



RHS LEVEL 2 CERTIFICATE IN HORTICULTURE

Wednesday 23 June 2010
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	Do not write in this margin
Q1	State FOUR indicators of poor soil drainage.	2	
		
		
		
		
		
Q2	a) State what the pH scale measures.		
	b) State the pH range that supports the growth of most temperate plants in mineral soils.	2	
		
		
		
		
		
Q3	State TWO functions of magnesium in plant growth.	2	
		
		
		
		
		

Q4 State **FOUR** factors which affect light transmission into greenhouses. 2

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Q5 a) Name a tender plant normally overwintered in greenhouses in a **NAMED** region of the UK.

b) State the months between which protection is usually needed for the plant named in a). 2

Plant	
Region	
Start month	
End month	

Q6 List **FOUR** environmental factors which need to be considered when providing for the healthy growth of plants in an interior display. 2

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Marks

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Q7 Name **ONE** hedging plant and state the pruning required immediately after planting.

2

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Q8 State **ONE** fungal disease of a **NAMED** ornamental plant.

2

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Q9 Name **TWO** plants suitable for **EACH** of the following aspects:
i) north facing;
ii) south facing.

2

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Please see over

Marks

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Q10 List **FOUR** plants suitable for a spring display in a window box.

2

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Q11 a) Name **TWO** types of spiker tine which can be used for turf maintenance.

b) State the reason for the use of **ONE** of the tines named in a).

2

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Q12 Using the table below, identify **TWO** advantages and **TWO** limitations of establishing lawns from turf compared to seed.

2

Advantages	
Limitations	

Please turn over

Marks

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Q13 State **ONE** symptom of the damage caused by **TWO NAMED** pests.

2

	Pest	Symptom
1		
2		

Q14 a) Define the term 'weed'.

b) State **TWO** ways in which weeds reduce plant productivity.

2

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Q15 Using the table below, state **ONE** benefit and **ONE** limitation of the methods of pest control stated.

2

Pest Control	Benefit	Limitation
Biological		
Chemical		

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

Wednesday 23 June 2010
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) State the meaning of the term 'soil profile'.	2
	b) Describe a typical soil profile.	4
	c) Describe FOUR properties of top soil that contribute to the healthy growth of plants.	4
Q17	a) State THREE methods of determining when to water plants growing in containers.	3
	b) Describe the benefits and limitations of TWO of the methods listed in a).	4
	c) Describe ONE method of irrigating container-grown plants.	3
Q18	Describe under the following headings, the production of a decorative pot plant:	
	i) plant name;	1
	ii) propagation and establishment;	4
	iii) maintenance;	3
	iv) control of ONE named pest and ONE named disease.	2
Q19	Describe the maintenance of a large, regularly used utility lawn under the following headings:	
	i) mowing;	2
	ii) feeding;	2
	iii) weed control;	2
	iv) aeration;	2
	v) top dressing.	2

Please see over

Q20	a) Name and describe THREE plants suitable for a dry soil.	6
	b) State FOUR techniques which would reduce the need for irrigation in the establishment of a border.	4
Q21	a) Define the term 'plant disease'.	1
	b) Name ONE viral disease of plants:	1
	i) state TWO methods by which the disease is spread;	2
	ii) describe the damage this disease causes to plants;	2
	iii) state TWO methods of minimising the spread of this disease.	4

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RHS LEVEL 2 CERTIFICATE IN HORTICULTURE

23 June 2010

Horticulture II

Candidates Registered	1922	Pass with Commendation	537 (33.25%)
Candidates Entered	1615	Pass	770 (47.68%)
Absent/Withdrawn/Deferred	307	Fail	308 (19.07%)
Total Candidates Passed	1307 (80.93%)		

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 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. 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 the Qualifications Section and can also be found on the RHS website together with past examination papers.

Examiners' Comments:

Section 1 - Short Answer Questions

Marks

Q1 State **FOUR** indicators of poor soil drainage.

2

Most candidates were able to give FOUR indicators of poor soil drainage; better answers had four very specific indicators, e.g. indicator plants, water logging, un-decomposed plant matter and smell of sulphur or similar. Marks were lost when candidates gave similar indicators such as poor plant growth and poor root systems.

Q2 a) State what the pH scale measures.

b) State the pH range that supports the growth of most temperate plants in mineral soils.

Marks were awarded for candidates who mentioned both Hydrogen ions and acidity and alkalinity; often only one was cited. The pH range was often very narrow (e.g. 6-6.5) and not reflecting the range that supports most temperate plants in mineral soils (5.5-7.5).

Q3 State **TWO** functions of magnesium in plant growth.

2

Most candidates correctly stated that Magnesium is essential for chlorophyll production and therefore has an important role to play in the process of photosynthesis / sugar production. However, very few candidates were able to provide a second, distinct function of this major nutrient including:

- its role in the process of respiration (ATP synthesis / energy production);

- as an enzyme activator ;
- its role in the active uptake of nutrients (phosphates and potassium).

General statements such as 'healthy plant growth' were not rewarded.

Q4 State **FOUR** factors which affect light transmission into greenhouses. **2**

This question was generally well answered with most scripts stating four factors. Some candidates lost marks if, for example, they answered 'glazing materials' and then 'polythene' as separate factors.

Q5 a) Name a tender plant normally overwintered in greenhouses in a **NAMED** region of the UK.

b) State the months between which protection is usually needed for the plant named in a). **2**

Region	
Start month	
End month	

Most candidates were able to give a suitable plant and the months it would require protection. However, marks were lost by those who failed to give a full botanical name, or gave seasons rather than months.

A few responses named annual bedding plants which were not acceptable.

Q6 List **FOUR** environmental factors which need to be considered when providing for the healthy growth of plants in an interior display. **2**

Mixed answers were given for this question; candidates who read the question clearly were able to comment on the **environmental** factors for an **interior** display, candidates who mentioned soil conditions or rainfall were not rewarded.

Q7 Name **ONE** hedging plant and state the pruning required immediately after planting. **2**

Answers to this question were variable. Candidates who were able to give the correct botanical name for a plant recognized for hedging and then state the corresponding pruning regime, e.g. prune to outward facing buds 10cm from the ground gained full marks. Unfortunately some candidates did not give the correct pruning method for the named plant.

Q8 State **ONE** fungal disease of a **NAMED** ornamental plant. **2**

Generally well answered. Most candidates correctly named a fungal disease, and an appropriate host (e.g. Rose rust on *Rosa* 'The Queen Elizabeth'). However, marks were lost where the plant named is mainly grown in the vegetable or fruit garden (e.g. Gooseberry - *Ribes uva-crispa*), or a bacterial disease (e.g. Cherry canker) was cited.

Q9 Name **TWO** plants suitable for **EACH** of the following aspects:

- i) north facing;
- ii) south facing.

2

Responses mainly gave correct plants; however marks were lost when the full botanical name was not given. It was disappointing that so many candidates gave *Hedera helix* as an example, possibly demonstrating a narrow knowledge of suitable plants.

Q10 List **FOUR** plants suitable for a spring display in a window box.

2

Most scripts suggested suitable plants whose main season of interest was in spring and were not too large to grow in a window box. A few candidates cited inappropriate examples such as summer-flowering plants.

Q11 a) Name **TWO** types of spiker tine which can be used for turf maintenance.

b) State the reason for the use of **ONE** of the tines named in a).

2

Better answers were given by candidates who named two tines e.g. solid and hollow, and then described the correct reason for using it. Answers about the use were variable and a number of candidates were unable to give specific reasons for ONE tine, often only mentioning aeration when describing a hollow tine. A number of (unrewarded) descriptions were received of rakes and scarification.

Q12 Using the table below, identify **TWO** advantages and **TWO** limitations of establishing lawns from turf compared to seed.

2

Advantages	
Limitations	

Candidates who gave specific advantages and limitations were awarded full marks. Often answers were too brief e.g. 'easier' or 'needs irrigation' which were insufficient to receive a mark.

Q13 State **ONE** symptom of the damage caused by **TWO NAMED** pests.

2

	<i>Pest</i>	<i>Symptom</i>
1		
2		

Generally well answered with a high proportion of answers being given to pest damage on food crops which was acceptable. Marks were lost if candidates gave a very brief symptom e.g. 'Slugs - holes in leaves'; the expectation would be for the candidate to enlarge on this by stating either the position of the holes or evidence of trails to gain full marks.

Q14 a) Define the term 'weed'.

b) State **TWO** ways in which weeds reduce plant productivity.

2

Mainly well answered with most candidates able to state that a weed is a plant growing in the wrong situation and that they compete for light, nutrients etc.

Q15 Using the table below, state **ONE** benefit and **ONE** limitation of the methods of pest control stated.

2

<i>Pest Control</i>	<i>Benefit</i>	<i>Limitation</i>
<i>Biological</i>		
<i>Chemical</i>		

Some variable answers to this question, better ones highlighting distinct benefits and limitations. Some candidates' responses were just 'better for the environment' contrasted with 'not so good for the environment'; fewer marks were awarded for this.

Many candidates stated biological control only worked in small areas, clearly this conflicts with its use in most modern commercial situations.

Section 2 – Structured Questions

Marks

- Q16**
- a) State the meaning of the term 'soil profile'. 2
 - b) Describe a typical soil profile. 4
 - c) Describe **FOUR** properties of top soil that contribute to the healthy growth of plants. 4

Candidates generally were able to explain the term 'soil profile' and were also able to name the four main layers (horizons), describing their origins and characteristics. Better candidates were able to draw clear distinctions between topsoil and subsoil.

Most scripts described the basic properties of topsoil but the more successful gave clear descriptions of four distinct properties and were able to explain how each of these specifically contributed to healthy plant growth. The degree of interrelation between each property, e.g. of organic matter levels with structure and nutrient status meant that the better descriptions were sharp and focused, avoiding omissions and excessive duplication.

- Q17**
- a) State **THREE** methods of determining when to water plants growing in containers. 3
 - b) Describe the benefits and limitations of **TWO** of the methods listed in a). 4
 - c) Describe **ONE** method of irrigating container-grown plants. 3

Most candidates were able to state three distinct simple practical methods of determining the need for watering containers, e.g. lifting the pot to assess the weight of water it contains. However there were a significant number of candidates who stated 'watering at regular time intervals regardless of need' as a method. This was not accepted. Descriptions of the necessary benefits and limitations were generally sound but the higher marks were only awarded for clear statements that were fully explained and specific to the particular method. Benefits such as 'easy to do' and limitations such as 'not giving a clear indication of need' were not considered to meet these criteria.

Any suitable method of irrigating container grown plants was accepted with full marks given for detail relating to the equipment, its operation and the particular effects of that method.

- Q18** Describe under the following headings, the production of a decorative pot plant:
- i) plant name; 1
 - ii) propagation and establishment; 4
 - iii) maintenance; 3
 - iv) control of **ONE** named pest and **ONE** named disease. 2

This question was about the production of a particular plant grown for indoor display. Appropriate subjects included *Saintpaulia ionantha* and *Hypoestes phyllostachya* and the better candidates gave the full botanical names of suitable plants.

Marks were awarded for correctness and level of detail in the descriptions. For example, 'propagation by leaf petiole cuttings' would, for the higher awarded candidates, have been accompanied by a clear description of the cutting, its preparation, the time of year, the

propagation equipment, temperature and rooting medium.

Most candidates mistook the meaning of maintenance, as stated in the question, for maintenance of a plant on display rather than maintenance of plants under production. Although many of the basic requirements would have been the same, and accredited accordingly, failure to describe e.g. the spacing of pots on a bench would have meant that some marks would not have been awarded.

Appropriate pests and diseases were generally named successfully with higher marks awarded for thoroughness in the description of one control method e.g. the name of a suitable pesticide, its timing and method of application, or for two control methods described less comprehensively.

Q19 *Describe the maintenance of a large, regularly used utility lawn under the following headings:*

- | | | |
|------|----------------------|----------|
| i) | <i>mowing;</i> | 2 |
| ii) | <i>feeding;</i> | 2 |
| iii) | <i>weed control;</i> | 2 |
| iv) | <i>aeration;</i> | 2 |
| v) | <i>top dressing.</i> | 2 |

For full marks, each of the headings required that a clear rationale was given for the particular maintenance operation and that this was followed by thorough description of how that operation would be performed throughout the annual maintenance of a utility lawn.

Good descriptions would have included details of materials and equipment used, timing, frequency and rates of application where appropriate, as well as the method of operation itself.

- Q20** a) *Name and describe **THREE** plants suitable for a dry soil.* **6**
- b) *State **FOUR** techniques which would reduce the need for irrigation in the establishment of a border.* **4**

Suitable plants would be those that, once initially established, would be expected to survive without irrigation in dry shade under trees (e.g. *Geranium macrorrhizum*), in an open sunny position on extremely free draining soils (e.g. *Lavandula angustifolia*), or on extremely heavy clay soils which crack in summer (e.g. *Lonicera pileata*).

Descriptions which earned full marks would have stated whether the plant was a tree, shrub, perennial, biennial or annual, whether it was evergreen or not; its likely height/spread after a certain period of time, its flowering time/fruiting time, and colours/textures/shapes of key ornamental features.

Methods of reducing the need for irrigation would have included the appropriate use of such suitable plants as well as ground preparation techniques, soil treatments and design applications to improve root growth, water catchment and retention. Many candidates stated 'close spacing of plants' as a method. However, though this can be said to increase the efficiency of watering, it does not reduce the need for it.

- Q21** a) *Define the term 'plant disease'.* **1**
- b) *Name **ONE** viral disease of plants:* **1**
- i) *state **TWO** methods by which the disease is spread;* **2**

- ii) *describe the damage this disease causes to plants;* **2**
- iii) *state **TWO** methods of minimising the spread of this disease.* **4**

Most candidates were able to define the term 'plant disease' but there were many who chose to name a disease which wasn't caused by a virus. In these cases no further marks, beyond that for the initial definition, could be awarded and those candidates achieved very low marks for the question.

Where a suitable subject was named, candidates generally showed reasonable knowledge of its spread, the damage it causes and methods of control. The better candidates, in describing the damage, also described the visual symptoms. They also chose two distinct methods of control and gave some explanation of how each worked.

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