RHS LEVEL 2 CERTIFICATE IN HORTICULTURE

Wednesday 24 June 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	Do not write in this margin
Q1	a)	Name **TWO** processes occurring within the plant which are part of the 'carbon cycle'.		
	b)	For **EACH** process named in a), state if carbon is being assimilated or released.	**2**	

Process	Assimilation/Release

Q2 a) Define the term 'soil pore space'.

b) State how the size of pore affects the amount of water and air held in the soil. **2**

……

……

……

……

……

Q3 List in order, **FOUR** operations involved in seedbed preparation, starting from an area of soil covered with large clods. **2**

……

……

……

……

……

Please see over …….

			Marks	Do not write in this margin
Q4	a)	State **TWO** ways of lowering the air temperature in a greenhouse.		
	b)	State **TWO** ways of raising the relative humidity in a greenhouse.	**2**	

……
……
……
……
……

Q5	a)	List **TWO** types of container used in plant production.		
	b)	List **TWO** types of material used for display containers.	**2**	

……
……
……
……
……

Q6		Name **ONE** half-hardy annual plant and state the month in which seed is sown in a heated greenhouse, to obtain an early summer display.	**2**	

……
……
……
……
……

		Marks	Do not write in this margin
Q7	State **TWO** methods of supplying nutrients to plants in hanging baskets.	**2**	

……

……

……

……

……

Q8	Describe the visual symptoms on a **NAMED** woody plant by a **NAMED** pest.	**2**	

……

……

……

……

……

Q9	Describe a planting technique for a **NAMED** bare rooted herbaceous plant.	**2**	

……

……

……

……

……

Q10 Explain why lawn sand is used and state **TWO** months when it is most effective. **2**

……

……

……

……

……

Q11 Name **FOUR** plants grown for their decorative fruits/berries. **2**

……

……

……

……

……

Q12 Name **ONE** plant of interest for **EACH** of the seasons listed. **2**

Season	**Plant**
spring	
summer	
autumn	
winter	

		Marks	Do not write in this margin
Q13	Name a bacterial disease and name **ONE** plant affected.	**2**	

……

……

……

……

……

Q14	State the damage caused to a **NAMED** plant affected by a **NAMED** virus disease.	**2**	

……

……

……

……

……

Q15	State **ONE** environmental and **ONE** economic limitation of using biological pest controls.	**2**	

……

……

……

……

……

****

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

RHS Registered Charity No: 222879/SC038262

RHS LEVEL 2 CERTIFICATE IN HORTICULTURE

Wednesday 24 June 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) Answer **THREE** questions only from Section 2;

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

iv) Start **EACH** 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 only from this section.

			Marks
Q16	a)	Define the term ‘green manure’.	**2**
	b)	Name **TWO** green manure crops.	**2**
	c)	Describe the benefits to soil conditions of growing green manure crops.	**6**
Q17	a)	Name **FOUR** materials used in the construction of protective structures and describe the characteristics of **EACH**.	**4**
	b)	Name **THREE** cladding materials and state **ONE** benefit and **ONE** limitation of **EACH**.	**6**
Q18	a)	Describe the characteristics of **TWO** aspects to be found in a walled garden.	**4**
	b)	Name **TWO** suitable plants for **EACH** aspect described in a). State **THREE** important horticultural features of **EACH** plant.	**6**
Q19	a)	Describe the pruning of newly planted bush roses and of a **NAMED** newly planted hedging plant.	**4**
	b)	Describe the pruning of established bush roses.	**6**

Please see over…….

Q20 a) Describe **FOUR** ways in which weeds can compete with cultivated plants. **4**

b) Define **EACH** of the following types of herbicide. Describe **ONE** horticultural situation in which **EACH** might be used:

i) residual; **2**
ii) contact; **2**
iii) translocated. **2**

Q21 a) Describe **EACH** of the symptoms of attack by **TWO NAMED** pests, on **ONE NAMED** plant. **6**

b) Describe **TWO** distinct methods of control for **EACH** of the pests named in a). **4**

****

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

RHS Registered Charity No: 222879/SC038262

RHS LEVEL 2 CERTIFICATE IN HORTICULTURE

24 June 2009

Horticulture II

Candidates Registered	1670	**Pass with Commendation**	653 (45.32)
Candidates Entered	1441	**Pass**	573 (39.76)
Absent/Withdrawn/Deferred	215	**Fail**	215 (14.92)
Total Candidates Passed	1226		

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

Examiners' Comments:

Section 1 - Short Answer Questions **Marks**

Q1 *a) Name **TWO** processes occurring within the plant which are part of the 'carbon cycle'.*

*b) For **EACH** process named in a), state if carbon is being assimilated or released.* ***2***

Process	***Assimilation/Release***

The majority of candidates understood that the question identified the role of the processes of Photosynthesis and Respiration within the Carbon cycle as the Assimilation and Release of CO_2. Other acceptable answers were Death and Chloroplasts, receiving ½ marks.

Q2 *a) Define the term 'soil pore space'.*

b) State how the size of pore affects the amount of water and air held in the soil. ***2***

a) Many good definitions were given identifying soil pores as spaces, gaps, or pores between soil aggregates, particles, etc.

b) Macropores containing air/water and Micropores containing mainly water needed to be identified or the permeability of contrasting soil types such as Sand – Clay and air /water relationship in their soil pores.

Q3 *List in order, **FOUR** operations involved in seedbed preparation, starting from an area of soil covered with large clods.* ***2***

Many candidates misinterpreted this question to deal with the complete method of soil preparation from first steps of digging to the final seed bed. They therefore included steps of digging, double digging and the incorporation of bulky organic matter.
The question wanted the final stages of soil preparation to include points such as: break down clods (using fork), remove weeds, rake level, firm to consolidate, fertilizer dressing, rake and level to tilth, ready for final sowing.
Points were to be in sequence to receive full marks.

Q4 *a) State **TWO** ways of lowering the air temperature in a greenhouse.*

*b) State **TWO** ways of raising the relative humidity in a greenhouse.* ***2***

Most candidates gave good answers:

a) Ventilation, irrigation practices, water tanks, shading
b) Heaters, irrigation, humidifiers, close vents, doors etc.

Two similar practices did not gain separate marks.
Mist & fogging units were regarded as specialist equipment, not practical operations, and were not rewarded.

Q5 *a) List **TWO** types of container used in plant production.*

*b) List **TWO** types of material used for display containers.* ***2***

Many good answers were seen including:
a) Modules, pots, seed trays, etc. (peat blocks were not allowed).
Containers needed to be for production, not final situations i.e. grow bags.
b) Mostly a good range of examples of containers e.g. metal, wood, plastic.
Hanging baskets were not accepted, neither were two examples of the same type of container e.g. metal - aluminium and steel.
A number of answers misinterpreted the question and gave examples of materials used in containers such as compost, soil, peat.

Q6 *Name **ONE** half-hardy annual plant and state the month in which seed is sown in a heated greenhouse, to obtain an early summer display.* ***2***

Many candidates had difficulty in identifying an example of a half-hardy annual. Examples of acceptable plants are Lobelia erinus, Tagetes etc.
Plants which are grown as half-hardy annuals were accepted. Calendula and Pelargonium examples = ½ marks.
The correct month needed to be identified in which the seed should be sown to be ready to plant out at the end of May.

Q7 *State **TWO** methods of supplying nutrients to plants in hanging baskets.* ***2***

There were many good answers. Most concentrated on the incorporation of slow/controlled release fertilizers such as Osmocote in the compost, also using a liquid feed or foliar feed over the growing season.
Two answers such as foliar feed and liquid feed were regarded as too similar to gain separate marks.

Q8 *Describe the visual symptoms on a **NAMED** woody plant by a **NAMED** pest.* ***2***

The question needed to be treated in 3 main parts: a named woody plant, a named pest of the plant and symptoms of the damage to the plant.
A number of answers mistakenly dealt with plant diseases.

Q9 *Describe a planting technique for a **NAMED** bare rooted herbaceous plant.* ***2***

A difficult question for many candidates, challenging their ability to understand and identify the name of an herbaceous plant. Many candidates interpreted bare rooted as meaning woody plants, again losing marks.
The plant needed to be identified to allow statements as to the correct planting depth/size hole, which varies with each type of plant. Other points included fertiliser incorporation and firming in. Nursery soil marks are used to determine the depth to plant woody subjects, not herbaceous.

Q10 *Explain why lawn sand is used and state **TWO** months when it is most effective.* ***2***

Candidates who identified that the use of lawn sand is mainly to control moss received the marks. Other acceptable answers were: acidification, to deter casting worms, to control some weeds.
The significance of the words in the question "2 months when most effective" were not realized by many candidates who used months in autumn as times for applying lawn sand. The season of peak growth is in spring and marks were gained for identifying these months.

Q11 *Name **FOUR** plants grown for their decorative fruits/berries.* ***2***

This question required candidates to name examples of 4 suitable plants with decorative fruits or berries. Plant naming was disappointingly vague in many scripts, with the consequent loss of marks.
Plants used for edible fruit such as raspberry were not rewarded**.**

Q12 *Name **ONE** plant of interest for **EACH** of the seasons listed.* ***2***

Season	***Plant***
spring	
summer	
autumn	
winter	

This question required 4 different plants appropriate for the 4 different seasons. Again, it was difficult to identify the plants being named in a large proportion of scripts with a consequent loss of marks. Conifers, leaf shape and variegation were not accepted. The plant had to have a specific interest within the specific season.

Q13 *Name a bacterial disease and name **ONE** plant affected.* ***2***

Candidates who identified the correct bacterial disease such as fireblight, bacterial canker etc. affecting the appropriate plant such as Malus, Pyracantha, Photinia; Malus, Prunus etc. were rewarded.
A number of answers identified fungal diseases which were not accepted

Q14 *State the damage caused to a **NAMED** plant affected by a **NAMED** virus disease.* ***2***

This question required a named plant, a named disease appropriate to the plant and symptoms of the disease showing on the plant to gain full marks e.g. mosaic disease for cucumbers or tomatoes – with appropriate symptoms. A number of candidates incorrectly gave fungal or bacterial diseases as examples. Some pests were also identified.

Q15 *State **ONE** environmental and **ONE** economic limitation of using biological pest controls.* ***2***

The question asked for limitations of biological control – not a definition or benefits.
Correct answers for economic limitations included biological not as effective as chemical controls; birds can affect beneficial insects; control can become pest itself. ½ marks were given for answers stating only used inside protected environment.
Responses could be about the cost, for a ½ mark, but more explanation was needed for full marks.

****

Section 2 – Structured Questions ***Marks***

Q16 *a) Define the term 'green manure'.* ***2***

*b) Name **TWO** green manure crops.* ***2***

c) Describe the benefits to soil conditions of growing green manure crops. ***6***

The great majority of candidates were able to clearly recognise that a green manure crop is grown specifically to be incorporated into the soil where it grew, and were also able to name two suitable crops for the purpose.
Benefits of green manures were also well covered by most, with note given to soil structure improvement, weed suppression, prevention of leaching and erosion, nutrient enhancement via nitrogen-fixing crops, higher levels of soil organism activity, all usually explained adequately.

Q17 *a) Name **FOUR** materials used in the construction of protective structures and describe the characteristics of **EACH**.* ***4***

*b) Name **THREE** cladding materials and state **ONE** benefit and **ONE** limitation of **EACH**.* ***6***

Most candidates who answered this question correctly focused on materials used for construction of greenhouses and polythene tunnels; a small number unfortunately misconstrued the question and instead reviewed fencing and hedging materials.
Wood, aluminium, steel, brick, glass, polythene and polycarbonate were the most common materials described; the term plastic was used as an alternative to polythene by a number of candidates, but marks were still awarded if it was clear that the intention was to describe polythene.

Q18 *a) Describe the characteristics of **TWO** aspects to be found in a walled garden.* ***4***

*b) Name **TWO** suitable plants for **EACH** aspect described in a). State **THREE** important horticultural features of **EACH** plant.* ***6***

The question required that aspects within a walled garden were described. Unfortunately a number of candidates misunderstood the term 'aspect', failing to recognise that it required the identification and description of e.g. north facing, south facing etc. walls. Scripts in this category were reviewed to determine if they gave any indication of the concepts of the question, and marks awarded accordingly.
Where the question was correctly understood the answers were satisfactory; north facing walls were described as being cold and shady, with plants late into growth; south facing walls were recognised as being warm, dry and early.
North-facing plants usually included Hedera helix; poor examples included Garrya, where candidates failed to note this as a somewhat delicate plant needing adequate sunshine to thrive. For south facing situations, some candidates offered sun-loving perennials, which were rewarded.

Q19 *a) Describe the pruning of newly planted bush roses and of a **NAMED** newly planted hedging plant.* ***4***

b) Describe the pruning of established bush roses. ***6***

Some of the principles of rose pruning were commonly noted by candidates – e.g. the removal of dead, diseased and damaged wood, cutting to an outward bud and keeping the centres open. Rather fewer recognised the need to hard-prune newly planted roses to ensure good establishment.
The pruning of established roses was covered to a similar level, where in addition to the points noted above most candidates noted the opportunity to undertake partial pruning in autumn and also the need to deadhead to prolong flowering. Timing of the operations was usually noted correctly.

Q20 *a) Describe **FOUR** ways in which weeds can compete with cultivated plants.* ***4***

*b) Define **EACH** of the following types of herbicide. Describe **ONE** horticultural situation in which **EACH** might be used:*

i) residual; ***2***
ii) contact; ***2***
iii) translocated. ***2***

The four main areas of weed competition were noted by most candidates (for nutrients, water, light and space) and were usually described satisfactorily.
Residual herbicides were usually noted as 'lasting' in the soil for a period of time and most candidates noted a suitable horticultural situation in which they could be useful.
Contact herbicides were also correctly described in terms of their action, but uses were less well-described; stale seedbed 'burn-off' was a common and suitable response.
Translocated herbicides were described correctly and most candidates identified a suitable use, e.g. as a selective within lawns, or to remove perennial weeds from shrub or herbaceous borders by touch weeding.

Q21 *a) Describe **EACH** of the symptoms of attack by **TWO NAMED** pests, on **ONE NAMED** plant.* ***6***

*b) Describe **TWO** distinct methods of control for **EACH** of the pests named in a).* ***4***

Full marks for part a) were gained where the candidate named a plant in full (i.e. with a stated cultivar for vegetables or fruit) and then followed this up with appropriate pests, effectively described.
Popular remedies for pests included hand-picking of caterpillars and use of a wide range of biological controls; use of insecticides, molluscicides etc. were mentioned rarely.

****