Royal Horticultural Society

RHS LEVEL 2 CERTIFICATE IN HORTICULTURE

Wednesday 15 February 2012
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.

ANSWER ALL QUESTIONS

MARKS

Q1 Name **ONE** organic and **ONE** inorganic straight (single) fertiliser which supplies potassium. **2**

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Q2 a) State **TWO** reasons for the use of green manures.

b) Name **TWO** plants used for this purpose. **2**

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Q3 Define **EACH** of the following terms:

i) field capacity;
ii) permanent wilting point. **2**

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Please see over/.....

MARKS

Q4 Name **FOUR** distinct types of protective structures for growing plants. **2**

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Q5 Describe **TWO** distinct methods of adding nutrients to plants grown under protection. **2**

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Q6 State **ONE** benefit and **ONE** limitation of **EACH** of the following materials when used for plant containers:

i) plastic;
ii) terracotta. **2**

Material	Benefit	Limitation
Plastic		
Terracotta		

MARKS

Q7 a) **NAME** a shrub grown for winter stem effect.

b) Describe how and when this plant should be pruned. **2**

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Q8 Name **FOUR** plants suitable for a winter display in a hanging basket. **2**

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Q9 a) Name **TWO** grasses suitable for a utility lawn.

b) State the height of cut for this mixture in summer. **2**

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Please see over/.....

MARKS

Q10 a) Name **ONE** deciduous tree suitable for inclusion in a small garden.

b) State **TWO** ornamental features of this plant. **2**

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Q11 State **TWO** benefits to herbaceous perennial plants of **EACH** of the following:

i) support;
ii) dead-heading. **2**

Procedure	**Benefit 1**	**Benefit 2**
Support		
Dead-Heading		

Q12 Define the term 'half-hardy' as applied to bedding plants and **NAME TWO** examples. **2**

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MARKS

Q13 a) Name **TWO** classes of weed.

b) State **ONE** distinct method of control for **EACH** class. **2**

Weed Class	Control

Q14 State the stages of the life cycle for a **NAMED** pest which has incomplete metamorphosis. **2**

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Q15 State **ONE** benefit and **ONE** limitation of biological control of plant pests. **2**

Benefit	Limitation

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Royal Horticultural Society

RHS LEVEL 2 CERTIFICATE IN HORTICULTURE

Wednesday 15 February 2012
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.

ANSWER THREE QUESTIONS ONLY FROM THIS SECTION

MARKS

Q16 a) State what is meant by soil structure. **2**

b) Describe **TWO** ways in which soil structure can be:

i) improved **AND** **4**
ii) damaged. **4**

Q17 a) Name **TWO** materials used in the cladding of growing structures for protected cropping. **2**

b) Describe **TWO** benefits and **TWO** limitations of its use for this purpose for **EACH** material named in a). **8**

Q18 a) Name **TWO** plants suitable for interior plant display. **2**

b) State **FOUR** environmental factors to be considered when selecting plants for such a display. **4**

c) Describe **FOUR** procedures used to maintain an interior plant display. **4**

Q19 a) Draw an outline sketch plan for a seasonal bedding display during summer. **2**

b) Name and describe **FOUR** plants suitable for inclusion **AND** indicate their positions on the plan. **4**

c) State the maintenance of the display for its duration. **4**

Please see over/.....

MARKS

Q20 a) State **THREE** characteristics of plants for informal hedging. **3**

b) List **THREE** suitable plants for informal hedging. **3**

c) Describe the establishment of **ONE** of the plants under the following headings:

i) site preparation; **2**
ii) planting. **2**

Q21 a) Define the term 'disease'. **1**

b) Name **ONE** bacterial disease of a **NAMED** plant. **2**

c) For the disease named in b), state:

i) method of infection; **2**
ii) symptoms of attack; **3**
iii) **ONE** method of minimising the damage caused. **2**

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RHS LEVEL 2 CERTIFICATE IN HORTICULTURE

15 February 2012

Horticulture II

Candidates Registered	74	**Pass with Commendation**	23 (53.49%)
Candidates Entered	43	**Pass**	12 (27.91%)
Absent/Withdrawn/Deferred	31	**Fail**	8 (18.6%)
Total Candidates Passed	35 (81.4%)		

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 *Name **ONE** organic and **ONE** inorganic straight (single) fertiliser which supplies potassium.* ***2***

A majority of candidates were able to name two suitable materials. Organic included: kelp meal, calcified seaweed, bonfire ash, fish blood and bone. However urea (inorganic), and bone meal (very low in Potassium) were not accepted. Inorganic (Straight) included Muriate of Potash (Potassium chloride) and Potassium sulphate.

Q2 *a) State **TWO** reasons for the use of green manures.*

*b) Name **TWO** plants used for this purpose.* ***2***

Many candidates correctly identified the addition of plant nutrients by Nitrogen fixation, prevention of nutrient leaching, improvement of moisture retention and soil structure by addition of organic matter.
Plants included: Mustard (*Sinapsis alba*); Rye (*Secale cereale*); Alfalfa (*Medicago sativa*); Clover (*Trifolium repens*); Comfrey (*Symphytum officinale*).

Q3 *Define **EACH** of the following terms:*

i) field capacity;
ii) permanent wilting point. ***2***

Good definitions were seen in some scripts. However some confusion was seen in some responses, wrongly defining field capacity as the maximum crop yield from a particular plot of land.
Field capacity is the maximum amount of water which can be held in a soil after drainage has taken place.
The permanent wilting point is the amount of water remaining in a soil when plants are no longer able to access it.

Q4 *Name **FOUR** distinct types of protective structures for growing plants.* ***2***

Most candidates were able to name four protective structures. For example: Cloches, Cold Frames, Glasshouses, Polythene Tunnels, Fruit cages etc.

Q5 *Describe **TWO** distinct methods of adding nutrients to plants grown under protection.* ***2***

Well covered by most candidates with the most popular answers describing the use of Controlled Release Fertilisers and liquid feeding. Re-potting in fresh compost and fertiliser top dressing were also rewarded.

Q6 *State **ONE** benefit and **ONE** limitation of **EACH** of the following materials when used for plant containers:*

i) plastic;
ii) terracotta. ***2***

Material	***Benefit***	***Limitation***
Plastic		
Terracotta		

Candidates were well aware of the benefits and limitations of the use of containers manufactured from different materials.
Plastic: benefits include: relatively inexpensive; relatively light in weight so easy to tranport; wide range of shapes and finishes available. Limitations include: light in weight which means more susceptible to damage by high winds when used out of doors; difficult disposal.
Terracotta: benefits include: aesthetically attractive; can blend easily with other garden features. Limitations include: breakable; porous - requiring more frequent watering; subject to frost damage.

Q7 *a) **NAME** a shrub grown for winter stem effect.*

b) Describe how and when this plant should be pruned. ***2***

Generally a well answered question. *Cornus alba 'Sibirica'*, and *Cornus sanguinea* were popular choices, with early spring pruning, (just before the plant comes into leaf) by coppicing.

Q8 *Name **FOUR** plants suitable for a winter display in a hanging basket.* ***2***

A wide range of acceptable plants were named; these were rewarded as long as they were small enough to be planted in a hanging basket, and winter hardy in the UK. A disappointing number of candidates failed to fully identify their plants according to the rubric, and were penalised accordingly.

Q9 *a) Name **TWO** grasses suitable for a utility lawn.*

b) State the height of cut for this mixture in summer. ***2***

Lolium perenne and *Poa pratensis* in mixture are suitable for utility lawns, for example, with a height of cut from 15 to 30 mm in summer.

Q10 *a) Name **ONE** deciduous tree suitable for inclusion in a small garden.*

*b) State **TWO** ornamental features of this plant.* ***2***

Many good suggestions were made but poor plant naming spoiled some answers, as did lack of plant knowledge in others.

Q11 *State **TWO** benefits to herbaceous perennial plants of **EACH** of the following:*

i) support;
ii) dead-heading. ***2***

Procedure	***Benefit 1***	***Benefit 2***
Support		
Dead-Heading		

Generally well answered. Support shows flowers to best advantage, and wind damage is minimised; dead heading may allow a second crop of flowers, reduce the incidence of disease or be more aesthetically pleasing.

Q12 *Define the term 'half-hardy' as applied to bedding plants and **NAME TWO** examples.* ***2***

Some good answers were seen, but many failed to define the term as relating to plants raised as annuals from seed, sown and grown-on under heated protection, and planted out in the open after the last frost. Good examples were provided in some cases, but many were not fully identified according to the rubric.

Q13 *a) Name **TWO** classes of weed.*

*b) State **ONE** distinct method of control for **EACH** class.* ***2***

Weed Class	***Control***

Generally well answered. Expected answers included: Ephemeral – hoe in dry weather prior to flowering; Perennial – use of translocated herbicides on mature plants.

Q14 *State the stages of the life cycle for a **NAMED** pest which has incomplete metamorphosis.* ***2***

Most candidates were able to name an insect pest, which is implied by the term – 'incomplete metamorphoses'. Descriptions of aphid life cycle were most popular, with mealy bug & whitefly also rewarded. Lepidoptera, leatherjackets, and vine weevils were not accepted.

Q15 *State **ONE** benefit and **ONE** limitation of biological control of plant pests.* ***2***

Benefit	***Limitation***

Candidates were generally aware of the benefits (e.g. pest specific, non-polluting, does not encourage the development of resistant strains) and limitations (time needed to establish population of predators, need for a closed growing environment, predators may become pests).

Section 2 – Structured Questions **Marks**

Q16 *a) State what is meant by soil structure.* ***2***

*b) Describe **TWO** ways in which soil structure can be:*

*i) improved **AND*** ***4***
ii) damaged. ***4***

a) Unfortunately some candidates failed to distinguish between 'soil structure' which is the combining of soil particles (sand, silt, clay) and humus (organic matter) to form peds, blocks, plates and crumbs which result in an intricate system of pores, cracks and channels within the soil, and 'texture' which is the distribution of particle sizes.

b) Many good recommendations were made concerning the improvement of soils. However the specific improvement of soil structure was less well covered in many scripts. In summary, soil structure can be improved by the addition of organic matter – better soil structure results by 'sticking' aggregates together. Addition of lime to clay soils causes flocculation (the aggregation of smaller particles to form stable 'crumbs').
Soil structure can be damaged by compaction resulting from walking / machinery on wet soils. Over-cultivation also causes damage due to the formation of cultivation pans.

Q17 *a) Name **TWO** materials used in the cladding of growing structures for protected cropping.* ***2***

*b) Describe **TWO** benefits and **TWO** limitations of its use for this purpose for **EACH** material named in a).* ***8***

Candidates attempting this question generally provided good answers, with two materials named (e.g. wood – either deal or Western Red Cedar, aluminium, steel, horticultural grade glass, polythene).
Benefits and limitations of some commonly used materials are as follows:
Wood:

- Benefits - aesthetically pleasing, good material to work with
- Limitations - high maintenance, limited life, weaker material so more is required to retain glass or alternative glazing material.

Aluminium:

- Benefits - light in weight, light in colour, low maintenance, easily extruded into complicated shapes, does not corrode, and is relatively strong
- Limitations - expensive to buy, needs to be used in conjunction with steel.

Horticultural glass:

- Benefits - good heat retention, good natural light transmission, long lasting
- Limitations - breaks easily and has health & Safety implications.

Polythene:

- Benefits - less expensive than glass, can be used to clad structures of a curved shape
- Limitations - limited life span, allows very limited ventilation, retains atmospheric moisture.

Rigid plastics:

- Benefits - good heat retention, easier to work
- Limitations - very expensive but good heat retention.

Q18 *a) Name **TWO** plants suitable for interior plant display.* ***2***

*b) State **FOUR** environmental factors to be considered when selecting plants for such a display.* ***4***

*c) Describe **FOUR** procedures used to maintain an interior plant display.* ***4***

Those candidates who could display good plant knowledge scored well on this question.

a) Plant names had to be unambiguous to receive full marks.

b) Environmental requirements were not always given, with a tendency to stray into discussion of cultural needs. (For example: relative humidity, light level, irrigation method, and growing media.)

c) Better candidates discussed cultivation procedures here. (For example: irrigation, feeding or nutrition, trimming, dusting and polishing, pest and disease identification and control.)

Q19 *a) Draw an outline sketch plan for a seasonal bedding display during summer.* ***2***

*b) Name and describe **FOUR** plants suitable for inclusion **AND** indicate their positions on the plan.* ***4***

c) State the maintenance of the display for its duration. ***4***

This was a relatively unpopular question, although some excellent answers were seen.

a) Diagrams likewise varied from outstanding to poor. A plan with edging, ground, and dot plants suitably displayed, was expected.

b) Most candidates could not name fully four plants suitable for such a display, and descriptions were often not clear.

c) Maintenance was only covered in the most general way, which could not be fully rewarded.

Q20 *a) State **THREE** characteristics of plants for informal hedging.* ***3***

*b) List **THREE** suitable plants for informal hedging.* ***3***

*c) Describe the establishment of **ONE** of the plants under the following headings:*

i) site preparation; ***2***
ii) planting. ***2***

Some candidates demonstrated the degree of plant knowledge needed to answer this question well, but many scripts were disappointing in this respect.

a) Characteristics included: slow growing, attractive flowers, little pruning needed, evergreen.

b) Many plant suggestions were excessively vigorous, for example *Fagus sylvatica*.

c) Generally well covered, although recommended plant spacing varied widely.

Q21 *a) Define the term 'disease'.* ***1***

*b) Name **ONE** bacterial disease of a **NAMED** plant.* ***2***

c) For the disease named in b), state:

i) method of infection; ***2***
ii) symptoms of attack; ***3***
*iii) **ONE** method of minimising the damage caused.* ***2***

A well answered question, with many candidates having a good knowledge of at least one bacterial disease of plants.

a) Many candidates correctly identified a plant disease; for example: an organism which is detrimental to plant health. Viruses, bacteria and fungi can all cause plant disease.

b) Most candidates could name a bacterial disease and a plant attacked. Popular choices included: fireblight on *Pyrus*, *Cretaegus* or *Pyracantha;* plum canker of *Prunus* spp.

c) The method of infection was adequately covered in most scripts, although many failed to mention splash dispersal of bacterial slime.

d) Hygienic removal of affected parts represents the only practical way to attempt control. Sterilisation of cutting implements is to be recommended between pruning cuts, as is burning of the arisings.

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