

Thursday 26 January 2012 – Morning

GCSE ENVIRONMENTAL AND LAND-BASED SCIENCE

B491/03 Plant Cultivation (Foundation Tier)

Candidates answer on the Question Paper.
A calculator may be used for this paper.

Duration: 45 minutes

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, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. HB pencil may be used for graphs and diagrams only.
- Answer **all** the questions.
- 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).
- Do **not** write in the bar codes.

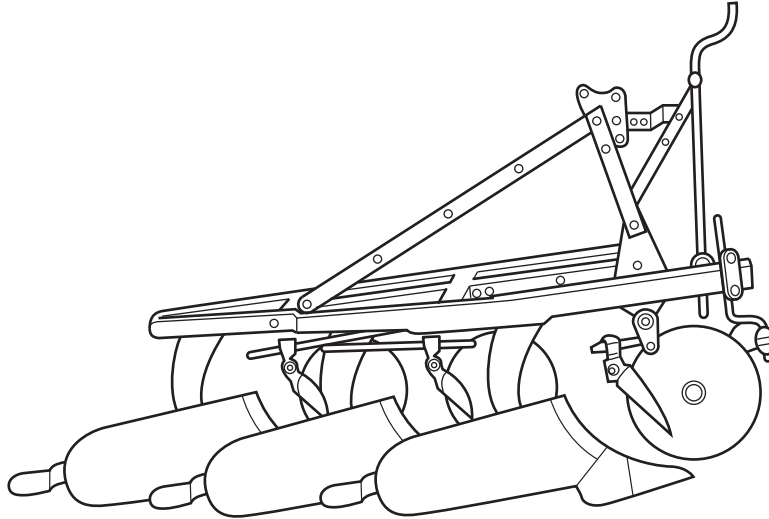
INFORMATION FOR CANDIDATES

- 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 **20** pages. Any blank pages are indicated.

For Examiner's Use	
TOTAL	

Answer **all** the questions.

1 Farmers can use this equipment to cultivate their fields.



(a) Name the equipment shown.

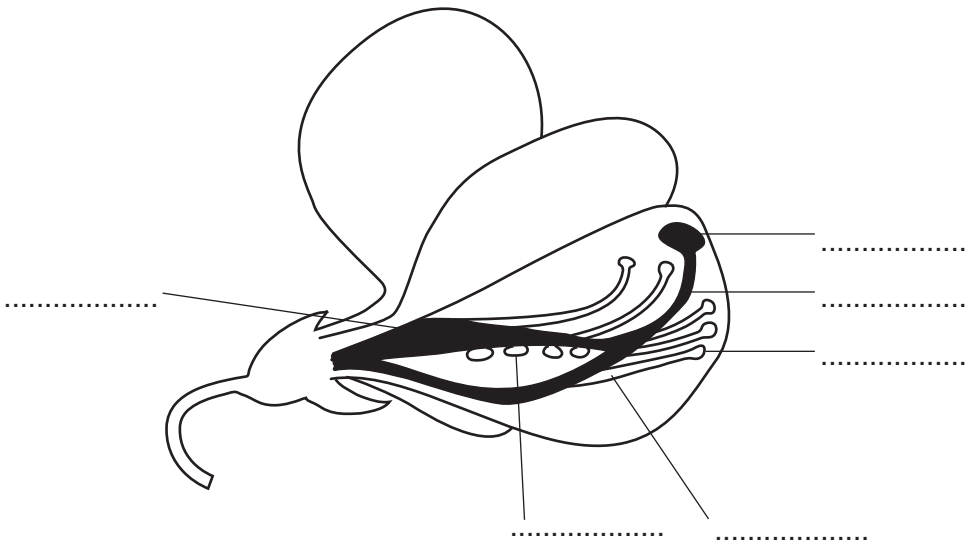
..... [1]

(b) Which **garden tool** does the same job?

- A fork
- B hoe
- C rake
- D spade

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

2 The diagram shows a cross-section through a pea flower.



(a) Write an **S** on the label line that points to the **stigma**. [1]

Write an **O** on the label line that points to the **ovule**. [1]

(b) Is this flower pollinated by wind or by insects?

Give a reason for your answer.

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

3 Imogen crossed two tall pea plants.

She planted the seeds produced.

The plants grew.

$\frac{3}{4}$ of the plants were **tall**.

$\frac{1}{4}$ of the plants were **short**.

The gene for tall growth in peas is:

A dominant

B recessive

C stronger

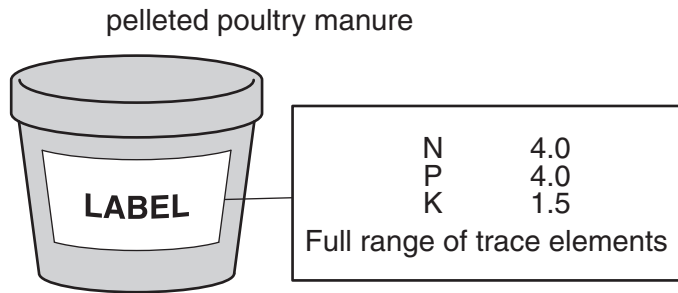
D weaker

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

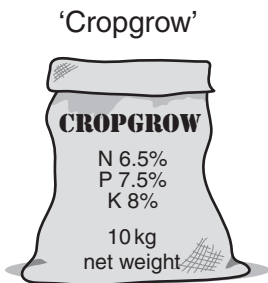
4 The diagrams show four different types of fertiliser.



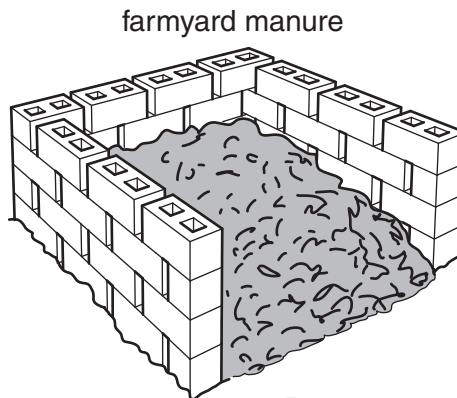
A



B



C



D

Which fertiliser is **inorganic**?

Answer A, B, C or D [1]

5 Patrick digs farmyard manure into the soil.

This releases nutrients.

State **one** other reason for adding the manure.

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

6 The diagram shows a bag of fertiliser.



How much phosphate (P) would there be in 50 kg of this fertiliser?

.....kg [1]

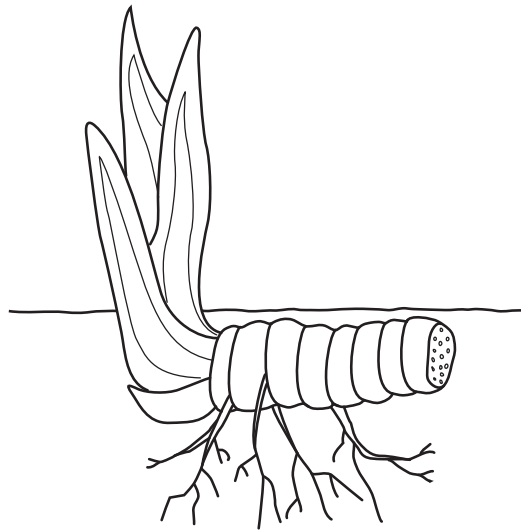
7 Some plants may lack nitrogen (N).

Which of the following statements describes the appearance of a plant short of nitrogen (N)?

- A green leaves and tall spindly stem
- B leaves with dead spots and few fruits and flowers
- C purple leaves and small roots
- D yellow leaves and stunted growth

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

8 The diagram shows an organ of vegetative propagation (asexual reproduction).



What is the name of this type of organ?

- A bulb
- B flower
- C rhizome
- D runner

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

9 The diagrams show people involved in gardening.



A young person listening to a walkman whilst gardening



B two children messing about in a greenhouse



C a gardener spraying pesticide in a greenhouse without personal protective equipment, PPE



D a student lifting a heavy object without bending his knees

For each activity, **A**, **B**, **C**, **D**, suggest why it is dangerous.

A

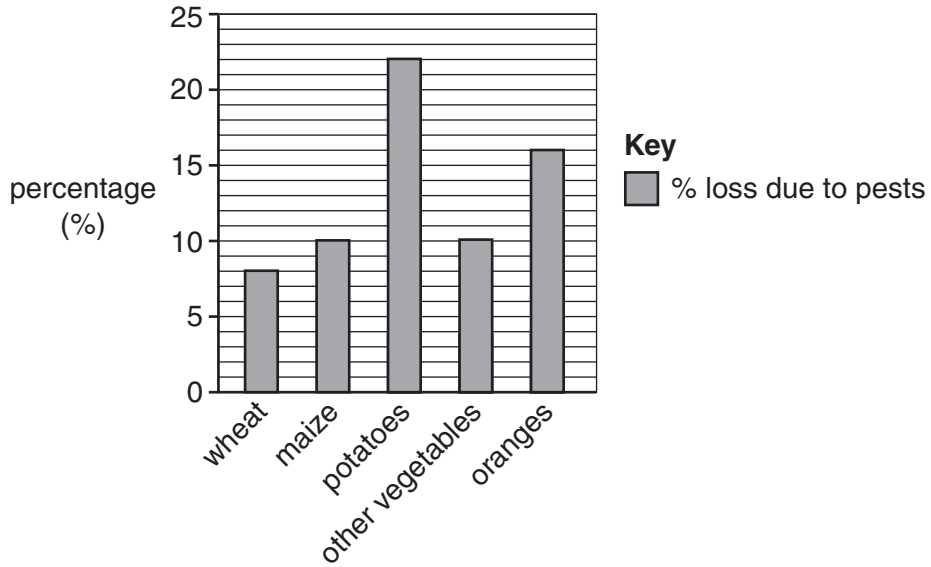
B

C

D [4]

10 Pests can reduce the yield of crops.

The chart shows the percentage loss for some crops.



(a) Which **two** groups of plants show the same percentage loss?

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

(b) What is the difference between the largest and the smallest percentage loss?
Show your working.

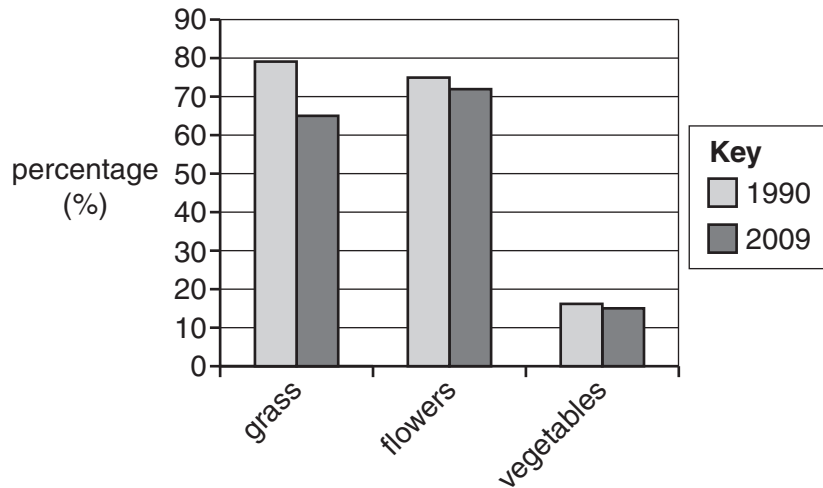
..... [1]

11 Samantha wants to store some apples she has picked.

Suggest **one** way she can store the apples to prevent pest damage.

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

12 The graph shows the percentage of gardens that grew grass, flowers and vegetables in 1990 and 2009.





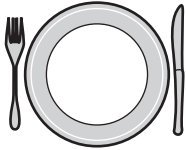
Which **one** of grass, flowers or vegetables shows the greatest decrease between 1990 and 2009?

..... [1]

13 Many gardeners enjoy growing vegetables.

The information below is found on a seed packet for growing onions.

Onion

	<p>Sow seed 1.5cm deep in rows 15-20cm apart. Thin seedlings to 5-10cm. Plant sets at the same spacing just beneath the soil surface with the tip showing.</p>	<p>Germination time 21 days</p>																																																									
	<p>Carefully remove weeds by hand. Water plants in dry weather, stopping once the bulbs have swollen. Break off any flower stems that appear.</p>	<p>Average time to harvest 20 weeks</p>																																																									
	<p>Dig up bulbs two weeks after leaves turn yellow and topple over, choosing a dry day. Leave bulbs to dry in the sun before storing.</p>																																																										
<table border="1"> <thead> <tr> <th colspan="3">Spring</th> <th colspan="4">Summer</th> <th colspan="5">Autumn/Winter</th> </tr> <tr> <th>J</th> <th>F</th> <th>M</th> <th>A</th> <th>M</th> <th>J</th> <th>J</th> <th>A</th> <th>S</th> <th>O</th> <th>N</th> <th>D</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td></td> <td></td> <td></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td></td> <td></td> </tr> </tbody> </table> <p style="text-align: center;"> Sow outdoors Plant out/transplant Harvest </p>												Spring			Summer				Autumn/Winter					J	F	M	A	M	J	J	A	S	O	N	D																								
Spring			Summer				Autumn/Winter																																																				
J	F	M	A	M	J	J	A	S	O	N	D																																																

(a) For how many months can onions be sown outdoors?
 [1]

(b) How long does it take for onion seeds to germinate?
 [1]

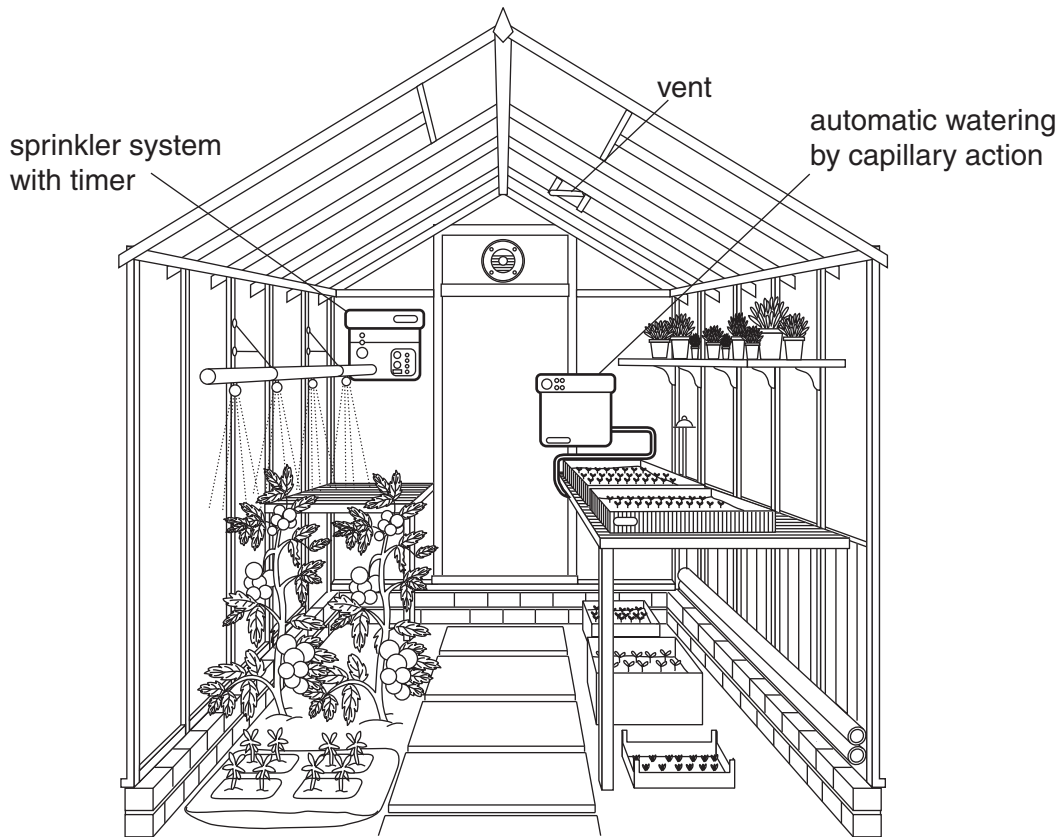
(c) The packet says 'thin seedlings to 5-10cm'.
 Explain why this is necessary.

 [1]

(d) The packet says 'dig up bulbs on a dry day and leave them to dry before storing'.
 Explain why this is important.

 [1]

14 The diagram shows a glasshouse suitable for growing plants from seed.



Closing the vents in the glasshouse would change the internal conditions.

Which **one** of the following statements about closing the vents is **correct**?

It would decrease...

- A ...air movement.
- B ...light.
- C ...rainfall.
- D ...temperature.

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

15 The humidity in a glasshouse is controlled by opening and closing the vents.

Explain how ICT can be used to control the humidity.

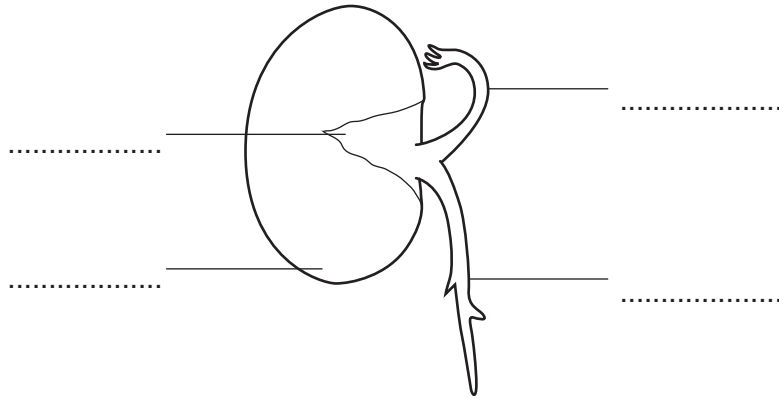
.....

.....

.....

..... [2]

16 The diagram shows a broad bean seed which is starting to germinate.



(a) Seeds will only germinate if the environmental conditions are correct.

Which **one** of the following describes the best conditions for seed germination?

- A cold and light
- B cold and dark
- C warm and dry
- D warm and moist

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

(b) Write an **R** on the label line that points to the **radicle**. [1]

17 Mary thinks seeds will only germinate if they are sown at the correct depth.

She wants to find out how deep to sow runner bean seeds.

Design an experiment you could carry out on a vegetable plot to investigate this.

In your answer include:

- how deep you would sow the seeds
- how many seeds you would sow
- how you would collect your results.

.....

.....

.....

.....

.....

..... [3]

18 The photograph shows a basket containing summer flowering plants.



Your neighbour has gone on holiday.

You have been asked to look after the plants.

Describe in detail what you would do.

.....

.....

.....

..... [2]

- 19 The photograph shows a student preparing a small vegetable plot. He has already added well-rotted farmyard manure (FYM) to the soil.



Write a list of tasks that he must now do to prepare a good seed bed.

In your list include:

- what he must do
- which tools he should use
- why he is carrying out these tasks.

.....

.....

.....

.....

..... [3]

END OF QUESTION PAPER

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