



Candidate Number: .....

Candidate Name: .....

Centre Number/Name: .....

**RHS LEVEL 3 DIPLOMA IN HORTICULTURE  
WRITTEN EXAMINATION**

**10:00am Thursday 5<sup>th</sup> July 2007**

**IMPORTANT – Please read carefully before commencing.**

- i) The duration of the papers in Module **F** 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 F**

**Ecology & Environment  
Resource Management**

**Section A – Short Answer Questions**

**Please turn over/.....**

## ANSWER ALL QUESTIONS

MARKS

- Q1** State **TWO** factors to consider when replacing an existing beech hedge, assuming hotter, drier summers become more frequent within the UK.

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- Q2** Define a halophyte and describe **TWO** of its major characteristics.

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- Q3** State how plant communities can respond to environmental stresses.

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- Q4** Distinguish between allogenic and autogenic succession.

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Please see over/.....

## ANSWER ALL QUESTIONS

MARKS

- Q5** Describe **ONE** method of pricing **EITHER** a horticultural product, **OR** a horticultural service.

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- Q6** Define the terms 'Hazard' and 'Risk' and relate **EACH** to an area of horticulture resource.

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- Q7** State **TWO** benefits and **TWO** limitations of using Information, Communication Technology (ICT) when making a presentation.

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- Q8** State **FOUR** benefits to a horticultural business of a well motivated workforce.

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Please turn over/.....

## ANSWER ALL QUESTIONS

### MARKS

- Q9** State **FOUR** advantages of Total Quality Management (TQM) as a method of ensuring the success of a horticultural enterprise.

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- Q10** List **FOUR** possible sources of financing capital assets other than obtaining a loan from a High Street Bank.

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



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**10:00am Thursday 5<sup>th</sup> July 2007**

**IMPORTANT – Please read carefully before commencing.**

- i) The duration of the papers in Module **F** is **2 hours**.
- ii) Answer **ONE** question from Section **B** and **TWO** questions 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 F**

**Ecology & Environment  
Resource Management**

**Sections B & C**

**Structured Questions**

**Please turn over/.....**

## Section B – Ecology & Environment

**Answer ONE question only from this section**

	<b>MARKS</b>
<b>Q1</b> a) Define secondary succession in plant communities.	<b>2</b>
b) Describe the succession of an abandoned allotment site, relating the process to competition between plant species.	<b>8</b>
c) <b>NAME FOUR</b> different horticultural practices that are used to slow down the process of succession and explain how <b>ONE</b> of these works.	<b>6</b>
d) Define 'plagioclimax' (sub climax) and describe <b>ONE</b> situation where environmental stress or historical human activity, have resulted in one being formed.	<b>4</b>
 <b>Q2</b> a) Describe the climatic and soil conditions associated with the alpine environment.	 <b>8</b>
b) Describe how plants are modified to survive in the natural habitat selected in a).	<b>6</b>
c) Evaluate the methods by which environmental conditions can be manipulated to improve growth and development of these plants.	<b>6</b>

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**Please see over/.....**

## Section C – Resource Management

**Answer TWO questions from this section**

		MARKS
<b>Q3</b>	a) Describe the key elements of a staff development strategy.	<b>10</b>
	b) Explain the merits and limitations of on-the-job training.	<b>6</b>
	c) State the consequences of <b>NOT</b> evaluating training.	<b>4</b>
<b>Q4</b>	Describe the practical implications of <b>TWO NAMED</b> regulations <b>OR</b> areas of legislation related to <b>EACH</b> of the following:	
	i) protection of the environment;	<b>10</b>
	ii) plant health.	<b>10</b>
<b>Q5</b>	a) Explain how the structure of an organisation can influence effective internal communication.	<b>6</b>
	b) Outline <b>TWO</b> methods that a manager might use to improve the efficiency of communication within the workplace.	<b>6</b>
	c) Evaluate alternative methods of external communication for an organisation.	<b>8</b>
<b>Q6</b>	a) Describe the successive stages in the decision making process when purchasing horticultural machinery.	<b>8</b>
	b) Describe <b>TWO</b> methods of calculating depreciation for horticultural machinery.	<b>6</b>
	c) Explain how the purchase of machinery is represented in the financial accounts of a business.	<b>6</b>

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## RHS LEVEL 3 DIPLOMA IN HORTICULTURE WRITTEN EXAMINATION

Thursday 5<sup>th</sup> July 2007

### MODULE F

#### Ecology & Environment Resource Management

#### Examiners Report

Candidates Registered	53				
		<b>Total Candidates Passed</b>			
Candidates Entered	49	92.45%	Passed with Commendation	17	34.69%
Candidates Absent	2	3.77%	Passed	26	53.06%
Candidates Deferred	0	0	Failed	6	12.24%
Candidates Withdrawn	2	3.77%			

### Section A – Short Answer Questions

#### General Comments

Some candidates are still not identifying the specific points asked for in some of the questions. If FOUR points are requested, these need to be clearly marked in order to avoid the examiner having to guess the candidate's intention.

- Q1** State **TWO** factors to consider when replacing an existing beech hedge, assuming hotter, drier summers become more frequent within the UK.

This was a topical question seeking the candidates' up-to-date knowledge of how to react to an aspect of global warming. Possible answers were wide ranging from rather basic ideas of replacing with non-living features through considerations of cost and planning, to more cultural suggestions of increasing organic matter content of the soil, irrigation and mulching. Replacement with more drought tolerant species (names) was also a relevant answer. Well answered by most candidates.

- Q2** Define a halophyte and describe **TWO** of its major characteristics.



Most candidates recognised this as a salt tolerant plant and gave a satisfactory definition. Characteristics include salt avoiding, salt accumulating and salt excreting systems. Saline environments are commonly very exposed both to wind and to strong sunlight and successful plants have to display characteristics to deal with these conditions also. Taproots, low stature, glaucous leaves are examples.

**Q3** State how plant communities can respond to environmental stresses.

Given time, plants can be found to grow successfully in the most inhospitable environments on earth. Therefore, plant communities simply change and adapt to meet the new conditions. Some species can adapt by (over time) changing dormancy periods or developing more substantial root storage organs. Others ensure survival of the species by more copious seed production and extended viability. Stress could be caused by too much or too little water, higher or lower temperature, chemical contaminants etc. and as species die out, others move in to occupy the empty spaces. Many candidates misread the question as how PLANTS respond to stress and lost marks accordingly.

**Q4** Distinguish between allogenic and autogenic succession.

Allogenic succession arises because of external factors such as the environment, mankind's intervention, fire, pests etc. Autogenic succession is brought about by biotic factors, natural genetic evolution or by the plant itself for example by root exudation or leaf litter. Including a specific example of each type earned highest marks.

**Q5** Describe **ONE** method of pricing **EITHER** a horticultural product, **OR** a horticultural service.

The answer to this is not as straightforward as many consumers imagine. Possible answers include comparison pricing, loss leaders, skimming, costing, standard figures. A clear description was needed; many answers were too brief to gain full marks.

**Q6** Define the terms 'Hazard' and 'Risk' and relate **EACH** to an area of horticulture resource.

A hazard is a thing or action that could potentially cause harm or damage whereas a risk is the likelihood and type of injury or damage that could result. Few candidates gave satisfactory definitions but most went on to great lengths and great detail in describing examples.

**Q7** State **TWO** benefits and **TWO** limitations of using Information, Communication Technology (ICT) when making a presentation.

Well answered by most candidates, many of whom had had bad experiences of such presentation. They are a tool and not a substitute for human communication and whereas colour, sound, ability to update and integration of slide/video clip are positive factors, the need for power, the expensive equipment and the training requirements are also needed together with reliable equipment and/or technical help.

**Q8** State **FOUR** benefits to a horticultural business of a well motivated workforce.

The creation of a well-motivated workforce must be a key objective of management, Benefits were well documented in terms of a happier, more productive and positive labour force, more loyal and interested in the success of the business. Factors relating to better customer service were recognised along with ensuring good reputation. Some benefits are very closely linked and distinct examples produce better answers.

- Q9** State **FOUR** advantages of Total Quality Management (TQM) as a method of ensuring the success of a horticultural enterprise.

This creates an environment of a common goal involving all staff and is thus beneficial to motivation, team building and barrier breakdown. Aspects of reliability and uniformity are created with less (expensive) wastage. Increased customer satisfaction and reputation all improve. TQM is an all-embracing approach to quality whereas ISO9000 systems look at management systems and procedures which may not be so effective in delivering quality products and services.

- Q10** List **FOUR** possible sources of financing capital assets other than obtaining a loan from a High Street Bank.

Candidates generally did well in identifying profits, private finance, family/friends, leasing, hire purchase, and grants. Ideas such as mortgaging, Building Societies, credit cards and overdrafts were unsuitable answers.

## Section B – Ecology & Environment

- Q1** a) Define secondary succession in plant communities.  
The examiner was looking for a clear definition of secondary succession: A change in vegetation over time which occurs on existing soil, already influenced by living organisms, but which has been largely laid bare by cultivation or fire, etc.

Many candidates did not appreciate that secondary succession begins following the destruction of vegetation previously present. In addition many used the word 'succession' in their answer, which is what they were supposed to be defining.

- b) Describe the succession of an abandoned allotment site, relating the process to competition between plant species.  
A clear indication of the serial stages was required, from annual weeds, through to herbaceous perennials, then scrub and finally woodland tree cover. Examples of a plant found in each stage were expected, correctly named. Change through competition should have been explained, giving examples of environmental resources competed for. An indication of the characteristics of colonisers (opportunistic species) and competitors should have been given.

Many candidates correctly went through the various stages of secondary succession but some failed to give correctly named examples. Some missed out 'scrub' as a stage. Some lengthy answers were given but unfortunately little mention was given to the process of change through competition, particularly for light and soil resources. Very few mentioned any specific characteristics of colonisers and competitors. Detailed accounts of the structure of the final climax woodland ecosystem were not required.

- c) **NAME FOUR** different horticultural practices that are used to slow down the process of succession and explain how **ONE** of these works.

Four HORTICULTURAL practices were required, such as mowing, weeding, using herbicide, mulching, etc. , followed by an explanation of how ONE of these processes actually slows down the process of succession. In other words what is the practice doing to prevent succession from continuing?

Many candidates cited non-horticultural practices such as grazing, ploughing and burning. These are large-scale agricultural or conservational practices. Few gave sufficient information on their chosen example to gain full marks. Some mentioned weed killers but talked at length about the process of weed destruction rather than why using them stops succession.

- d) Define 'plagioclimax' (sub climax) and describe **ONE** situation where environmental stress or historical human activity, have resulted in one being formed.

A clear definition of a plagioclimax - a seral stage held maintained at that point through an activity or condition which prevents further change. ONE correctly identified cause was required, such as fire (burning), wind effect, grazing, etc.. A brief explanation was then required of a situation where a plagioclimax has been formed and maintained through a particular stress or activity.

Most were able to adequately define a plagioclimax and give a cause. Some gave a good explanation of the cause. A few gave specific details of a particular environmental project that they had read about but failed to meet the demands of the question by not linking it to plagioclimax.

- Q2** a) Describe the climatic and soil conditions associated with the alpine environment

A clear description of any four soil or climatic conditions associated with this environment were required, such as snow cover in winter, which protects the plants from the worst of the winter weather; high wind speeds which stunts growth and reduces moisture availability; very changeable weather conditions with diurnal extremes of temperatures; well-drained gravel/stony soils offering limited water; low nutrient content due to rain leaching out minerals through thin soils, etc.

Many candidates did well on this section gaining full marks. Some however became deflected and gave long geographical descriptions of places they had visited, or talked at length about soil formation which was not required.

- b) Describe how plants are modified to survive in the natural habitat selected in a).

Clear descriptions of ALPINE plant modifications for survival in these conditions (as described in (a) above) were required. Adaptations to: reduce water loss, such as sunken stomata or hairy leaves; to avoid wind damage such as cushion-type growth; to avoid excess solar UV radiation such as silver-colour reflective leaves; to make use of the short growing season such as rapid flower development and seed setting; to store water such as succulent-type leaves.

Again, many did well in this section. Some, however, did not adhere to the question and did not give sufficient information on the points they mentioned. Some veered off to talk incorrectly about adaptations of coniferous trees and insectivorous bog plants.

- c) Evaluate the methods by which environmental conditions can be manipulated to improve growth and development of these plants.

This question concerned the growth of these plants in a horticultural situation and required information regarding the mimicking of alpine conditions in order for healthy growth and development. Such conditions could have included, the use of alpine houses designed specifically to allow high light levels; the use of well-drained compost to prevent build up of soil moisture and subsequent root rot; ensuring adequate ventilation to prevent an excessive built-up of moisture.

Some candidates answered this well. However, many got deflected. A full description of the alpine house at Wisley was not required, neither were the intricacies of germinating seeds of alpine or setting up of an alpine trough. Some mistakenly mentioned adding more fertiliser/nutrients and/or improving soil conditions to stimulate growth, rather than mimicking natural alpine growing conditions.

### **Overall Comments**

It is clear that some candidates are still not carefully reading each question in order to fully understand its requirements. In addition some do not take account of the mark allocation and write far too much for a section with 2 or 4 marks.

The writing out of a question is still occurring on scripts. This just wastes time, just as writing an introductory couple of sentences saying that, for example 'that alpine plants are modified to cope with the extreme of alpine conditions' without actually saying what one is.

## **Section C – Resource Management**

### **General Comments**

Candidates had generally prepared well for this paper and there were few instances of poor examination technique, however legislation in the horticultural industry was a weaker area in respect to candidate answers.. Strong candidates provided well-structured responses and used a range of examples and theory to support comments made. Weaker candidates did not demonstrate sufficient understanding of principles or practice.

- Q3** a) Describe the key elements of a staff development strategy.  
Clear description of all key elements of a well-structured staff development strategy. Weaker responses detailed training requirements for individual staff rather than gave a corporate view or limited the scope of the answer to the benefits of training.
- b) Explain the merits and limitations of on-the-job training.  
Clear explanation of all of the key merits and limitations of on-the-job training. Strong answers tabulated merits and limitations. Candidates lost marks where there were insufficient points made or points lacked clarity.
- c) State the consequences of **NOT** evaluating training.  
The negative consequences of not evaluating training for the individual and business and the positive contribution to improving staff and future training activities if such evaluation is carried out. Strong responses provided practical examples of what could happen if training is not evaluated properly.
- Q4** Describe the practical implications of **TWO NAMED** regulations **OR** areas of legislation related to **EACH** of the following:
- iii) protection of the environment;
  - iv) plant health.
- i) Clear reference to two distinct areas of legislation/code of practice eg. FEPA, COPR Regulations. Detailed description of how a business could comply with the legislation, preferably related to a specific horticultural sector.
- ii) Detailed description of the practical effects of two distinct areas of legislation/code of practice eg. Plant Health Order 2005, seed Varieties Act 1964.
- Many candidates did not supply four distinct areas of legislation /code of practice required, either because they had limited knowledge or misunderstood the question.
- Q5** a) Explain how the structure of an organisation can influence effective internal communication.  
Clear explanation of the positive and negative influences of contrasting organisational structures on communication flows. The nature of formal and informal structures and effects of sites/location on horizontal and vertical information flows and media choice. Strong responses provided organisational charts indicating communication flows and potential barriers.
- b) Outline **TWO** methods that a manager might use to improve the efficiency of communication within the workplace.  
Two distinct methods that could be introduced to improve the efficiency of communication. Clear statement of the methods and intended improvements,. Weaker responses did not establish clearly how and what benefits could accrue from the chosen methods.

- c) Evaluate alternative methods of external communication for an organisation. An evaluation of the benefits and limitations of a broad range of external communication channels and media, to include technological developments eg internet and mobile telecommunications. To refer to the importance of marketing and promotion as key elements of external communication. In a number of cases candidates did not appreciate the difference between internal and external communication channels.

- Q6** a) Describe the successive stages in the decision making process when purchasing horticultural machinery.

Clear and detailed description of the successive stages in the decision making process when purchasing horticultural machinery. Clear reference to need, cost-benefit analysis, obtaining quotations, selecting appropriate financing options and evaluation to improve future decisions.

- b) Describe **TWO** methods of calculating depreciation for horticultural machinery.

Two distinct methods of calculating depreciation, specific worked examples with accurate and realistic depreciation schedules and clear descriptions. Charts and diagrams would have improved clarity.

- c) Explain how the purchase of machinery is represented in the financial accounts of a business.

Accurate explanation of how the purchase of machinery is represented in a trading, profit and loss account, balance sheet and cash flow statement. Clear understanding of the terms capital introduced, capital expenditure, interest/financing charge, fixed assets, depreciation, fixed / overhead costs. Weaker responses confused key financial terms or principles.

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