



R2104
UNDERSTANDING PLANT PROPAGATION

Level 2

Monday 18 June 2018

14:50 – 15:40

Written Examination

Candidate Number:

Candidate Name:

Centre Number/Name:

IMPORTANT – Please read carefully before commencing:

- i) The duration of this paper is **50** minutes;
- ii) **ALL** questions should be attempted;
- iii) **EACH** question carries **10 marks**;
- iv) Write your answers legibly in the lined space provided. It is **NOT** necessary that all lined space is used in answering the questions;
- v) Use **METRIC** measurements only;
- vi) Use black or blue ink only. Pencil can be used for drawing purposes only;
- vii) Where plant names are required, they should include genus, species and where appropriate, cultivar;
- viii) Where a question requires a specific number of answers; only the first answers given that meet the question requirement will be accepted, regardless of the number of answers offered;
- ix) Please note, when the word '**distinct**' is used within a question, it means that the items have different characteristics or features.

ANSWER ALL QUESTIONS

Q1 Describe how **EACH** of the following environmental requirements can be provided for germinating seeds in a protected structure, by completing the table below.

MARKS

Requirements	Provision of environments
Moisture	
Temperature	
Oxygen	
Light	
Dark	

2

2

2

2

2

Total Mark

Please see over/.....

MARKS

Q2 a) Name **ONE** hardy annual plant grown outdoors.

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b) Describe the propagation of hardy annual plants grown outdoors under the following headings:

- i) time of year;
- ii) preparation of the seed bed (secondary cultivation);
- iii) sowing technique.

1
4
4

i)

ii)

iii)

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Total Mark

Please turn over/.....

MARKS

Q3 a) Describe how plants naturally propagate themselves by completing the table below.

Plant example	Method of natural propagation
Bulb	
Corm	
Rhizome	
Stolon	
Stem tuber	

2**2****2****2****2**

Total Mark

Please see over/.....

MARKS

Q4 a) Name **ONE** plant propagated by means of the following:

- i) vertical root cutting;
- ii) horizontal root cutting.

1
1

i).....

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ii).....

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b) Describe the propagation of vertical root cuttings under the following headings:

- i) collection;
- ii) preparation;
- iii) immediate aftercare.

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3
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i).....

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Total Mark

Please turn over/.....

MARKS

Q5 Describe the propagation of a plant by simple layering under the following headings:

- i) name of plant;
- ii) time of year;
- iii) selection of material;
- iv) process of propagation.

1
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2
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Total Mark

Please see over/.....

Q6 a) Name **ONE** distinct plant and month of sowing for **EACH** of the following methods by completing the table below:

Sowing method	Plant name	Month(s) of sowing
Sown in 10mm deep drills		
Sown individually in 50mm deep drills		
Station sown 3 seeds		
Sown in 40mm deep trench		

2

2

2

2

b) Describe the aftercare from sowing until a month after germination for **ONE** of the seeds named above.

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Total Mark

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Sharing the best in Gardening

R2104

UNDERSTANDING PLANT PROPAGATION

Level 2

Monday 18 June 2018

Candidates Registered	674		Total Candidates Passed	483	85%
Candidates Entered	567	84%	Passed with Commendation	257	45%
Candidates Absent/Withdrawn	101	15%	Passed	226	40%
Candidates Deferred	6	1%	Failed	84	15%

Senior Examiner's Comments:

- 1** Candidates should be able to demonstrate a good range of plant knowledge and be able to give accurately named plant examples where appropriate. Common names and generic names are often too vague and cannot be rewarded in the positive manner that genus, species and where appropriate, variety/cultivar can. This is particularly important when answering questions relating to particular (named) plant(s). Marks can only be awarded for these narratives where the example(s) are correctly and fully identified.
- 2** Candidates must be able to display accurate knowledge of the technical terms and concepts detailed in the syllabus, in the context of horticulture and also be aware that wider interpretation will not be rewarded. The examination should be regarded as a possible introduction to higher level studies, which will only be open to those who are in possession of a clear understanding of the horticultural terms and concepts which are current.
- 3** The introductory rubric given on the first page of each question paper should be read carefully by candidates. At each examination there are a significant number of candidates who ignore or misread the instructions given and consequently may not perform as well as they could have done.

- 4** Candidates should pace themselves during each paper. The most successful candidates allow sufficient time to read the question thoroughly before answering it and also take time to read through their answers. They should take care to write as legibly as possible, so that the examiner is in no doubt about what is intended.
- 5** Candidates need to interpret key words within questions, particularly those such as 'state', 'list' and 'describe'. Questions requiring descriptions or explanations obviously require a more detailed answer than those requiring a list.
- 6** It is important to ensure that responses to questions are to the point. Candidates should bear in mind that small sketches might be used to convey information more succinctly than words.
- 7** Successful candidates ensure that their answers are focused and to the point. It is disappointing when they cannot be rewarded for their efforts because the answer is irrelevant to the particular question. Candidates should take note of the mark allocation for specific sections and allocate their time and efforts accordingly.
- 8** Diagrams can enhance an answer and where appropriate can replace detailed descriptions. They should be large, clear and well annotated, ensuring that labels are properly attached to the features they describe. Diagrams should preferably be in pencil. Colour may be used successfully but only where it is relevant to the answer.
- 9** In each examination it is clear that some candidates are ill prepared to answer papers of the type set. It is essential that candidates have the opportunity to practice questions. Ideally some papers should be answered in a time constrained situation. Appropriate feedback must, in any case be provided.

Q1 a) Describe how **EACH** of the following environmental requirements can be provided for germinating seeds in a protected structure, by completing the table below.

Requirements	Provision of environments	
Moisture		2
Temperature		2
Oxygen		2
Light		2
Dark		2

Q1a) Candidates who were able to describe how specific environmental requirements can be provided for germinating seeds in a protected structure gained full marks. Suitable answers included:

Moisture can be provided by watering, covering the container with glass, polycarbonate or polythene film. Water is stored in the organic fraction of the growing media e.g. sphagnum moss peat or bark which provide moisture to germinating seeds. Capillary matting, a sand bed or the use of a mist bench can also provide moisture.

Temperature can be provided by solar gain or from installed heating systems. Basal heat of 15-21°C can be provided from soil warming cables or hot water pipes.

Oxygen can be provided by the use of an ‘open’ textured growing media which is not compacted and avoid overwatering which would cause waterlogging of the growing media. It is also important to avoid sowing the seed too densely to prevent impeding air circulation around the seedlings.

Light can be provided by placing the seeds in an open situation with the optimum orientation of the greenhouse or by the use of artificial light. Seeds will receive light if they are not covered with growing media or are only covered with vermiculite.

Dark The amount of darkness seedlings are placed in is dependent on the thickness of the covering of growing media. Darkness can also be provided by the use of dark rooms, the control of light intensity appropriate to the types of seed and the use of closed germination cabinets.

Q2 a) Name **ONE** hardy annual plant grown outdoors.

1

b) Describe the propagation of hardy annual plants grown outdoors under the following headings:

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|------|--|----------|
| i) | time of year; | 1 |
| ii) | preparation of the seed bed (secondary cultivation); | 4 |
| iii) | sowing technique. | 4 |

Q2a) The majority of candidates were able to name a suitable hardy annual plant that is grown outdoors e.g. *Nigella damascena*, *Lathyrus odoratus*, *Helianthus annuus* and were awarded full marks.

Q2b) Marks were awarded to candidates who provided good descriptions of the propagation of hardy annual plants grown outdoors. The best answers included:

- i) **Time of Year**
Hardy annual plants can be sown in March/April or September/October

- ii) **Preparation of the seedbed**
Weeds are removed before the seed bed is raked roughly level and any large stones are removed. The seed bed is consolidated and fertiliser e.g. superphosphate at a rate of 120g/m² can be applied broadcast if required. The seed bed is raked to a fine tilth.

- iii) **Sowing Technique**
The area to be sown is marked out with sand before sowing the seed. The seed can be sown in drills 5mm deep and 70mm apart (or appropriate spacing), space sown in 5mm deep drills or broadcast by sowing in two directions. The seed can be mixed with sand to enable it to be sown thinly and evenly. The drills are covered or the seed is raked in.

Q3 a) Describe how plants naturally propagate themselves by completing the table below.

Plant example	Method of natural propagation	
Bulb		2
Corm		2
Rhizome		2
Stolon		2
Stem tuber		2

Q3a) To achieve maximum marks candidates were required to describe how plants naturally propagate themselves. Suitable answers included:

Bulb – Division of offset bulbils or bulbs produced by a lateral bud.

Corm – Division of corms produced around the side of the corm from axillary buds.

Rhizome – Division of rhizome into suitable sections.

Stolon – Shoot tip roots when it comes in contact with the soil. It roots and creates a new plant.

Stem Tuber – Potato tubers split from the parent plant in the soil and new plants are produced from ‘eyes’ on the tubers.

Q4 a) Name **ONE** plant propagated by means of the following:

- | | |
|------------------------------|----------|
| i) vertical root cutting; | 1 |
| ii) horizontal root cutting. | 1 |

b) Describe the propagation of vertical root cuttings under the following headings:

- | | |
|---------------------------|----------|
| i) collection; | 3 |
| ii) preparation; | 3 |
| iii) immediate aftercare. | 2 |

Q4a) The majority of candidates were able to name suitable examples of plants propagated from specific types of root cuttings and gained full marks. These included:

- i) *Acanthus mollis* and *Rhus typhina*
- ii) *Primula denticulata* and *Phlox paniculata*

Q4b) The best candidates described the propagation of vertical root cuttings well and were awarded full marks. Suitable answers included:

- i) **Collection**
The cuttings are collected between November and February from mature, healthy plants which are pest and disease free and true to type. The plants are carefully lifted and the soil is washed from the roots.
- ii) **Preparation**
Vertical cuttings 7-10cm in length are prepared using a sharp clean knife. The thickest roots, i.e. those that are approximately 7mm in diameter are used and the thin lateral roots are removed. Polarity of the cutting is maintained by making a horizontal cut at the top (proximal end) of the cutting and a 45° angle cut at the bottom (distal end).
- iii) **Immediate Aftercare**
A surface mulch of coarse grit is applied to the containers which can be placed in a cold frame or unheated greenhouse. The cuttings should be watered sparingly as they are prone to rot and should be monitored for pest and disease damage.

Q5 Describe the propagation of a plant by simple layering under the following headings:

- | | | |
|------|--------------------------------|----------|
| i) | <i>name of plant;</i> | 1 |
| ii) | <i>time of year;</i> | 1 |
| iii) | <i>selection of material;</i> | 2 |
| iv) | <i>process of propagation.</i> | 6 |

Q5a) Candidates who were able to describe the propagation of a plant by simple layering gained maximum marks. Acceptable answers included:

- i) **Name of Plant**
Cornus alba, Cotinus coggygia
- ii) **Time of Year**
The optimum period for layering plants is between March and June. Layering can also take place from midsummer to autumn.
- iii) **Selection of Material**
Select vigorous, healthy, current season's growth which is pliable and a known species/cultivar.
- iv) **Process of Propagation**
The soil is prepared by incorporating organic matter so that it is friable. The stem to be layered is gently bent so that it comes in contact with the soil approximately 30-40cm from the parent plant to a depth of 7-10cm. At the point of contact with the soil the stem can be wounded by girdling it or preparing a 25mm upward facing angled cut which can be treated with hormone rooting powder. The stem is kept in place by the use of wire pegs and the rest of the stem is supported in a vertical position with a bamboo cane and tied with twine.

Q6 a) Name **ONE** distinct plant and month of sowing for **EACH** of the following methods by completing the table below:

Sowing method	Plant name	Month(s) of sowing
Sown in 10mm deep drills		
Sown individually in 50mm deep drills		
Station sown 3 seeds		
Sown in 40mm deep trench		

2

2

2

2

b) Describe the aftercare from sowing until a month after germination for **ONE** of the seeds named above.

2

Q6a) Candidates who named suitable plants and the month that they are sown for specific sowing methods gained maximum marks. Acceptable answers included:

Sown in 10mm deep drills e.g. *Daucus carota*, *Lactuca sativa*, *Nigella damascena* are sown from March – June

Sown individually in 50mm deep drills – e.g. *Phaseolus coccineus*, *Pisum sativum*, *Vicia faba* are sown from April – June

Station sown 3 seeds – e.g. *Pastinaca sativa*, *Phaseolus coccineus*, *Vicia faba* are sown from March – May

Sown in 40mm deep trench – e.g. *Pisum sativum*, *Phaseolus coccineus*, *Vicia faba*

Q6b) Good descriptions of the aftercare of seeds from sowing until a month after germination were provided by most candidates who gained full marks. Suitable answers included:

- Watering
- Weed control
- Thinning
- Pest and Disease control
- Appropriate supports