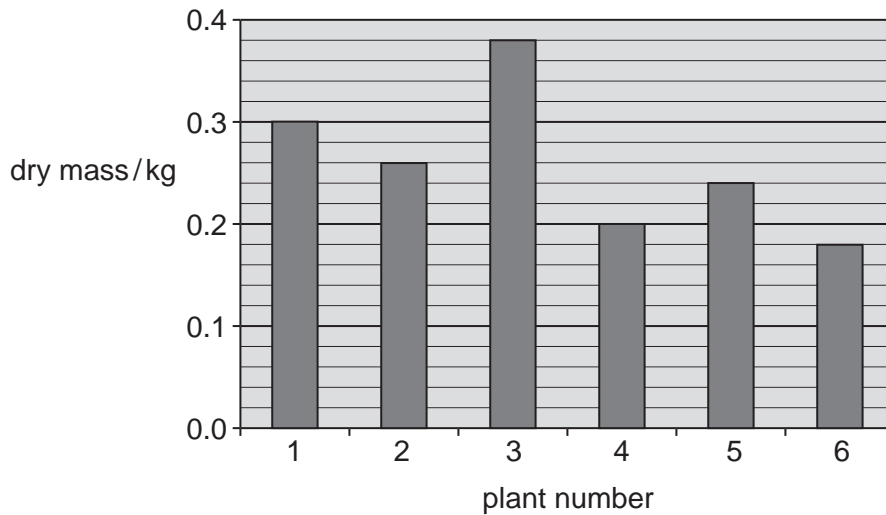
Why were twelve plants used rather than two?

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

(d) Suggest **one** reason for the differences in the dry masses of the living plants.

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

11 The bar chart shows the growth of bean plants after six weeks.



This table of results was used to draw the bar chart.

plant number	dry mass (kg)
1	0.30
2	0.26
3	0.38
4	0.20
5	0.24
6	0.18

(a) What is the difference in dry mass between the biggest and smallest bean plant?

..... [1]

(b) What is the average dry mass of the six bean plants?

- A 0.30 kg
- B 0.28 kg
- C 0.26 kg
- D 0.24 kg
- E 0.22 kg

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

12 The photograph shows a bulb.



J North/© OCR

Bulbs reproduce by asexual reproduction.

Describe how a bulb propagates (produces more bulbs).

.....

.....

.....

.....[2]

13 The photograph shows a container of an inorganic fertiliser rich in potassium (K).



J North/ © OCR

This fertiliser will affect plant growth and development.

Describe **one** of these effects.

.....

.....[1]

14 The photograph shows land being cultivated using a plough.



J North/ © OCR

State **one** advantage and **one** disadvantage of using a plough rather than cultivating by hand.

advantage .....

.....[1]

disadvantage .....

.....[1]

15 The photograph shows an **organic** fertiliser.



J North/ © OCR

Farmers can add **organic** or **inorganic** fertilisers to their soil.

Some farmers prefer to use only organic fertilisers. Explain why.

.....

.....

.....

.....

.....[3]

16 The photograph shows a glasshouse.



J North/ © OCR

A grower wants to clean the roof of this glasshouse.

He wants to climb up a ladder and use a wet sponge.

Explain why this is dangerous and suggest an alternative method.

.....

.....

.....

.....[2]

**END OF QUESTION PAPER**

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