



## RHS LEVEL 2 CERTIFICATE IN HORTICULTURE

**Wednesday 18 February 2009**  
**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** State **TWO** differences between freshly cut waste plant material and humus in soil.

2

	Waste plant material	Humus
1		
2		

- Q2** State **FOUR** methods of composting garden waste.

2

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- Q3** State the effect of soil pH on the availability of **TWO NAMED** plant nutrients.

2

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- Q4** State **TWO** distinct reasons for the use of artificial lighting in a protected environment.

2

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- Q5** State **TWO** advantages and **TWO** limitations of cladding a protective structure with plastic compared with glass.

2

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- Q6** State **ONE** advantage and **ONE** limitation of using a greenhouse for the all year round production of a **NAMED** salad crop.

2

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Please turn over .....

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**Q7** State **FOUR** ways of reducing the frequency of watering hanging baskets. **2**

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**Q8** Name and describe **TWO** half-hardy annual plants suitable for a summer bedding display. **2**

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**Q9** Describe **THREE** pruning operations on a **NAMED** shrub grown for spring flowering. **2**

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Please see over .....

Marks

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**Q10** Name **TWO** herbaceous perennial plants, **ONE** for spring flowering and **ONE** for autumn flowering.

**2**

Season	Plant Name
Spring	
Autumn	

**Q11** List **FOUR** reasons for rejecting a container-grown shrub at purchase.

**2**

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**Q12** Name **TWO** shrubs grown for their scent.

**2**

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Please turn over .....

**Q13** Define the term 'ephemeral' in relation to weeds and give a **NAMED** example.

**2**

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**Q14** State the life cycle of a **NAMED** plant pest, **AND** the stage at which control is most effective.

**2**

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**Q15** Describe **ONE** physical method of controlling a **NAMED** pest.

**2**

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The Royal Horticultural Society, Wisley, Woking, Surrey GU23 6QB



## RHS LEVEL 2 CERTIFICATE IN HORTICULTURE

**Wednesday 18 February 2009**  
**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
<b>Q16</b>	a) State <b>TWO</b> effects of nitrogen on plant growth.	4
	b) Describe the nitrogen cycle with the aid of a clearly labelled diagram.	6
<b>Q17</b>	Describe the annual maintenance of a <b>NAMED</b> decorative pot plant for display in a conservatory, using the following headings:	1
	i) environment control;	3
	ii) irrigation;	2
	iii) nutrition;	2
	iv) pest and disease control.	2
<b>Q18</b>	a) List <b>FOUR</b> factors that affect natural light transmission into a greenhouse.	2
	b) For each of the factors listed in a), state how light transmission could be maximised.	8
<b>Q19</b>	a) Name and describe <b>FOUR</b> plants for spring display in containers out of doors.	4
	b) Describe the container selection and plant establishment to ensure a long display period.	6

Please see over .....

- Q20** a) Name and describe **TWO** plants suitable for permanent shade. **4**
- b) Describe the cultivation of plants in shady conditions under the following headings:
- i) ground preparation for planting; **2**
  - ii) planting; **2**
  - iii) establishment during first growing season. **2**
- Q21** a) Describe the following control methods **EACH** with reference to a **NAMED** pest:
- i) biological; **2**
  - ii) cultural; **2**
  - iii) physical; **2**
  - iv) chemical. **2**
- b) Select **TWO** types of control from the list in a). For **EACH** state **TWO** distinct ways of reducing its impact on the environment. **2**

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## **RHS LEVEL 2 CERTIFICATE IN HORTICULTURE**

**18 February 2009**

### **Horticulture II**

<b>Candidates Registered</b>	617	<b>Pass with Commendation</b>	37.98%
<b>Candidates Entered</b>	495	<b>Pass</b>	44.24%
<b>Absent/Withdrawn/Deferred</b>	122	<b>Fail</b>	17.78%
<b>Total Candidates Passed</b>	407		

#### **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.
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.
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. Regrettably, some candidates quoted Imperial measurements in their answers, when required specifically to use Metric units.
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.
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 a proportion of candidates is 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. Appropriate feedback must, in any case, be provided.
10. Candidates should be aware of the reading list of suggested books for the RHS (Level 2) Certificate in Horticulture which is available from RHS Qualifications and can also be found on the RHS website together with past examination papers.

### Examiners' Comments:

#### Section 1 - Short Answer Questions

#### Marks

- Q1** State **TWO** differences between freshly cut waste plant material and humus in soil.

	<b><i>Waste plant material</i></b>	<b><i>Humus</i></b>
1		
2		

**2**

Many responses showed that candidates had a clear understanding of the differences between newly cut plant material and humus in soils. The relatively rapid decay, the presence of recognizable structures and the requirement for mineral nutrients to assist decay were expected for freshly cut material, while the contrasting amorphous character with the slow release of nutrients of humus was rewarded.

- Q2** State **FOUR** methods of composting garden waste.

**2**

Most candidates were able to state four methods of composting, including compost bin, compost heap, leaf mould, and wormeries. Some used descriptions of hot and cold composting, but did not state these were aerobic and anaerobic respectively. Green manuring and extraction in water were also rewarded as viable approaches.

- Q3** State the effect of soil pH on the availability of **TWO NAMED** plant nutrients.

**2**

This question was well answered by those candidates who attempted it, with a clear understanding of the effects of soil pH on the availability of named plant nutrients. However, there were some who misread the question, and described which plants preferred acid or alkaline soils.

- Q4** State **TWO** distinct reasons for the use of artificial lighting in a protected environment. **2**
- Many candidates correctly identified lighting to improve plant growth by supplementing natural daylight (photosynthetic lighting), and for manipulation of day length to obtain specific growth responses, (photoperiodic lighting).
- Q5** State **TWO** advantages and **TWO** limitations of cladding a protective structure with plastic compared with glass. **2**
- Well answered by the many candidates who understood the term 'cladding'. Advantages included: low cost, lightweight, can be moulded into complex shapes, safe handling. Limitations: poor light transmission, can be damaged easily, decays relatively quickly.
- Q6** State **ONE** advantage and **ONE** limitation of using a greenhouse for the all year round production of a **NAMED** salad crop. **2**
- Many candidates repeated the term 'all year round' without reward. Lettuce and Tomato were the most popular 'salad crops'. Most responses gave an advantage that the salad could be made available 'out of season'. Most gave a limitation as build up of pests and/or diseases from continuing use of the same growing medium. Poor germination and/or bolting of lettuce due to high temperatures were also correctly stated by some candidates as limitations.
- Q7** State **FOUR** ways of reducing the frequency of watering hanging baskets. **2**
- A well answered question with points awarded, for example, for: placing the basket out of direct sunlight, away from drying winds, use of plastic liners, fitting a reservoir at the base of the basket, use of water retentive crystals, etc.
- Mulches were not rewarded neither was the use of automatic irrigation.
- Q8** Name and describe **TWO** half-hardy annual plants suitable for a summer bedding display. **2**
- Correctly named half-hardy plants, with genus, species and cultivar were given full marks. Too many scripts incompletely named plants, losing points as a result of examiners being unable to identify the plant being described.
- Q9** Describe **THREE** pruning operations on a **NAMED** shrub grown for spring flowering. **2**
- Many responses failed to name a shrub, or gave one which is not grown for spring flowering. These could not be rewarded.
- The most commonly chosen plant was *Forsythia x intermedia*. Points were awarded for operations such as removal dead, diseased and damaged wood, up to 1/3 of oldest stems, maintaining shape. An indication as to when pruning was to be carried out was expected. Some candidates named shrubs such as *Magnolia sp.* or *Camelia sp.* which require little or no pruning.

- Q10** Name **TWO** herbaceous perennial plants, **ONE** for spring flowering and **ONE** for autumn flowering. **2**

Season	Plant Name
Spring	
Autumn	

Many candidates were able to fully name two plants. However, some scripts gave common names or incomplete scientific names which could not be fully rewarded. Common responses were: *Helleborus orientalis* and *Aster novi-belgii* respectively.

- Q11** List **FOUR** reasons for rejecting a container-grown shrub at purchase. **2**

A well answered question by most candidates. They correctly listed faults such as: weeds in the compost, roots emerging from the base of the container, dried out compost separating from the walls of the container, rootstock suckering, reverted shoots, and poor vigour.

- Q12** Name **TWO** shrubs grown for their scent. **2**

Many candidates were able to fully name two shrubs grown for their scent, for example: *Daphne odora*, *Viburnum x bodnantense*, and *Chimonanthus praecox*.

- Q13** Define the term 'ephemeral' in relation to weeds and give a **NAMED** example. **2**

A well answered question, most candidates stating that an ephemeral plant has more than one complete life cycle in one growing season. Common examples were *Stellaria media*, *Senecio vulgaris*, and *Cardamine hirsuta*.

- Q14** State the life cycle of a **NAMED** plant pest, **AND** the stage at which control is most effective. **2**

Most commonly, the Cabbage White butterfly was named, with a four stage 'complete' life cycle. Better candidates drew a small sketch to illustrate their answer. Most were able to state that the larval stage was the most effective one to control. Candidates lost marks for failing to name the pest and / or failing to name the stage.

- Q15** Describe **ONE** physical method of controlling a **NAMED** pest. **2**

Slugs and snails were commonly named, with trapping, copper bands, or grit surrounding vulnerable plants as physical methods of control.

## Section 2 - Structured Questions

Marks

- Q16** a) State **TWO** effects of nitrogen on plant growth. **4**
- b) Describe the nitrogen cycle with the aid of a clearly labelled diagram. **6**
- a) The answers given for this part of the question lacked sufficient detail; for example, some candidates mentioned green leaves, but not chlorophyll or the role of nitrogen in protein formation.
- b) Most of the answers were supported by good diagrams, which gave examples of the ways in which nitrogen is added to soils in forms which are available to plants. However, loss pathways from the soil were often omitted. The description of each phase of the nitrogen cycle was frequently inadequate and lacked a clear explanation. Those answers that systematically explained the stages of the nitrogen cycle, in the correct order, scored maximum marks.
- Q17** Describe the annual maintenance of a **NAMED** decorative pot plant for display in a conservatory, using the following headings: **1**
- i) environment control; **3**
- ii) irrigation; **2**
- iii) nutrition; **2**
- iv) pest and disease control. **2**
- i) Ventilation methods and their effects were seldom mentioned. The control and effect of light levels were well explained in most answers. Methods of controlling temperature were often specified for the winter period but not for the summer months. The effect of humidity in a conservatory was well covered in most scripts; however methods of control frequently lacked detail.
- ii) Seasonal watering patterns were not well covered, which resulted in a loss of marks. Most answers concentrated on the method of watering e.g. capillary matting.
- iii) Seasonal variation in nutrient requirements was generally well covered; however detail was often lacking of application methods, and balance of nutrients.
- iv) Some good examples were given; however, lack of detail lost marks allocated to life cycles and control methods.



<b>Q18</b>	<p>a) List <b>FOUR</b> factors that affect natural light transmission into a greenhouse.</p> <p>b) For each of the factors listed in a), state how light transmission could be maximised.</p>	<p>2</p> <p>8</p>
	<p>a) This was generally well answered, examples given included; orientation, cladding material, and the material used for the construction of the frame. Full marks could not be awarded to those candidates who gave shade effects as two examples, such as shade from trees and shade from nearby buildings.</p> <p>b) This was well answered by many candidates, who gave good practical examples of the effects and methods of improvement. Some answers confused the seasonal orientation of the glasshouse in that maximum light is achieved in winter with an East-West orientation of the ridge, while in summer it requires a North-South alignment. Only a few candidates fully covered the differences between different cladding materials. Polycarbonate was rarely mentioned, in spite of its widespread use.</p>	
<b>Q19</b>	<p>a) Name and describe <b>FOUR</b> plants for spring display in containers out of doors.</p> <p>b) Describe the container selection and plant establishment to ensure a long display period.</p>	<p>4</p> <p>6</p>
	<p>a) Frequently, common names only were given with a consequent loss of marks, particularly where examiners were unable to relate descriptions to the plants cited. The description of the plant examples was not adequate in many answers; for example, 'white flowers', or even a 'green plant' with no mention of the shape, size or structure of the plant. Most of the answers given proposed suitable plants, although a few selected summer flowering examples, which were not rewarded.</p> <p>b) The container selection was generally adequate however siting was frequently omitted. Many answers provided a limited description of the establishment process, but concentrated on the longer term maintenance of the container which was not rewarded.</p>	
<b>Q20</b>	<p>a) Name and describe <b>TWO</b> plants suitable for permanent shade.</p> <p>b) Describe the cultivation of plants in shady conditions under the following headings:</p> <p>i) ground preparation for planting;</p> <p>ii) planting;</p> <p>iii) establishment during first growing season.</p>	<p>4</p> <p>2</p> <p>2</p> <p>2</p>
	<p>a) Many good examples of plants suitable for shade were given. However, a description of the plant was often omitted or very brief.</p>	

- b) i) This was generally well answered, with the principles of ground preparation clearly described.
- ii) This was well answered by most candidates who had a clear understanding of planting techniques.
- iii) This part of the question was often not as well answered, because many candidates concentrated on watering and weeding; but failed to mention feeding, mulching, Pest and Disease control and pruning, where appropriate.

**Q21** a) Describe the following control methods **EACH** with reference to a **NAMED** pest:

- i) *biological;* **2**
- ii) *cultural;* **2**
- iii) *physical;* **2**
- iv) *chemical.* **2**

b) Select **TWO** types of control from the list in a). For **EACH** state **TWO** distinct ways of reducing its impact on the environment. **2**

- a) i) In most cases well answered. Candidates lost marks where the answers were very brief and included little or no facts. For example: the Biological agent was not named, no information on how the agent should be introduced into the crop.
- ii) This question caused some confusion because a few candidates muddled the cultural and physical methods of control. In many cases candidates illustrated a wide knowledge of possible cultural methods. For example, the use of resistant cultivars.
- iii) The use of physical barriers was understood by most candidates and some good examples were seen.
- iv) This was a method well known by most candidates. Unfortunately some answers also included mention of herbicides and fungicides which could not be rewarded.
- b) Some candidates made it difficult for themselves and selected Physical and Cultural methods of control, but most chose chemical for which they could easily identify two ways of reducing the impact on the environment. For the other methods it was much more difficult and marks were awarded to candidates who showed evidence of original thought in this important area.

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