

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)

Monday 28 June 2010
Morning

Duration: 45 minutes



| | | | |
|--------------------|--|-------------------|--|
| Candidate Forename | | Candidate Surname | |
|--------------------|--|-------------------|--|

| | | | | | | | | | | |
|---------------|--|--|--|--|--|------------------|--|--|--|--|
| Centre Number | | | | | | Candidate Number | | | | |
|---------------|--|--|--|--|--|------------------|--|--|--|--|

INSTRUCTIONS TO CANDIDATES

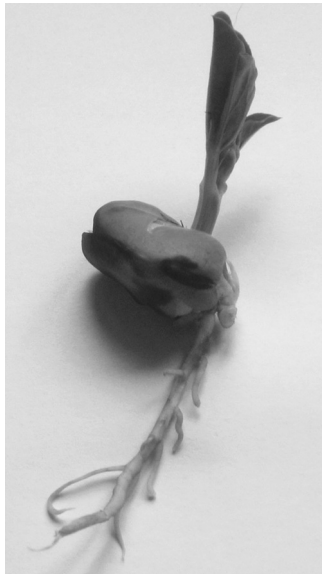
- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Answer **all** the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

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 The photograph shows a germinating broad bean seed.



Which **two** of the following do **all** seeds need in order to germinate?

- A carbon dioxide
- B cold
- C compost
- D light
- E oxygen
- F water

Answer **A, B, C, D, E** or **F** and [2]

2 The photograph shows a plant.



This plant has 28 chromosomes in each leaf cell.

How many chromosomes would it have in a pollen cell (gamete)?

- A 7
- B 14
- C 28
- D 56

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

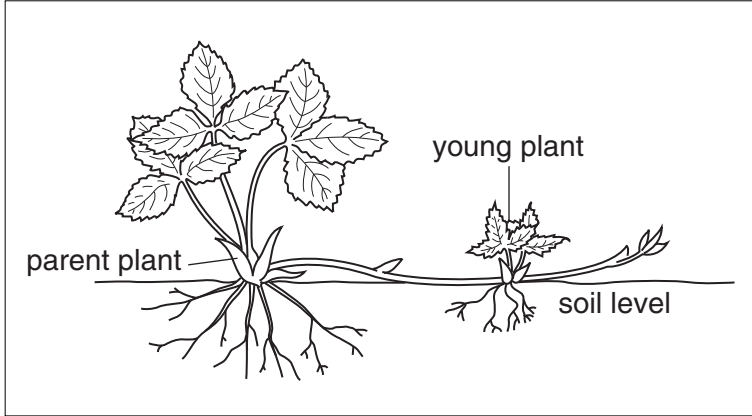
3 Some plants reproduce by vegetative propagation.

This is called asexual reproduction.

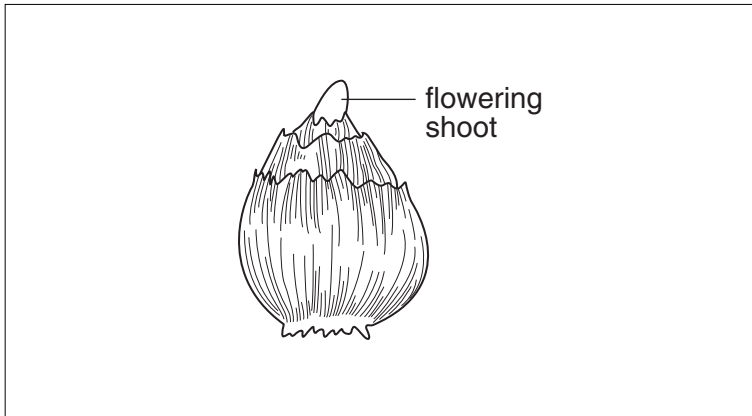
Draw a straight line to link each **plant** with its correct **method** of vegetative propagation.

plant

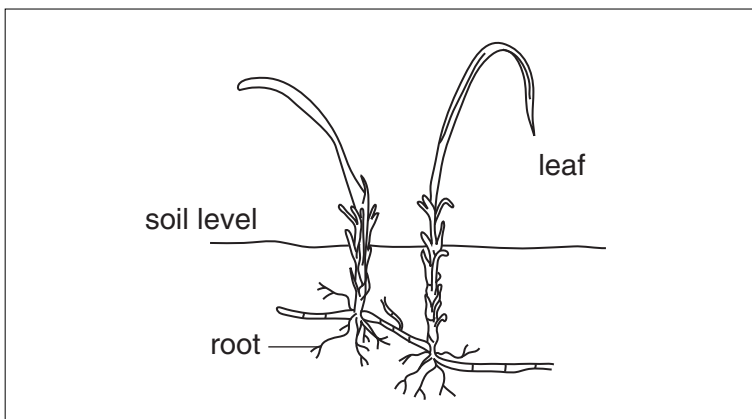
method



bulb



rhizome



runner

[2]

- 4 Different tools are needed to grow vegetables.

Put a **(ring)** around the correct tool to complete the sentences below.

To produce a trench for planting peas it is best to use a

garden fork hoe rake spade.

To weed between rows of beetroot it is best to use a

garden fork hoe rake spade.

To lift potatoes ready for eating it is best to use a

garden fork hoe rake spade.

[3]

- 5 The photograph shows part of a damaged leaf.



Which of the following is the most likely cause of the damage?

- A disease
- B lack of nutrients
- C lack of water
- D pests

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

6 Organic fertilisers can be added to the soil to improve crop growth.

Which of the following is an advantage of **organic** fertilisers?

Organic fertilisers

- A do not cause pollution.
- B contain equal quantities of NPK.
- C improve the crumb structure of the soil.
- D are easy to store and apply.

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

7 The photograph shows some carrots.



Root crops such as carrots often deteriorate during storage.

Their storage life can be extended using the correct conditions.

Suggest, with reasons, **three** conditions that would extend the storage life of the carrots.

- 1
-
- 2
-
- 3
- [3]

8 The photograph shows part of a large field of sweet corn (maize).



Louise wants to grow some sweet corn on her allotment.

A book advises her to plant the sweet corn in a square  rather than

a row .

Explain why this is necessary if she wants the flowers of the sweet corn to be pollinated.

.....

.....

.....

..... [2]

9 The photograph shows some students raking the soil of their vegetable plot.



(a) Suggest **two** reasons why they need to rake the soil.

- 1
-
- 2
- [2]


(b) State **two** hazards that can be seen from the photograph.

- 1
-
- 2
- [2]





10 The diagram shows instructions for growing runner beans.

Runner Beans 'enorma'









An established favourite that produces good yields of long, tasty, straight, smooth pods.



Young Seedling

| | | | |
|---|--------------|---|-----------|
|  | sow indoors |  | plant out |
|  | sow outdoors |  | harvest |

**80%
germination
guaranteed**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|--|---|---|
| J | F | M | A | M | J | J | A | S | O | N | D |
| | |  |  |  |  |  |  |  |  | | |

Outdoor sowing:
Sow seeds in a prepared seed bed with 12cm between each seed, in rows 45cm apart. Keep moist and weed free.

40 seeds £1.20

Runner bean seeds can be sown indoors in pots to germinate.

After they have germinated, the seedlings are planted outside.

During which month does it recommend that the seedlings are planted out?

..... [1]

11 The table shows some information about five different varieties of tomato.

| name | price £ | size | yield | for cooking | growing |
|------------------------------|------------|--------|-------|----------------|----------------------|
| Gardeners Delight | 1.89 | small | ★★★★★ | ★ | glasshouse/ patio |
| Ailsa Craig | 1.69 | medium | ★★★ | ★ | glasshouse/ patio |
| Shirley F₁ | 3.49 | medium | ★★★ | ★★ | glasshouse |
| Beefeater | 3.95 | large | ★★★★★ | ★★★ | glasshouse |
| San Marzano Lungo | 1.69 | large | ★★★★ | ★★★★★ | patio |

Key: ★ = poor ★★ = below average ★★★ = average ★★★★ = good ★★★★★ = excellent

A chef wants to start growing tomatoes for use in his restaurant.

He is hoping to use the tomatoes to make hot pasta sauce.

Which variety would you recommend?

..... [1]

12 The table shows some more information about the five different varieties of tomato.

| name | price £ | size | flavour | yield | for cooking | growing |
|------------------------------|------------|--------|---------|-------|----------------|----------------------|
| Gardeners Delight | 1.89 | small | ★★★ | ★★★★★ | ★ | glasshouse/ patio |
| Ailsa Craig | 1.69 | medium | ★★★★★ | ★★★ | ★ | glasshouse/ patio |
| Shirley F₁ | 3.49 | medium | ★★★★ | ★★★ | ★★ | glasshouse |
| Beefeater | 3.95 | large | ★★★★★ | ★★★★★ | ★★★ | glasshouse |
| San Marzano Lungo | 1.69 | large | ★★★ | ★★★★ | ★★★★★ | patio |

Key: ★ = poor ★★ = below average ★★★ = average ★★★★ = good ★★★★★ = excellent

A primary school wishes to teach its students how to grow tomatoes.

It does not have a glasshouse but would like to grow enough tomatoes for each student to take some home.

The students prefer small tomatoes.

Which variety would you recommend?

Give **three** reasons for your answer.

.....

.....

.....

..... [2]

13 A grower notices that planting carrots different distances apart has an effect on yield.

He monitors the growth of carrots and weeds.

The table shows his results.

| | | row spacing | |
|----------------------------|---------|-------------|-------|
| | | 60 cm | 30 cm |
| yield (kg/m ²) | carrots | 2.4 | 3.4 |
| | weeds | 0.8 | 0.4 |
| cover (%) | carrots | 63.4 | 90.9 |
| | weeds | 14.0 | 5.1 |

When rows are closer the carrot yield is greater.

Suggest **two** reasons for the difference in carrot yield.

Use information from the table.

1

.....

2

..... [2]

14 To be healthy a plant needs three nutrients.

Name these **three** nutrients.

1

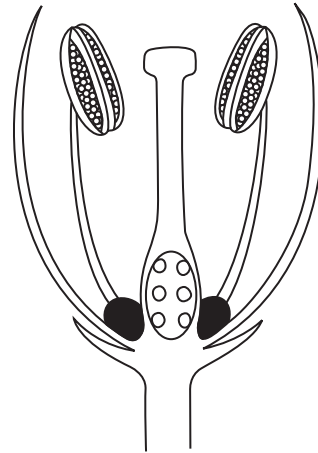
2

3 [2]

- 15 Plants can be pollinated in different ways.
Diagram **A** shows a flower pollinated by **wind**.
Diagram **B** shows a flower pollinated by **insects**.



A wind pollinated



B insect pollinated

- (a) How is the flower in diagram **A** adapted for wind pollination?

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

- (b) How is the flower in diagram **B** adapted for insect pollination?

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

16 The photograph shows the inside of a large, commercial glasshouse.



The grower uses a computer to keep records about the plants.

State **two** pieces of information, other than environmental conditions, that the grower might keep about the plants.

- 1
-
- 2
- [2]

17 Describe three signs of a healthy plant.

-
-
-
-
-
- [3]

END OF QUESTION PAPER

15
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