



RHS LEVEL 2 CERTIFICATE IN HORTICULTURE

Wednesday 16 February 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** a) List **TWO** adverse effects on the environment of the overuse of fertilisers.
- b) Describe how the **TWO** effects listed in a) may be minimised in horticultural practice.

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- Q2** State **TWO** differences between topsoil and subsoil, using the table below:

2

Topsoil	Subsoil

- Q3** State **FOUR** characteristics of 'loam' soil texture.

2

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Please see over

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- Q4** State **THREE** benefits of growing a **NAMED** crop under protection compared to the same crop outdoors.

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- Q5** Using the table below, state **TWO** health and safety hazards related to working in a protected environment. State **ONE** method to control the risk associated with the **TWO** hazards identified.

2

Hazard	Method of risk reduction

- Q6** List **FOUR** ways that air temperature can be controlled in a greenhouse.

2

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Please turn over

Q7 Name and describe **ONE** evergreen climber, and **ONE** deciduous climber.

2

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Q8 List **FOUR** maintenance tasks carried out on a summer display of half-hardy annuals in a container.

2

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Q9 Define the term 'hardy annual' and give **TWO NAMED** examples.

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Marks

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Q10 Name **TWO** grass species suitable for use in a fine quality lawn.

2

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

2

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Q12 Name a summer-flowering shrub and state a month in which it should be pruned.

2

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Please turn over

Marks

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Q13 State **TWO** ways in which horticultural practice can help to avoid plant health problems.

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Q14 a) Define the term 'pest'.

b) State **THREE** methods of controlling and minimising the effects of pests.

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Q15 a) Define the term 'physiological disorder'.

b) Name **TWO** physiological disorders.

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RHS LEVEL 2 CERTIFICATE IN HORTICULTURE

Wednesday 16 February 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 pan'.	1
	b) List TWO distinct types of soil pan.	2
	c) Describe how EACH of the types of pan listed in b) is formed.	4
	d) State THREE effects of soil pans on plant growth.	3
Q17	a) List FOUR environmental factors and state how they differ between a protected cropped environment and outside.	4
	b) Explain what effect THREE of these environmental factors will have on growing a NAMED decorative pot plant.	6
Q18	a) Name and describe THREE herbaceous perennial plants suitable for an informal herbaceous border.	3
	b) Describe the maintenance of an herbaceous border using EACH of the following headings:	
	i) weed control methods;	4
	ii) supporting plants.	3
Q19	a) Name and describe TWO hedging plants.	4
	b) Describe the establishment of ONE plant selected from those named in a), using EACH of the following headings:	
	i) site preparation;	2
	ii) planting;	2
	iii) initial aftercare.	2

Please see over

- Q20** For a **NAMED** insect plant pest:
- i) state if it is an example of a complete or incomplete metamorphosis life cycle; **2**
 - ii) identify **TWO** distinct symptoms of the damage caused to plants; **2**
 - iii) describe **ONE** chemical, **ONE** biological and **ONE** cultural method of control. **6**
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- Q21**
- a) Name **THREE** common garden weeds, each with a different life cycle. **3**
 - b) Name **ONE** of the examples from a) and describe:
 - i) how it reproduces naturally; **3**
 - ii) how it may be controlled using **TWO** of the following methods: physical, cultural or chemical. **4**

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RHS LEVEL 2 CERTIFICATE IN HORTICULTURE

16 February 2011

Horticulture II

Candidates Registered	554	Pass with Commendation	185 (47.44%)
Candidates Entered	390	Pass	146 (37.44%)
Absent/Withdrawn/Deferred	164	Fail	59 (15.13%)
Total Candidates Passed	331 (84.88%)		

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:

Section 1 - Short Answer Questions

Marks

- Q1** a) List **TWO** adverse effects on the environment of the overuse of fertilisers.
- b) Describe how the **TWO** effects listed in a) may be minimised in horticultural practice.

2

Many responses showed a full appreciation of the consequences of the overuse of fertilisers. However a significant number of candidates lost marks as they failed to answer BOTH a) and b). There was also a suggestion in some scripts that 'organic' fertilisers have no adverse effects on the environment when overused, which is not true. Answers to part b) were rewarded when they related to such issues as the evaluation of crop requirements and the selection of suitable conditions and timing of application.

- Q2** State **TWO** differences between topsoil and subsoil, using the table below:

2

Topsoil	Subsoil

Well answered by most candidates, who listed characteristics such as:

Characteristic	Top soil	Sub-soil
Colour	Darker	Lighter
Aeration	Greater	Less
Structure	More structured	Less structured
Organisms	More	Less

Q3 State **FOUR** characteristics of 'loam' soil texture.

2

Most candidates were able to state four characteristics of a 'loam' soil texture:

- Wide range of particle sizes, relatively evenly distributed
- Retains water well
- Well aerated / free draining
- Retains added nutrients well
- Organic matter broken down relatively slowly.

Q4 State **THREE** benefits of growing a **NAMED** crop under protection compared to the same crop outdoors.

2

Many good answers were seen, although a disappointing number of candidates failed to read the question, and did not name a crop.

Correct answers included:

- Longer harvest season
- More 'tender' cultivars can be grown
- Less susceptible to disease e.g. tomato blight
- Easier to apply biological pest controls

Q5 Using the table below, state **TWO** health and safety hazards related to working in a protected environment. State **ONE** method to control the risk associated with the **TWO** hazards identified.

2

Hazard	Method of risk reduction

Responses to this question were surprisingly poor, considering the emphasis placed on health and safety both in the home and the workplace in recent years. Many candidates failed to apply their observations to the hazards to be met in a protected environment.

Typical topics included: tripping over hoses, breakage of glass, slippery surfaces, and issues concerning high temperatures, the presence of toxic fumes, and the chemical application in poorly ventilated spaces.

Q6 List **FOUR** ways that air temperature can be controlled in a greenhouse.

2

A very large number of correct lists were seen. Correct answers included:

- Open vents
- Shading
- Turn on / off heating
- Use of fans

Q7 Name and describe **ONE** evergreen climber, and **ONE** deciduous climber. **2**

Many candidates were able to fully name one evergreen and one deciduous climber, and state at least two important characteristics of each. Marks were forfeited where unambiguous botanic names were not given, and where less than two important features were described for each plant.

Q8 List **FOUR** maintenance tasks carried out on a summer display of half-hardy annuals in a container. **2**

Most candidates showed themselves fully familiar with the maintenance of summer displays in containers.

- Weeding
- Feeding
- Watering
- Dead heading
- Rotation to obtain even growth
- Control of Pests and Diseases

Q9 Define the term 'hardy annual' and give **TWO NAMED** examples. **2**

Many full and correct definitions were seen, but marks were lost by those candidates who failed to fully define a hardy annual as a plant which is sown without protection AND completes its life cycle in one growing season. Some candidates had difficulty naming suitable examples (e.g. *Salvia horminum*, and *Calendula officinalis*).

Q10 Name **TWO** grass species suitable for use in a fine quality lawn. **2**

Those candidates fully naming two suitable grasses for the establishment of a non-utility (fine) lawn, received full marks. Examples included *Festuca rubra* and *Agrostis tenuis*.

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

Most responses named four plants. However a significant proportion gave common names, which could not be fully rewarded.

Q12 Name a summer-flowering shrub and state a month in which it should be pruned. **2**

A large number of summer flowering shrubs were correctly quoted in response to this question. Again, candidates lost marks by failing to observe the rubric, and provide unique botanical plant names. A significant proportion also named a pruning season rather than a month, losing marks as a result.

Q13 State **TWO** ways in which horticultural practice can help to avoid plant health problems. **2**

Some excellent responses were seen, although some were excessively detailed. Correct answers included:
Companion Planting. A technique providing alternative hosts for pests which are therefore attracted away from the crop.
Crop Rotation. Used to maximise fertiliser use by reducing imbalances in plant nutrients.

- Q14** a) *Define the term 'pest'.*
- b) *State **THREE** methods of controlling and minimising the effects of pests.* **2**

Most responses correctly defined a pest as an animal whose activities has a detrimental effect on plant growth. Control methods included Cultural (e.g. the use of resistant varieties), Physical (e.g. the use of a 'fruit cage' to exclude birds), and Chemical (e.g. the use of pesticides).

- Q15** a) *Define the term 'physiological disorder'.*
- b) *Name **TWO** physiological disorders.* **2**

A majority of candidates provided correct answers. However a significant proportion were unable to define a physiological disorder, and as a result were not rewarded. Some mention of disease-like symptoms, not caused by an organism, was expected. Examples include Nitrogen deficiency, drought, scorch.

	Section 2 – Structured Questions	Marks
Q16	a) <i>Define the term 'soil pan'.</i>	1
	b) <i>List TWO distinct types of soil pan.</i>	2
	c) <i>Describe how EACH of the types of pan listed in b) is formed.</i>	4
	d) <i>State THREE effects of soil pans on plant growth.</i>	3

Some excellent responses were seen to this question.

Unfortunately, however, some candidates defined a surface cap as a soil pan, and went on to use this example for the remainder of the question, losing most of the marks.

- a) A compact, horizontal layer of soil in the soil profile, which restricts or prevents movement of water, air and plant roots down the profile. It is not a surface cap.
- b) A plough pan, a clay pan, a compacted pan due to excess traffic and or a iron pan.
- c) Continual cultivation (particularly rotary) to the same depth, excessive machinery/foot traffic on surface of wet soils, over cultivation resulting in clay particles moving down the profile and forming an impervious layer. Movement and accumulation of iron and/or organic matter down the profile, with subsequent accumulation, characteristic of acidic soils.
- d) The effects of a pan can restrict or prevent drainage causing localised anaerobic conditions which may lead to stunted growth and chlorotic leaves. Anchorage and stability of taller plants may be affected due to reduced root depth.

- Q17** a) List **FOUR** environmental factors and state how they differ between a protected cropped environment and outside. 4
- b) Explain what effect **THREE** of these environmental factors will have on growing a **NAMED** decorative pot plant. 6

This was not a popular question. Unfortunately, some of those who did answer it did not gain many marks.

- a) Candidates were able, in the main, to list four factors from air temperature, carbon dioxide level, rain fall, air movement, light and humidity. However how the chosen factors differed from the outside environment was poorly stated in many scripts.
- b) Candidates had to explain the effect of three of these factors on the growing of a named decorative pot plant. Several failed to name the pot plant so lost most of the marks as their answers could not be matched against a subject.

- Q18** a) Name and describe **THREE** herbaceous perennial plants suitable for an informal herbaceous border. 3
- b) Describe the maintenance of an herbaceous border using **EACH** of the following headings:
- i) weed control methods; 4
- ii) supporting plants. 3

Some excellent answers were seen, from those candidates who had a good working plant knowledge.

- a) Candidates had to name and describe three herbaceous perennial plants suitable for an informal herbaceous border. Candidates who answered this question usually named correctly the plants selected, however descriptions were where many lost marks as height, flower colour, and flowering time were not always stated or correct.
- b) Candidates had to describe the maintenance using each of the following headings:
- i) Weed control methods. Answers should relate to maintenance not ground preparation and initial planting. Hoeing, hand weeding, mulching and pesticide weed control was all acceptable. Discussions on frequency of hoeing and hand weeding should have been stated and type of weeds these methods would be used on. The type and depth of mulch and when it was applied should have been given and again what type of weeds it would control. Pesticide name or type should have been given, how and when it was applied and what safety precautions were to be observed.
- ii) Supporting plants. Candidates needed to discuss the various methods of supporting herbaceous plants and marks were gained when description of the various methods were stated. i.e. hazel or similar type twigs inserted around the plant as it commences growth in the spring so the plants will grow up through the twigs and gain support, bamboo canes or dahlia stakes inserted near or around the plants and string etc either used to support one plant to the stake or wrapped around the stakes to form a framework to support the plants. Wire or plastic coated hooped supports placed close to the plants as they start to grow. Unfortunately several candidates mistook "supporting plants"

to mean watering, pest control and weeding. No reward was given for this interpretation.

- Q19** a) Name and describe **TWO** hedging plants. 4
- b) Describe the establishment of **ONE** plant selected from those named in a), using **EACH** of the following headings:
- i) site preparation; 2
 - ii) planting; 2
 - iii) initial aftercare. 2

This was a popular question and in several cases high marks were gained.

- a) Candidates generally did well naming suitable plants. However descriptions were less satisfactory. Descriptions were often vague, failing to record where appropriate, flowering time and colour, berry colour, growth rate etc.
- b) Unfortunately several candidates failed to name the plant they had selected.
 - i) Site preparation. Answers should have discussed weed control, initial preparation by digging, incorporation of organic matter, addition of base dressing, consolidation and the width of ground being prepared.
 - ii) The planting method adopted should relate to the subject chosen and whether it was pot grown or supplied bare rooted. In all cases a line was required to be laid along the proposed hedge line. The description for pot grown should have stated that single holes should be taken out, the pot removed and the plant inserted up to the line at the correct depth, soil replaced and firmed in. Marks would also have been gained if it was stated that any weeds and damaged or dead material removed and that it was watered several hours before planting. Bare rooted plants should be planted in a trench and again against the line, soil replaced and firmed in. In both cases planting distances and planting time were required. Initial pruning could have been discussed depending on subject selected.
 - iii) Marks for initial aftercare included watering after planting if required and through the first summer following planting, pruning of any damaged growth, replacement of any subjects which have died, weed control and mulching of ground along the hedge line.

Q20 For a **NAMED** insect plant pest:

- i) state if it is an example of a complete or incomplete metamorphosis life cycle; 2
- ii) identify **TWO** distinct symptoms of the damage caused to plants; 2
- iii) describe **ONE** chemical, **ONE** biological and **ONE** cultural method of control. 6

A generally well answered question.

- i) Most candidates named an insect and also stated correctly if the life cycle was complete or incomplete.
- ii) Two distinct symptoms were less well answered, especially those selecting vine weevil who did not clearly describe the difference of larval and adult damage.
- iii) The chemical control method selected was usually appropriate but some should be aware of the withdrawal of certain pesticides. Biological control was well answered and usually was appropriate for the insect pest named. Cultural control was often confused with physical methods. In all cases statements as to timing were expected as this is an essential consideration for successful pest control.

- Q21** a) Name **THREE** common garden weeds, each with a different life cycle. **3**
- b) Name **ONE** of the examples from a) and describe:
- i) how it reproduces naturally; **3**
 - ii) how it may be controlled using **TWO** of the following methods: physical, cultural or chemical. **4**

This was a popular question for which high marks were awarded in many cases.

- a) Candidates had to name three common garden weeds, each with a different life cycle. Marks were awarded for the weed naming only but they must have represented different life cycles. Where candidate named two perennial weeds for example only one mark was gained.
- b) Candidates had to name one of the examples from a) and describe:
 - i) How it reproduces naturally. This was well answered: candidates stating clearly how this happens.
 - ii) How it may be controlled using two of the following methods: physical, cultural, or chemical. Where physical was selected most stated hoeing, hand weeding or forking out but it would have been advantageous to state the timing of these operations in relation to the weed growth or time of year. Where physical was selected candidates could have stated mulching, geo-textile or close planting as examples stating mulch material and depth, geo-textile material and when placed in position and an example of how close planting would work. If chemical was selected, the type or name of chemical to use, timing and stage of growth were required.

In all cases the answer needed to relate to the weed selected from those named in a)

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