Royal Horticultural Society

R2104

UNDERSTANDING PLANT PROPAGATION

Level 2

Monday 13 February 2012

14.30 – 15.10

Written Examination

Candidate Number: .....

Candidate Name: .....

Centre Number/Name: .....

IMPORTANT – Please read carefully before commencing:

i) The duration of this paper is **40 minutes**.

ii) **ALL** questions should be attempted.

iii) **EACH** question carries **10 marks**.

iv) Write your answers legibly in the spaces provided.

v) Use metric measurements only.

vi) Where plant names are required, they should include genus, species and where appropriate, cultivar.

vii) Please note, sufficient lined space is provided. It is **not** necessary that all lined space is used when answering a question.

ANSWER ALL QUESTIONS

MARKS

Q1 a) State **TWO** limitations of propagating plants by vegetative means. **2**

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b) Describe **FOUR** characteristics of plants requiring propagation by vegetative means. **8**

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Total Mark

MARKS

Q2 a) State **FOUR** environmental requirements necessary for the successful germination of seeds. **4**

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b) Describe the preparation of a container prior to sowing **FINE** seed. **6**

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Total Mark

MARKS

Q3 a) List **FOUR** types of facility used to propagate plants. **2**

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b) Describe how to manage the environmental conditions for **ONE NAMED** facility listed in a). **8**

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Total Mark

MARKS

Q4 Describe the propagation by division of:

i) **ONE NAMED** suckering shrub; **5**
ii) **ONE NAMED** fibrous-rooted herbaceous perennial. **5**

Total Mark

Please turn over/.....

MARKS

Q5 a) Describe, using a fully labelled diagram, the propagation of **ONE NAMED** plant by leaf bud cutting. **6**

b) List **FOUR** aftercare requirements necessary for successful rooting of the cutting. **4**

Total Mark

Please see over/.....

MARKS

Q6 a) Name **FOUR** examples of seeds that require cool, dry storage. **4**

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b) State the effect that cool, dry conditions have on the viability and germination potential of seeds. **4**

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c) Name **TWO** diseases commonly encountered when propagating plants from seed. **2**

Total Mark

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R2104

UNDERSTANDING PLANT PROPAGATION

Level 2

Monday 13 February 2012

Candidates Registered	1071	**Pass with Commendation**	267 (30.27%)
Candidates Entered	882	**Pass**	371 (42.06%)
Absent/Withdrawn/Deferred	189	**Fail**	277 (27.67%)
Total Candidates Passed	638 (72.33%)		

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 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, and preferably 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.

10. Candidates should be aware of the reading list of suggested books for the RHS Level 2 Certificate in The Principles of Plant Growth, Propagation and Development which is available from the Qualifications Section and can also be found on the RHS website together with past papers.

Examiners' Comments:

			Marks
Q1	*a)*	*State **TWO** limitations of propagating plants by vegetative means.*	***2***
	b)	*Describe **FOUR** characteristics of plants requiring propagation by vegetative means.*	***8***

a) Most candidates showed a good knowledge of the limitations of vegetative propagation and gained full marks where detail was given e.g. transfer of pests and diseases between plants, the inability to produce new roots readily especially from old plants and greater skill required by the propagator.

b) Candidates interpreted this section of the question in two ways, both of which were acceptable and were awarded marks. Characteristics of material which make it suitable for propagating by vegetative means included; use of juvenile growth which roots more easily, selection of material for stem cuttings which have sufficient food reserves and the need for rootstock and scion material to be compatible in grafted plants.

Alternatively many candidates provided characteristics of plants which make vegetative propagation a more desirable method than propagation by seed e.g. the plant does not come true from seed, the plant does not produce viable seed, the seed may be difficult to germinate and desirable characteristics such a size, shape, disease resistance or flowering of the plant can be maintained.

Q2 *a)* *State **FOUR** environmental requirements necessary for the successful germination of seeds.* ***4***

b) *Describe the preparation of a container prior to sowing **FINE** seed.* ***6***

a) Candidates who were able to state the environmental requirements correctly were able to gain full marks. Good answers included statements e.g. water which must be imbibed to trigger germination, air/oxygen required for respiration, a suitable temperature depending on the seed and light or darkness depending on the seed.

b) The best candidates described the many stages in the preparation of a container prior to sowing fine seed in the correct sequence and included details of a specific compost e.g. JI seed compost.

Few candidates emphasised the need to overfill the container and strike off the surplus compost and then tap the container to settle the compost before firming the corners of the container with the fingers.

Many candidates gave a description of the sowing of the seed which was not required and therefore could not be awarded any marks.

Q3 *a)* *List **FOUR** types of facility used to propagate plants.* ***2***

b) *Describe how to manage the environmental conditions for **ONE NAMED** facility listed in a).* ***8***

a) Most candidates were able to name suitable examples of facilities to propagate plants from a wide range e.g. mist propagation unit, fogging unit, propagator, cold frame, growing room, polythene tunnel and greenhouse.

b) It was essential for candidates to state what facility they were describing in this section of the question. The best candidates identified the full range of environmental conditions requiring management i.e. temperature, light/shade, humidity and water and then described how each environmental condition is managed in the chosen facility.

In a greenhouse the heating system can be adjusted to provide a suitable temperature for the plants being propagated, benches and floors can be damped down on hot days to increase the humidity and reduce the temperature/rate of transpiration, shading can be used between April and September to reduce the heat in the greenhouse and protect cuttings from wilting before they have rooted or to prevent leaf scorch and the provision of supplementary lighting can be used to increase light levels or extend the light period.

Details of the mechanisms involved were not required.

Q4 *Describe the propagation by division of:*

i) ***ONE NAMED*** *suckering shrub;* ***5***
ii) ***ONE NAMED*** *fibrous-rooted herbaceous perennial.* ***5***

i) A good range of suckering shrubs was identified by most candidates e.g. *Rubus idaeus* cultivars, *Rhus hirta, Kerria japonica* and *Hydrangea* 'Annabelle'. The majority of candidates were able to describe the method of propagating the suckers although several described layering which could not be awarded any marks. The best candidates included details of the time of year when division is carried out, earthing up stools in the autumn prior to division and the need to reduce the size of the sucker to a suitable stated length.

ii) Candidates who named fibrous rooted herbaceous perennials e.g. *Aster frikartii* 'Mönch', *Phlox paniculata* cultivars and *Geranium endressii* cultivars were awarded marks whereas marks could not be awarded for fleshy rooted herbaceous perennials or woody perennials. The best candidates described the timing of lifting and division (March or autumn depending on the plant chosen), the need to discard old growth and select propagules with sufficient buds and roots and the trimming of aerial growth and roots before planting or potting up.

Q5 *a) Describe, using a fully labelled diagram, the propagation of* ***ONE NAMED*** *plant by leaf bud cutting.* ***6***

b) List ***FOUR*** *aftercare requirements necessary for successful rooting of the cutting.* ***4***

a) Candidates who provided a clearly labelled accurate diagram showing the size of the cutting and the position of the bud just above the compost of a named plant propagated by leaf bud cuttings gained maximum marks. Plant examples provided included; *Camellia japonica* cultivars, *Hedera helix*, *Ficus elastica* and *Mahonia japonica.* Additional information given included; the use of clean healthy propagation material, wounding and the application of a medium strength hormone rooting powder.

Candidates who described other methods of propagation e.g. chip budding, leaf lamina cuttings and internodal cuttings could not be awarded any marks.

b) The majority of candidates were able to provide a range of aftercare requirements including; the provision of bottom heat in a propagator or mist unit, the removal of dead or decaying foliage from the top of the compost to prevent fungal diseases and the provision of shade to avoid scorch to the foliage.

Q6 *a) Name* ***FOUR*** *examples of seeds that require cool, dry storage.* ***4***

b) State the effect that cool, dry conditions have on the viability and germination potential of seeds. ***4***

c) Name ***TWO*** *diseases commonly encountered when propagating plants from seed.* ***2***

a) Most candidates were able to name four plant examples and were awarded maximum marks for botanical names. Only large fleshy or some tropical seeds cannot be stored in this way.

b) The majority of candidates stated that cool dry storage extends the period of time seeds can be stored but did not state that the viability and germination potential can decrease with prolonged storage. The best candidates stated that the seeds are quiescent as respiration is slowed down but not stopped completely under these conditions and that fungal diseases are less likely to occur.

c) Most candidates were able to name two diseases e.g. damping off and botrytis/grey mould and gained full marks. Downy and powdery mildew were not acceptable.

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