Royal Horticultural Society

R3104

UNDERSTANDING APPLIED PLANT PROPAGATION

Level 3

Thursday 17 February 2011

15:15 – 15:45

Written Examination

Candidate Number:.....

Candidate Name:.....

Centre Number/Name:.....

IMPORTANT – Please read carefully before commencing:

i) The duration of this paper is **30 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.

Ofqual Unit Code A/601/1043

ANSWER ALL QUESTIONS

MARKS

Q1 a) i) Describe **THREE** storage conditions that ensure the continued viability of seed. **3**

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

ii) Explain how these techniques affect the physiology of the seed. **3**

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

Please see over/.....

MARKS

b) i) Give **TWO** examples of seeds which are difficult to keep viable under standard storage conditions. **2**

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

ii) Explain why this is so. **2**

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

Please turn over/.....

MARKS

Q2 a) Explain the function of **FIVE NAMED** components of a typical mist propagation system. **5**

MARKS

b) Explain the advantages **AND** disadvantages of a mist system compared with a polythene tent. **5**

MARKS

Q3 a) Describe a **NAMED** technique for budding a **NAMED** plant. **5**

MARKS

b) Describe the aftercare of plants that have been budded. **5**

MARKS

Q4 a) Draw a clearly labelled section through a **NAMED** bulb. **4**

Name of bulb:.....

b) Describe a commercial technique for propagating the bulb named in a). **4**

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

Please see over/.....

MARKS

.....

.....

.....

.....

.....

.....

.....

.....

.....

c) Describe how the technique in b), makes use of the anatomy described in a). **2**

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

****

Do not use this page

Do not use this page

**The Royal Horticultural Society, Wisley, Woking, Surrey GU23 6QB.
RHS Charity Registration No: 222879/SC038262**

RHS LEVEL 3 CERTIFICATE IN THE PRINCIPLES OF PLANT GROWTH, HEALTH AND APPLIED PROPAGATION WRITTEN EXAMINATION

15:15pm Thursday 17th February 2011

R3104

UNDERSTANDING APPLIED PLANT PROPAGATION

Candidates Registered	**106**		**Total Candidates Passed**	**56**	**67.47%**
Candidates Entered	83	78.30%	Passed with Commendation	19	22.89%
Candidates Absent	18	16.98%	Passed	37	44.58%
Candidates Deferred	3	2.83%	Failed	27	32.53%
Candidates Withdrawn	2	1.89%			

Q1 a) i) Describe **THREE** storage conditions that ensure the continued viability of seed.

ii) Explain how these techniques affect the physiology of the seed.

b) i) Give **TWO** examples of seeds which are difficult to keep viable under standard storage conditions.

ii) Explain why this is so.

This question is designed to test the candidate's understanding of storage conditions required to maintain seed viability and what effect these conditions have on the physiology of the seed. The question then goes on to explore the candidates practical understanding of seed storage by asking them to provide two named examples of seed that are difficult to keep viable under standard storage conditions.

This question was generally well answered and those candidates who provided three distinct storage conditions scored well. This question does not require the candidate to go down the route of explaining the conditions required by seed to break specific dormancies, rather the candidate should focus on describing storage conditions that are cool, dark and dry which maintain seed viability prior to seed treatments. In keeping the answer simple the candidate is then able to describe what effect storage in cool, dry conditions away from direct sunlight might have on respiration, moisture uptake and the longevity of seed viability. The question then goes on to explore the candidates understanding of orthodox and recalcitrant seed and to gain full marks in b) the candidate is required to provide two plant examples giving their correct latin name in full, and to explain why the two examples are difficult to store.

Good information on seed storage is contained within the publication Hartmann and Kester's Plant Propagation Principles and Practice, and a full list of IPPS conference papers relating to seed storage, including abstracts, can be found by going to www.ipps.org

'Seed sowing and growing success' by Karen Platt .
'Success with seed' by Chris and Valerie Wheeler.
'Raising trees and shrubs from seed' by the Forestry Commission.

Q2 a) Explain the function of **FIVE NAMED** components of a typical mist propagation system.

b) Explain the advantages **AND** disadvantages of a mist system compared with a polythene tent.

The question is designed to test the candidate's understanding of a mist propagation facility and then to compare and contrast this facility with a polythene propagation tent.

This question was generally well answered and those candidates who selected five distinct components of a mist system scored well. These components could include control mechanisms such as timers, electronic leaves, evapo-sensors and thermostats, a bench with soil warming cables, mist nozzles, solenoid valves, pressurised tanks and filters.

The second part of the question asks the candidate to assess the practical differences between propagating within a polythene tent and a mist unit. To score well the candidate should address humidity levels, types of plants suited to each environment, cost of installation and maintenance, flexibility of each system, the cooling effect of the mist as compared to condensation and drip formation in polythene. References to new supa-polythenes would indicate that the candidate had up to date knowledge to draw on.

Good information on setting up and using both polythene tents and mist units is contained within the publication Hartmann and Kester's Plant Propagation Principles and Practice, and a full list of IPPS conference papers relating to this type of propagation, including abstracts, can be found by going to www.ipps.org Every opportunity should be made by the candidate to gain practical experience of these facilities.

Q3 a) Describe a **NAMED** technique for budding a **NAMED** plant.

b) Describe the aftercare of plants that have been budded.

This question is designed to test the candidates understanding of the propagation technique of budding and subsequent aftercare. The question also requires the candidate to specify the type of budding that they will be describing and an appropriately named plant example.

Some candidates found this question more challenging and to gain a good score it is important that the candidate understands that the technique refers to a type of grafting and not to leaf bud cutting propagation. A good answer will refer to the type of cuts that are made on both the rootstock and scion and the need to match the cambium layers of both, when securing the graft with tape or a patch. To gain maximum marks the plant example described by the candidate must include its latin name in full.

It is important to identify that a) and b) are equally weighted and therefore requires the same level of response. Most budding is done in the field and good answers would reflect this growing environment. Aftercare includes regular monitoring for pest and diseases, regular checking of the union for evidence of callus and the removal of the polythene tape ahead of re-growth in late winter. Good answers included information about the retention of the leaf petiole on the scion and the observation that successful grafts push off the leaf petiole as the union heals.

Good information on budding techniques is contained within the publication Hartmann and Kester's Plant Propagation Principles and Practice, and a full list of IPPS conference papers relating to this type of propagation, including abstracts, can be found by going to www.ipps.org
Every opportunity should be made by the candidate to gain practical experience of this technique.

Q4 a) Draw a clearly labelled section through a **NAMED** bulb.

b) Describe a commercial technique for propagating the bulb named in a).

c) Describe how the technique in b), makes use of the anatomy described in a).

This question requires the candidate to draw and label a named bulb section, describe a commercial propagation technique for the named bulb and then relate the named bulb parts from a) to the successful propagation of the species.

This question relies on the candidate building on their knowledge as the question progresses and it is therefore important to clearly label a cross section of a named bulb that is in commercial production. Selecting an obscure bulb can lead to difficulties when describing a commercial propagation technique in b). Labelled parts in a) could include scale, papery tunic, nose or neck, basal plate, roots, flower bud, and bulbil. To gain maximum marks the bulb labelled in a) must include its full latin name.

To score well in b) the selected propagation technique needs to be both appropriate to the species and commercial, so for instance twin scaling could apply to both Galanthus and Narcissus but not Tulipa. Multiplication through field grown division could apply to all three. Finally mention of the basal plate and the ability of this part of the bulb to divide and form new bulbils is the key to scoring well here.

For good information on bulb propagation reference the RHS Publication ‘Propagating Plants’, ‘Ornamental bulbs, corms and tubers’ by A.R Rees or watch the RHS How to Propagate DVD.