Candidate Number:……

Candidate Name:……

Centre Number/Name:……

RHS LEVEL 3 ADVANCED/DIPLOMA IN HORTICULTURE
WRITTEN EXAMINATION

10:00am Wednesday 4th July 2007

IMPORTANT – Please read carefully before commencing.

i) The duration of the papers in Module **D** is **2 hours**.
ii) Answer **ALL** questions in Section **A**.
iii) **ALL** questions in Section **A** carry equal marks.
iv) Write your answers legibly in the spaces provided.
v) Use metric measurements **ONLY**.
vi) Where plant names are required, they should include genus, species and where appropriate cultivar.

MODULE D

Outdoor Plant Production
Protected Plant Production

Section A – Short Answer Questions

Please turn over/…..

ANSWER ALL QUESTIONS

MARKS

Q1 State **TWO** methods of cooling freshly harvested outdoor vegetables. Name **ONE** vegetable suitable for **EACH** method. **2**

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Q2 State **FOUR** reasons for carrying out soil analysis at regular intervals for protected crops. **2**

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Q3 State **FOUR** problems associated with excess rainfall in top fruit production. **2**

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Q4 List **FOUR** methods of extending the harvest season of outdoor strawberries. **2**

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Please see over/…..

ANSWER ALL QUESTIONS

MARKS

Q5 State **FOUR** different methods of propagating pot plants, naming a specific plant example in **EACH** case. **2**

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Q6 List **FOUR** different storage methods available for vegetable crops. **2**

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Q7 List **FOUR** methods of determining when plants in containers require watering. **2**

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Q8 Explain why **THREE** different apple cultivars should be planted in an orchard when one cultivar is triploid. **2**

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ANSWER ALL QUESTIONS

MARKS

Q9 List **FOUR** possible risks that should be assessed for people working in greenhouses. **2**

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Q10 List **FOUR** environmental factors, which may be controlled in the storage of cut flowers prior to marketing. **2**

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RHS LEVEL 3 ADVANCED/DIPLOMA IN HORTICULTURE
WRITTEN EXAMINATION

10:00am Wednesday 4th July 2007

IMPORTANT – Please read carefully before commencing.

i) The duration of the papers in Module **D** is **2 hours**.
ii) Answer **TWO** questions from Section **B** and **ONE** question from Section **C**.
iii) **ALL** questions carry equal marks.
iv) Write your answers legibly in the answer booklets provided.
v) Use metric measurements **ONLY**.
vi) Where plant names are required, they should include genus, species and where appropriate cultivar.

MODULE D

Outdoor Plant Production
Protected Plant Production

Sections B & C

Structured Questions

Please turn over/…..

Section B – Outdoor Plant Production

Answer TWO questions from this section

MARKS

Q1 Describe the container production of a **NAMED** perennial climbing plant under **EACH** of the following headings:

i)	propagation;	**6**
ii)	potting;	**6**
iii)	growing on;	**6**
iv)	pest and disease control.	**2**

Q2 Describe the commercial production of a **NAMED** edible *Allium* under **EACH** of the following headings:

i)	propagation methods;	**6**
ii)	field preparation;	**4**
iii)	crop maintenance and harvesting;	**6**
iv)	symptoms and control of **ONE** pest and **ONE** disease.	**4**

Q3 a) List **FOUR** conditions which have to be satisfied for a grower to qualify for 'organic' status. **8**

b) Explain the main differences in the field production for **ONE NAMED** crop by organic and non-organic methods. **12**

Q4 Explain how **EACH** of the following will affect the growing and crop production of a **NAMED** top fruit:

i)	selection of rootstock;	**5**
ii)	pollination and fertilisation;	**5**
iii)	irrigation and nutrition;	**5**
iv)	pruning method.	**5**

Please see over/…..

Section C – Protected Plant Production

Answer ONE question only from this section

MARKS

Q5 a) List **FOUR** different types of protective structures. **4**

b) Describe **ONE** benefit of **EACH** structure in the production of protected crops listed in a). **8**

c) Explain how different cladding materials may affect light transmission and heat loss in protective structures. **8**

Q6 Describe how the effectiveness of pest control may be influenced by the choice of a **NAMED** salad crop using **EACH** of the following methods:

i) biological control; **6**
ii) cultural control; **6**
iii) integrated pest management. **8**

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RHS LEVEL 3 ADVANCED/DIPLOMA IN HORTICULTURE
WRITTEN EXAMINATION

Wednesday 4th July 2007

MODULE D

Outdoor Plant Production
Protected Plant Production

Examiners Report

Candidates Registered	72				
			Total Candidates Passed		
Candidates Entered	64	88.88%	Passed with Commendation	34	53.12%
Candidates Absent	5	6.94%	Passed	25	39.06%
Candidates Deferred	2	2.78%	Failed	5	7.81%
Candidates Withdrawn	1	1.4%			

Section A – Short Answer Questions

Q1 State **TWO** methods of cooling freshly harvested outdoor vegetables. Name **ONE** vegetable suitable for **EACH** method.

Candidates gained full marks by giving TWO methods of cooling freshly harvested vegetables with TWO relevant examples. Several candidates gave the example of vacuum cooling for lettuce and hydro-cooling for carrots, but several other examples, including ice bank cooling were relevant.

Q2 State **FOUR** reasons for carrying out soil analysis at regular intervals for protected crops.

Candidates appreciated the need for regular analysis to check the levels of nitrogen, phosphate, potash and magnesium. Soil conductivity, especially where lettuce follows tomatoes, and pH were also given. Test for specific pests and diseases are not normally carried in regular tests unless there has been a history of a problem.

Q3 State **FOUR** problems associated with excess rainfall in top fruit production.

Answers receiving high marks included problems with pollination and the increased risk of fungal diseases. The restriction in suitable days for spraying and the dangers associated with the use of ladders also gained marks. Leaching of nutrients and water logging of orchards were also acceptable.

Q4 List **FOUR** methods of extending the harvest season of outdoor strawberries.

Candidates had the opportunity to select from a choice of varieties, cold stored runners, fleece cover, low or Spanish tunnels. Marks were not awarded where candidates listed, mid-season and late varieties as 3 separate methods.

Q5 State **FOUR** different methods of propagating pot plants, naming a specific plant example in **EACH** case.

Some candidates failed to gain marks by failing to give relevant answers such as including strawberries and herbaceous perennials. Good examples included Begonia Rex from leaf blade cuttings, Cyclamen persicum from either seed or corms and Ficus elastica decora by air layering.

Q6 List **FOUR** different storage methods available for vegetable crops.

Failure to read the question carefully resulted in candidates failing to gain marks by giving apples as an example instead of vegetables. Correct methods included storage in the ground by covering carrots with black polythene. The use of clamps, storing in sheds at temperatures just above freezing and refrigerated stores. Although specific vegetable examples were not asked for several candidates included this detail in their answers.

Q7 List **FOUR** methods of determining when plants in containers require watering.

Several candidates selected visual observation – foliage wilting, inspection of the root ball, weight of the plant and checking the micro-climate around the plants. Float gauges and the use of computer readings were also accepted.

Q8 Explain why **THREE** different apple cultivars should be planted in an orchard when one cultivar is triploid.

Candidates gained full marks by explaining that triploids are poor pollinators and have 3 sets of chromosomes. Most apple varieties are diploid and it would be essential for one diploid variety A to pollinate the triploid and diploid B, and diploid B to pollinate A. There were some excellent answers where candidates correctly named suitable varieties, although not actually asked for.

Q9 List **FOUR** possible risks that should be assessed for people working in greenhouses.

The possible risks in this question basically referred to Health and Safety working situations relevant to people working in greenhouses. Most candidates obtained good marks by listing the risk injury from broken glass, extreme working temperatures, chemical sprays, faulty equipment and lifting excessive weights.

Q10 List **FOUR** environmental factors, which may be controlled in the storage of cut flowers prior to marketing.

FOUR environmental factors which may be controlled in the storage of cut flowers prior to marketing included relative humidity, temperature, avoidance of draughts, excessive respiration, avoidance of a build up of ethylene and keeping the flowers out of direct sun. Some candidates included the need for adequate moisture and the use of chemical preservatives added to the water.

Section B – Outdoor Plant Production

Q1 Describe the container production of a **NAMED** perennial climbing plant under **EACH** of the following headings:

v) propagation;
vi) potting;
vii) growing on;
viii) pest and disease control.

Where candidates had clearly demonstrated in their answers some experience of growing plants, high marks were awarded.
High marks were also awarded to answers where there were clearly labelled diagrams accompanied by concise details which included information on suitable composts for potting up and potting on; details of propagation and growing temperatures; details of weaning and hardening off; and appropriate pest and disease control for the plant selected.

Q2 Describe the commercial production of a **NAMED** edible *Allium* under **EACH** of the following headings:

v) propagation methods;
vi) field preparation;
vii) crop maintenance and harvesting;
viii) symptoms and control of **ONE** pest and **ONE** disease.

Candidates selected either onions or leeks.
Candidates who gave concise details of propagation methods and timing of seed sowing received high marks for this part of the question.
Field preparation before sowing or planting was well understood by most candidates and received high marks.
Crop maintenance was well answered by those candidates that chose to answer this question, concentrating on weed control and harvesting methods.

Q3 a) List **FOUR** conditions which have to be satisfied for a grower to qualify for 'organic' status.
Most candidates were able to list the conditions required for organic status.

b) Explain the main differences in the field production for **ONE NAMED** crop by organic and non-organic methods.

Candidates gaining highest marks were those who clearly named an appropriate crop for which they were comparing production methods. They then gave clear accounts of the differences between the field production of organic and non-organic crops which included methods of planting, general maintenance and harvesting of both production methods.

Q4 Explain how **EACH** of the following will affect the growing and crop production of a **NAMED** top fruit:

v) selection of rootstock;
vi) pollination and fertilisation;
vii) irrigation and nutrition;
viii) pruning method.

Many candidates did not accurately NAME a top fruit ie. Malus Discovery.
Few answers were able to show the candidate had a thorough knowledge of the effects on crop production of the rootsock, ie. The link between soil type, cultivar and planned crop density, and ultimate size of tree. Few candidates also mentioned the connection with earliness of cropping, yield, quality and picking from the ground.
Pollination and fertilisation were confused by many candidates, few answers were able to accurately and fully explain the significance of ploidy triploids and diploids in apples.
Few answers included the significance of biennial – bearing, partial – fertilisation, self – fertility and self- infertility.
Pollination groups and the temperature effect on pollinators, such as bees were usually mentioned.
Some candidates did not answer the question and concentrated on explaining how to prune, rather than the effects of pruning on crop production.
The answer should have included comments on pruning method(s) to achieve balanced growth, fruit bud / vegetative growth, the removal of dead, diseased and damaged growth, because of its effect on yield, pruning to admit light and improve the ripening of fruit and fruiting wood for the following season, regulated, renewal and summer pruning, their timing and effect on yield and quality of crop.

Section C – Protected Plant Production

Q5 a) List **FOUR** different types of protective structures.

Most candidates were able to list four types of protective structure. Some however just described shelter such as wind breaks and hedges and others mentioned a multi-span rather than naming a particular type of structure.

b) Describe **ONE** benefit of **EACH** structure in the production of protected crops listed in a).

Candidates failed to gain marks on this part of the question where they simply listed the benefits and did not describe them in relation to crop production.

c) Explain how different cladding materials may affect light transmission and heat loss in protective structures.

Some candidates confused structures with cladding materials and others dealt with a very limited number of cladding materials. Generally the third part of this question was answered well with good explanations of the effect cladding materials have on light transmission and heat loss.

Q6 Describe how the effectiveness of pest control may be influenced by the choice of a **NAMED** salad crop using **EACH** of the following methods:

iv) biological control;
v) cultural control;
vi) integrated pest management.

Most candidates misinterpreted this question with very few describing how the choice of crop would effect the control of pest using the method listed. Descriptions of how the three methods of pest control could be used were provided in the answers with some but very limited reference to specific crops. The principle of integrated pest management was well understood by most candidates who provided good examples to support their descriptions given.