



RHS LEVEL 2 CERTIFICATE IN HORTICULTURE

Wednesday 22 June 2011
2.00pm – 3.30pm

HORTICULTURE II – Ornamental, Principles & Maintenance

Section 1 – Short Answer Questions

Candidate Number:

Candidate Name:

Centre Number/Name:

IMPORTANT - Please read carefully before commencing:

- i) The duration of the papers in Horticulture II is **1½ hours**;
- ii) **ALL** questions should be attempted in Section 1;
- iii) **EACH** question carries **2 marks**;
- iv) Write your answers legibly on the lines provided;
- v) Use metric measurements **ONLY**;
- vi) Where plant names are required, they should include genus, species and where appropriate, cultivar.

Please turn over

ALL questions should be attempted.

Marks

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Q1 List **FOUR** sources of organic matter in soils.

2

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Q2 Using the table below:

- a) State **TWO** major nutrients used by plants.
- b) State **TWO** minor/trace elements used by plants.

2

Nutrient Class	Example 1	Example 2
Major		
Minor/Trace		

Q3 State **FOUR** properties of vermiculite.

2

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Please see over

Marks

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Q4 State **TWO** benefits and **TWO** limitations of using polythene as a cladding material for cloches.

2

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Q5 State **FOUR** ways that light levels can be manipulated in a protected environment.

2

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Q6 State **FOUR** maintenance tasks carried out in the production of a **NAMED** bulb grown for forcing.

2

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Please turn over

Marks

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Q7 Name and describe **TWO** herbaceous perennials grown for a specific colour effect.

2

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Q8 State **THREE** items of equipment used while pruning a **NAMED** large shrub.

2

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Q9 State the method required to control a **NAMED** pest on a **NAMED** woody plant.

2

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Please see over

- Q10** a) State the ideal season for using scarifiers on a fine lawn.
- b) State **THREE** maintenance tasks which may be carried out on a fine lawn at the time stated in a).
- 2**

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- Q11** State **FOUR** health and safety checks needed when preparing to mow a lawn using powered equipment.
- 2**

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- Q12** State **TWO** methods which can be adopted in the sowing of hardy annuals directly into the border giving **ONE** advantage of **EACH** method.
- 2**

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Q13 Using the table below, define the following terms:

a) Hazard.

b) Risk.

2

Term	Definition
Hazard	
Risk	

Q14 Using the table below:

a) Define the term physical/cultural control.

b) Using a **NAMED** example state **ONE** physical or cultural control method of crop protection.

2

Definition	
Named example	

Q15 Describe the damage caused by a **NAMED** bacterial disease on a **NAMED** plant.

2

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**The Royal Horticultural Society, Wisley, Woking, Surrey GU23 6QB
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RHS LEVEL 2 CERTIFICATE IN HORTICULTURE

Wednesday 22 June 2011
2.00pm – 3.30pm

HORTICULTURE II – Ornamental, Principles & Maintenance

Section 2 – Structured Questions

IMPORTANT - Please read carefully before commencing:

- i) The duration of the papers in Horticulture II is **1½ hours**;
- ii) Any **THREE** questions in Section 2 should be attempted;
- iii) **EACH** question carries **10 marks**;
- iv) Start **EVERY** new question on a separate answer booklet;
- v) Use metric measurements **ONLY**;
- vi) Where plant names are required, they should include genus, species and where appropriate, cultivar.

Please turn over

Answer **THREE** questions from this section.

		Marks
Q16	a) Define the term soil 'pore space'.	2
	b) State how the pore space affects the air and water content of the soil.	4
	c) Describe TWO distinct ways of developing a stable pore network in a NAMED soil.	4
Q17	a) State TWO symptoms of poor drainage in the garden.	2
	b) Describe with the help of clearly labelled diagrams TWO distinct garden drainage systems.	8
Q18	a) State, for EACH of the following types of container, ONE benefit and ONE limitation of their use in horticulture:	
	i) pot;	2
	ii) seed tray;	2
	iii) cell tray.	2
	b) State FOUR considerations in the selection of containers used for indoor plant display.	4
Q19	a) Name and describe TWO plants suitable for inclusion in a wildflower grassland area.	4
	b) Describe the annual maintenance for a wildflower grassland under the following headings:	
	i) soil nutrient levels;	2
	ii) timing of operations;	2
	iii) machinery used for mowing.	2

Please see over

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| Q20 | a) Describe TWO NAMED trees grown for their ornamental bark. | 2 |
| | b) Describe the planting of a standard tree. | 6 |
| | c) Describe its aftercare in the first year. | 2 |
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Q21 |
Describe FIVE distinct methods by which pest control is achieved without disturbing the natural balance in the garden. |
10 |

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RHS LEVEL 2 CERTIFICATE IN HORTICULTURE

22 June 2011

Horticulture II

Candidates Registered	581	Pass with Commendation	182 (45.73%)
Candidates Entered	398	Pass	176 (44.22%)
Absent/Withdrawn/Deferred	183	Fail	40 (10.05%)
Total Candidates Passed	358 (89.95%)		

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 are 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 the 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. This is particularly so where candidates answer either more questions or more parts to a question than are required.
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. In the short answer sections it is important to ensure that responses are to the point and contained within the space allocated. 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 to structured questions are focussed 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 in structured questions 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 both short and structured 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 Horticulture which is available from the Qualifications Section and can also be found on the RHS website together with past examination papers.

Examiners' Comments:

Marks

Q1 List **FOUR** sources of organic matter in soils.

2

Some candidates interpreted this question to mean four sources of organic matter added by man, while others interpreted it as four sources of organic matter provided by natural processes. Both responses were positively rewarded.

Q2 Using the table below:

a) State **TWO** major nutrients used by plants.

b) State **TWO** minor/trace elements used by plants.

2

Nutrient Class	Example 1	Example 2
Major		
Minor/Trace		

Most candidates were awarded full marks for identifying correctly two major and two minor plant nutrients. Magnesium and calcium were incorrectly named in a few scripts as minor nutrients, as these are generally accepted to be required in relatively large quantities.

Q3 State **FOUR** properties of vermiculite. **2**

A generally well answered question. However some candidates indicated, incorrectly, uses of vermiculite rather than its properties. For example, "...used as a top dressing for sown seeds".

Q4 State **TWO** benefits and **TWO** limitations of using polythene as a cladding material for cloches. **2**

Most responses correctly suggested benefits of being easy to erect, safe to work near, sides can be lifted for ventilation. However, "cheap" was not rewarded, as this is a very subjective measurement. Limitations include short life, high temperatures due to inadequate ventilation, and increased plant disease risk.

Q5 State **FOUR** ways that light levels can be manipulated in a protected environment. **2**

Very few candidates were awarded full marks. Correct answers included all types of shading, use of lamps to extend daylight hours, use of lamps to provide alternative wavelengths, total blackout to increase night length, choice of cladding, orientation of structure and removal of shading around structure.

Q6 State **FOUR** maintenance tasks carried out in the production of a **NAMED** bulb grown for forcing. **2**

Many candidates did not notice the word "forcing" and simply offered 4 maintenance tasks in producing flowers from a bulb. Very few candidates were able to offer a full botanical name, with many offering "hyacinth" which did not gain marks, whereas "*Hyacinthus orientalis*", or one of its cultivars, would have been rewarded.

Q7 Name and describe **TWO** herbaceous perennials grown for a specific colour effect. **2**

Few candidates managed to provide two full botanical names. Occasionally non-herbaceous plants were offered. The actual colour of the plant was also often missed, which is surprising when the question refers to "colour effect".

Q8 State **THREE** items of equipment used while pruning a **NAMED** large shrub. **2**

Most candidates managed to provide a named large shrub, with *Buddleja davidii* being the most common. Secateurs, loppers and pruning saw were all accepted as items of pruning equipment. However, gloves are not used to actually prune a plant, and were therefore not acceptable. Mention of ladder use was rewarded for large named shrubs.

Q9 State the method required to control a **NAMED** pest on a **NAMED** woody plant. **2**

Most candidates offered aphids on a *Rosa* cultivar and suggested physical removal, spraying with fatty acids or spraying with a contact or systemic insecticide. Proprietary brand names were not accepted, active ingredients were. Many candidates suggested "...encouraging ladybirds..." with no explanation of exactly how they would do this, or persuade them to stay once they had arrived. Such vague statements were not rewarded. Other answers included codling moths on apple cultivars, rabbits or deer on small trees and sawfly caterpillars on gooseberry cultivars.

- Q10** a) State the ideal season for using scarifiers on a fine lawn.
- b) State **THREE** maintenance tasks which may be carried out on a fine lawn at the time stated in a).

2

Spring or autumn were accepted as the correct seasons for scarifying. Most candidates were able to offer 3 maintenance tasks, which had to be correct for the season named.

- Q11** State **FOUR** health and safety checks needed when preparing to mow a lawn using powered equipment.

2

Descriptions of personal protective clothing, removal of debris from the lawn, removal of children and animals from the lawn, correctly working circuit breakers, sound electric cables, adequate training and suggestions of how the mower should be maintained in good condition were all rewarded.

- Q12** State **TWO** methods which can be adopted in the sowing of hardy annuals directly into the border giving **ONE** advantage of **EACH** method.

2

Most candidates were able to offer sowing in drills, which enables weeds to be identified and hoed off between rows, and broadcast sowing, which gives a more natural effect and is quicker, as two methods of sowing. Station sowing was also accepted.

Some candidates did not read the question properly and failed to see the words “directly” and “sowing”, offering all sorts of incorrect answers as a result.

- Q13** Using the table below, define the following terms:

a) Hazard.

b) Risk.

2

Term	Definition
Hazard	
Risk	

Many vague responses were seen to this question concerning the development of safe working practices.

A hazard is defined as a set of circumstances which could lead to personal injury.

A risk is defined as the possibility of personal injury actually occurring as a result of coming into contact with a particular hazard. (Often it is measured as a percentage chance of injury).

Half marks were awarded to those candidates who gave a correct example, but could not write a full definition. For example Hazard – Pond, Risk – Drowning in the pond.

Q14 Using the table below:

- a) Define the term physical/cultural control.
- b) Using a **NAMED** example state **ONE** physical or cultural control method of crop protection.

2

Definition	
Named example	

Some candidates described what physical and cultural control involved, while others stated that it was “not chemical or biological control”. Both styles of answers were rewarded.

Part b) was often incompletely answered, as it required a pest, a control and a crop. Some candidates offered non-crop plants, such as controlling slugs on *Hosta* spp. with copper bands, which did not gain marks.

Q15 Describe the damage caused by a **NAMED** bacterial disease on a **NAMED** plant.

2

Fire blight and bacterial canker were the 2 most frequent answers. Crown rot of rhubarb, bacterial blight of pelargonium and bleeding canker of *Aesculus hippocastanum* were other correct answers.

However problems arose in naming a plant that might be affected by the above bacterial infections. Some candidates stated that fire blight affects ALL members of the Rosaceae family, whereas it only affects the pomoideae sub-group. Bacterial canker only affects *Prunus* species, not *Malus species* – many candidates actually described the effects of Apple Canker which is in fact a fungal disease.

A significant number of candidates could not name a bacterial disease, many offering fungal, and occasionally viral diseases instead.

Section 2 – Structured Questions		Marks
Q16	<p>a) Define the term soil 'pore space'.</p> <p>b) State how the pore space affects the air and water content of the soil.</p> <p>c) Describe TWO distinct ways of developing a stable pore network in a NAMED soil.</p>	<p>2</p> <p>4</p> <p>4</p>
<p>a) Generally well answered, with the majority of candidates explaining that the voids between the solids in soil is pore space and that they are filled with air and/or water; this response achieved full marks. Most candidates were able to give this response.</p> <p>b & c) For full marks, the candidate needed to relate pore space size to drainage and water retention, and to relate the pore size to the soil texture. Most candidates were able to explain this reasonably well, with a significant proportion able to describe in detail the macro/meso/micro pore and aspects such as hygroscopic water. It was less common to link these factors to textural class and, where the candidate did not name a specific soil, no marks were awarded. Unfortunately this was the case on a number of occasions. There were also a number of responses that did not refer to pore network stability, referring instead to general issues of soil structure.</p>		
Q17	<p>a) State TWO symptoms of poor drainage in the garden.</p> <p>b) Describe with the help of clearly labelled diagrams TWO distinct garden drainage systems.</p>	<p>2</p> <p>8</p>
<p>Most candidates answered this well, with examples such as indicator plants and surface puddles being given.</p> <p>Those scripts which described distinct designs such as grid and herring-bone pipe system, with suitable diagrams and labels, were well rewarded. However there were also a number of suggestions that a soakaway, without use of pipe or other transport, and without recognition that the soakaway must link to drained substrate, was suitable. Marks were not awarded for this, or for the use of mole drains which are inappropriate in a garden situation.</p>		
Q18	<p>a) State, for EACH of the following types of container, ONE benefit and ONE limitation of their use in horticulture:</p> <p>i) pot;</p> <p>ii) seed tray;</p> <p>iii) cell tray.</p> <p>b) State FOUR considerations in the selection of containers used for indoor plant display.</p>	<p>2</p> <p>2</p> <p>2</p> <p>4</p>

This was generally well answered, with responses typically involving the range of pot size and type, the use of seed trays for sowing large numbers of seeds, and the avoidance of root damage as benefits; the space requirement, waste of seed and rapid drying out as limitations.

Well rewarded responses considered, for example, container size, appearance, drainage/water retention and weight. Most candidates covered this range, though a number failed to consider the need for a 'saucer' or similar container beneath pots. A small number of responses also did not consider the indoor site, citing a requirement for frost resistant containers.

- Q19** a) Name and describe **TWO** plants suitable for inclusion in a wildflower grassland area. **4**
- b) Describe the annual maintenance for a wildflower grassland under the following headings:
- i) soil nutrient levels; **2**
 - ii) timing of operations; **2**
 - iii) machinery used for mowing. **2**
- a) Full marks were achieved by candidates who quoted complete botanic names with detailed plant descriptions. *Primula veris* and *Papaver rhoeas* were popular choices.
- b) Those scripts which gave detailed consideration to the maintenance of low nutrient levels, the timing of cutting to achieve spring or summer floral meadows, and choice of rotary, flail or reciprocating mowers, received the highest marks. Most candidates described the importance of low nutrients effectively, describing the need to 'cut and lift' to manage grass fertility. Cutting was variously given as early spring to late autumn; this was less well-answered. Mowing machinery was considered effectively in many responses, with most also correctly specifying machinery to facilitate the removal of cut plant material.
- Q20** a) Describe **TWO NAMED** trees grown for their ornamental bark. **2**
- b) Describe the planting of a standard tree. **6**
- c) Describe its aftercare in the first year. **2**
- Full marks were achieved where botanic names of appropriate trees were given, with appropriate descriptions. (Where no description was given, no marks were awarded.) A number of candidates suggested that *Cornus alba* or *C. sanguinea* were appropriate – again, no marks were awarded, these being regarded as shrubs. *Betula pendula*, *Acer griseum* and *Prunus serrula* were the most commonly named species.
- Well rewarded responses would included size/shape of hole, amelioration of backfill, ensuring that roots were protected from drying out, stake size, position and tying, backfilling and consolidation, protection, watering and mulching. Diagrams were particularly appropriate in this case. Most candidates answered well, with a significant number correctly using square tree pits; short stakes being normally given; use of angled staking where a rootballed/pot-grown tree was stated. The most notable weakness was in suggesting minimal or ineffective consolidation. Good answers included watering, weed control/mulching, checking for pests and diseases, checking ties. Most candidates were able to give at least three requirements.
- Q21** Describe **FIVE** distinct methods by which pest control is achieved without disturbing the natural balance in the garden. **10**

Common responses in this well-answered question included use of companion planting; trap or sacrificial plants; encouragement of natural parasites and predators; use of resistant cultivars; use of barriers such as fleece; and the use of crop rotation systems.

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Sept 2011