



Candidate Number: .....

Candidate Name: .....

Centre Number/Name: .....

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

**Thursday 8<sup>th</sup> February 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**

**Environment and Ecology,  
Resource Management.**

**Section A – Short Answer Questions**

Please turn over/.....

## ANSWER ALL QUESTIONS

MARKS

**Q1** Define an ecosystem.

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**Q2** Name **TWO** abiotic factors and state how **EACH** one affects plant growth.

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**Q3** Describe **TWO** plant adaptations used to withstand shaded habitats.

**2**

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**Q4** State what is meant by an 'environmental impact analysis'.

**2**

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Please see over/.....

**ANSWER ALL QUESTIONS**

**MARKS**

**Q5** List **FOUR** essential components of a job description.

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**Q6** State the differences between an estimate and a quotation.

**2**

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**Q7** State **FOUR** examples of external barriers to communication, which may arise during the interview process.

**2**

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**Q8** State **FOUR** different and likely consequences of poor commitment to health and safety at work.

**2**

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

**ANSWER ALL QUESTIONS**

**MARKS**

**Q9** State **FOUR** important factors to consider when deciding upon a location for a new garden centre.

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**Q10** State **FOUR** examples of records used in the management of machinery.

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## **RHS (LEVEL 3) DIPLOMA IN HORTICULTURE WRITTEN EXAMINATION**

**Thursday 8<sup>th</sup> February 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**

**Environment and Ecology,  
Resource Management.**

**Sections B & C**

**Structured Questions**

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

## Section B – Environment and Ecology

Answer **ONE** question only from this section

|  | <b>MARKS</b> |
|--|--------------|
| <b>Q1 a)</b> Explain how <b>NAMED</b> hydrophytes are adapted to survive in their particular environment.  | <b>8</b>     |
| <b>b)</b> Using <b>NAMED</b> plant examples, describe the physical and vegetation changes that would occur if a new ornamental lake, fed by a small stream, is left unmanaged. | <b>12</b>    |
| <br>   |              |
| <b>Q2 a)</b> Describe the potential environmental impact, which may arise from a <b>NAMED</b> horticultural situation.   | <b>10</b>    |
| <b>b)</b> Explain how the environmental impact can be minimized by selection of materials for the situation in a).   | <b>10</b>    |

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Please see over/.....

## Section C – Resource Management

Answer **TWO** questions only from this section

|   | <b>MARKS</b> |
|---|--------------|
| <b>Q3 a)</b> List <b>SIX</b> types of discrimination in the workplace.  | <b>3</b>     |
| <b>b)</b> Describe how recruitment and selection procedures can be devised to avoid discrimination.   | <b>8</b>     |
| <b>c)</b> Explain the benefits of evaluating staff induction and training processes.  | <b>9</b>     |
| <br>  |              |
| <b>Q4 a)</b> Define the term 'quality' by describing the attributes of <b>TWO</b> horticultural products or services.   | <b>8</b>     |
| <b>b)</b> Explain how achieving a <b>NAMED</b> recognised quality mark can contribute to the success of an organisation/business.   | <b>12</b>    |
| <br>  |              |
| <b>Q5 a)</b> Compare and contrast a <b>NAMED</b> sector of amenity horticulture with a <b>NAMED</b> sector of production horticulture in terms of structure and organisation. | <b>12</b>    |
| <b>b)</b> Explain the role of <b>NAMED</b> horticultural trade associations.  | <b>8</b>     |
| <br>  |              |
| <b>Q6 a)</b> List and describe <b>FOUR</b> sources of finance available for starting-up a small horticultural business.   | <b>8</b>     |
| <b>b)</b> Describe the main elements of a cash flow forecast in a business.   | <b>8</b>     |
| <b>c)</b> Explain how a computer spreadsheet may assist in cash flow forecasting.   | <b>4</b>     |

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## RHS (LEVEL 3) DIPLOMA IN HORTICULTURE WRITTEN EXAMINATION

Thursday 8<sup>th</sup> February 2007

### Module F

#### Environment and Ecology, Resource Management.

#### Examiners Report

|                       |    |        |                          |    |        |
|-----------------------|----|--------|--------------------------|----|--------|
| Candidates Registered | 67 |        | Total Candidates Passed  |    |        |
| Candidates Entered    | 57 | 85.07% | Passed with Commendation | 14 | 24.56% |
| Candidates Absent     | 2  | 2.98%  | Passed                   | 34 | 59.65% |
| Candidates Deferred   | 7  | 10.45% | Failed                   | 9  | 15.79% |
| Candidates Withdrawn  | 1  | 1.49%  |                          |    |        |

#### Section A – Short Answer Questions

**Q1** Define an ecosystem.

Generally well answered but marks were lost in some cases because of vagueness or lack of clarity. An ecosystem is a natural system and one that is stable, certainly in the short and medium term. Comprising of ALL biotic and abiotic factors interacting in a specific location, an ecosystem can be as small as a puddle or as large as an ocean. Such factors do need brief explanations / examples and the terms flora and fauna in connection with biotic factors, are not adequate to gain full marks.

**Q2** Name **TWO** abiotic factors and state how **EACH** one affects plant growth.

Abiotic factors were well identified as non-plant factors. Thus the choice was wide and included air, water, light, rocks, soil, climate, wind, temperature and humidity. Some marks were lost through not identifying the significant effects on plant GROWTH which results from each of the chosen four factors although it is important to be concise in this short answer question.

**Q3** Describe **TWO** plant adaptations used to withstand shaded habitats.

A well answered question, there were many acceptable adaptations including early spring growth under tree, summer dormant bulbs, long internodes e.g. climbers, large and dark green leaves (increased chloroplasts) and evergreens. All these are where light is recognised as an essential factor for plant growth and development. Some marks were lost because of incorrect choice of adaptation or inadequate descriptions.



**Q4** State what is meant by an 'environmental impact analysis'.

Although this term was correctly understood by most candidates, details of what is entailed were frequently missed. It is important to recognise that it is a thorough and wide-ranging analysis of the likely effects of a proposed scheme and should take notice of all biotic factors as well as effects in the environment which may be caused by, for example, resulting changes in water courses or water tables.

**Q5** List **FOUR** essential components of a job description.

Job Descriptions vary according to the specific job but all centre on describing as clearly as possible the specific job itself. Therefore factors such as the purpose of the job, responsibilities (for processes or resources like people or money), authority, reporting details are important along with details of principal tasks and performance indicators. Hours of work and overtime requirements are also factors which help describe the essential nature of the job. It is all about what is actually done by the job holder. Factors such as qualifications, pay/salary, holidays are important but covered in other documentation such as job advertisements, person specifications and contracts (and written particulars) of employment.

**Q6** State the differences between an estimate and a quotation.

This was well understood by most candidates although a few confused the two terms. The initials E&OE standing for 'errors and omissions excepted' continue to be missed by a significant number of candidates but this does not provide a supplier with total freedom to alter the quoted price – the mistake must be very obvious or provable if necessary, in order to have any validity. Both estimates and quotations may be verbal or in writing although in practice quotations are almost inevitably given in writing as this result in less opportunity for confusion.

**Q7** State **FOUR** examples of external barriers to communication, which may arise during the interview process.

This question asked for examples of external barriers, that is barriers which might exist outside the bodies of either the interviewer or interviewee. Thus they are distractions picked up by the sense of sight, hearing or smell. Specific examples of these should be mentioned. Other barriers include physical interruptions by other staff and layouts of interview rooms or furniture. External barriers are not about discrimination or attitude problems and examples of these were often incorrectly given by candidates. Other mistakes included factors relating to events which might take place before rather than during the interview itself.

**Q8** State **FOUR** different and likely consequences of poor commitment to health and safety at work.

Some candidates failed to clearly identify FOUR different consequences. Good answers identified the likelihood of more accidents, time off work for injured employees, legal costs and accident time investigations, cost of temporary labour, damage to machinery and / or stock, increased insurance premiums, affect on moral. It is the recognition of such factors as these, which will reinforce safe practice for the benefit of all parties involved.

**Q9** State **FOUR** important factors to consider when deciding upon a location for a new garden centre.

A straightforward question well answered but some candidates failed to identify four factors. Because of large site requirements, garden centres tend to be outside urban centres and most customers will arrive by car. Factors are local population size and popularity of gardening, adequate site size, cost and local planning attitudes, competition (not always a negative fact), access, road visibility and environmental factors such as no flood risk and reasonably sheltered site. The availability of local labour is not usually a problem as few are employed and some candidates still incorrectly believe that garden centres grow a significant amount of stock themselves.

**Q10** State **FOUR** examples of records used in the management of machinery.

A good response was received from most candidates. Good examples of machinery records include hours of use, service records, maintenance, instruction manuals, guarantees, spares suppliers and details, risk assessments. Some mention of training records but these are more correctly seen as personnel records.

## Structured Questions

### Section B – Environment and Ecology

**Q1 a)** Explain how **NAMED** hydrophytes are adapted to survive in their particular environment.

This question proved more popular than q. 2

The examiner was looking for four adaptations specific to hydrophytes and an appropriate NAMED example in each case.

Many candidates correctly identified appropriate examples of water-dwelling plants but failed to give full genus and species names. Common names are not adequate. 'Seaweeds' are not hydrophytes.

Many obvious adaptations were identified, such as:

- the lack of supporting tissue (sclerenchyma) as the water supports the plants, although a few candidates mentioned a reduction in 'parenchyma' tissue instead of sclerenchyma.
- stomata on the upper surface of floating-leaved plants to ensure adequate gas exchange, although a few stated that this improves photosynthesis, without making the link between gas exchange and the need for carbon dioxide for photosynthesis.
- the presence of air chambers between the cells (aerenchyma tissue) to facilitate aeration of the internal tissues. Some cited the function simply as an aid to buoyancy, which is not its primary function. Others mistakenly said there were air chambers in the 'cells' and called them 'aerenchyma cells'.
- finely divided leaves in some submerged plants providing a large than normal surface area to aid absorption of oxygen and minerals from the water. Again some mistakenly said this was an aid to increasing photosynthesis as light

levels were lower underwater, however finely divided leaves like this have fewer chloroplasts in them. Some also cited an advantage that finely-divided leaves reduced 'drag' in flowing water, although this is not the primary reason for their morphology.

- roots adapted to anchor the plant in the substrate rather than absorption of nutrients and water (as this is achieved over the entire plant surface).

Some candidates quoted examples which did not differ from 'normal' mesophytic plants, such as chlorophyll (chloroplasts) concentrated in the upper surface of leaves; photosynthesis over the entire surface of leaves and stems and the presence of lenticels in stems of some plants with aerial parts.

Some candidates wasted time by writing out the question and giving a several-sentence introduction stating that 'hydrophytes are adapted to their surroundings otherwise they would not survive' which attracted no marks! A few also wrote in note form or listed 'one-word' adaptations which is NOT an explanation!

- b) Using **NAMED** plant examples, describe the physical and vegetation changes that would occur if a new ornamental lake, fed by a small stream, is left unmanaged.

Here the emphasis is on outlining the successional changes that are likely to take place if an ORNAMENTAL lake was left unmanaged.

The examiner was looking for a good understanding of the basic processes causing succession in this lake - allogenic succession - changes in species brought about by physical changes, such as the accumulation of material (silt) brought in by the stream, plus - autogenic succession - changes in species brought about by the plants themselves, death and decay causing a build-up of organic material in the lake.

Then the various stages should be identified and described with an appropriate plant example cited for each (genus and species name). Most of the lake is originally open-water with sparse aquatic plant growth. Silting of the lake leads to increasing marginal and aquatic plant growth leading to entrapment of suspended material and a further build-up of organic matter. On-going build-up of material results in little open water and a domination by marginal plants. Damp-tolerant woody species begin to move in followed eventually by climax tree vegetation such as oak woodland (*Quercus robur*).

The lake is an ornamental lake, not a lake in the 'wild' which has had several centuries of change so has had time to build up layers of peat and may, eventually (in some cases), form a sphagnum peat bog. Candidates who diverted their account to this type of succession did not gain many marks.

As above, those candidates who made a short list of changes or wrote in note-form did not effectively 'describe' the changes and, as a consequence, did not gain as many marks. Some chose a diagrammatic explanation. Those who produced clear, neat, well-annotated diagrams gained more marks than those whose diagrams were scruffy, rushed and poorly labelled. Ink-drawn diagrams tended to be poorly-presented. Use of colour was not necessary. Mention of

'eutrophication' was irrelevant. Writing about processes of 'management' to prevent succession was also irrelevant. Both did not relate to the question, underlying the importance of reading the question carefully before attempting an answer.

- Q2 a)** Describe the potential environmental impact, which may arise from a **NAMED** horticultural situation.

The examiner was looking for a specific NAMED horticultural situation, such as raising of nursery stock. Five potentially environmentally damaging practices or use of materials should then be identified, related to the chosen situation, together with an outline of the environmental consequence. Two possible examples could be: (i) the use of peat-based composts, with an explanation as to how this leads to direct destruction of peat bogs and a reduction in plants and animals of this habitat, plus indirect damage such as affecting the surrounding water table. (ii) the use of pesticides, with an explanation as to what happens when they find their way into neighbouring water bodies (destruction of wildlife) plus the fact that they may destroy useful insects as well as harmful pests.

Candidates who chose a specific situation and then proceeded to identify five practices or use of materials, followed by a clear explanation as to how and why these were damaging to the environment did well. Remarks concerning social and economic problems were not relevant to the question. Candidates who wrote a 'risk assessment' with a detailed account of preventative measures failed to correctly address the question. Those who chose **one** practice, such as use of pesticides, and used it as a 'horticultural situation' had difficulty in identifying sufficient damaging practices and consequences, thus did not gain full marks. In addition there were many vague, inadequate comments about causing 'problems' or (unidentified) 'damage'.

- b)** Explain how the environmental impact can be minimized by selection of materials for the situation in a).

The examiner was looking for realistic alternatives to the potentially damaging practices/material-use given in part (a). For each a clear explanation of the positive affects of the alternative (i.e. how/why is it a better alternative) was required, together with any potential negative affects.

Candidates who were able to successfully complete part (a) of the question usually went on to provide suitable alternatives and explanations. However, there were some who were able to provide an alternative but were a bit vague as to why/how this was a better! Those who approached the whole question from a 'risk assessment' basis had great difficulty gaining any marks from this section.

## Section C – Resource Management

- Q3 a)** List **SIX** types of discrimination in the workplace.

Candidates had generally prepared well for this paper and there were a few instances of poor examination technique, however financial accounts and the general structure of the horticultural industry were weaker syllabus areas. 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 practise.

This three part question was on recruitment and staff training. The first part required a listing of the types of discrimination in the workplace. Good responses provided a broad range of types and demonstrated an up to date understanding of legislation.

- b)** Describe how recruitment and selection procedures can be devised to avoid discrimination.

The second part of the question required a description on how recruitment and selection procedures could be devised to avoid discrimination. Good answers provided a clear and concise description of the procedures and specific actions to avoid discrimination, weaker answers provided points on discrimination that were too general and did not answer the question fully.

- c)** Explain the benefits of evaluating staff induction and training processes.

The final part required an explanation of the benefits of evaluating staff induction and training processes. This was the weakest part of many answers, with often too few points provided on evaluation and in many cases a general explanation of the processes instead of on evaluation of the benefits.

- Q4 a)** Define the term 'quality' by describing the attributes of **TWO** horticultural products or services.

This question on quality was in two parts and was generally well answered by candidates. Weaker candidates did not look carefully enough at the marks allocation and spent insufficient time on the second part. The first part required a definition of the term 'quality'. Strong candidates clearly defined concepts of good or poor quality and demonstrated knowledge of theory related to customer needs and pricing.

- b)** Explain how achieving a **NAMED** recognised quality mark can contribute to the success of an organisation/business.

The second part required an explanation of the role of quality marks in successful organisation. Good answers provided a detailed account of quality systems, processes and monitoring, and identified benefits for stakeholders. Weaker responses provided a narrow range of benefits of accreditation.

- Q5 a)** Compare and contrast a **NAMED** sector of amenity horticulture with a **NAMED** sector of production horticulture in terms of structure and organisation.

This two part question was on the horticultural industry. The first part required a comparison of two sectors of horticulture. Many candidates were unable to demonstrate a clear understanding of two contrasting sectors and instead limited their description to the structure of individual businesses, other answers were poorly structured.

- b)** Explain the role of **NAMED** horticultural trade associations.

The second part required an explanation of the role of named horticultural trade associations. Strong answers provided at least two different organisations and clearly explained their role in supporting business.

- Q6 a)** List and describe **FOUR** sources of finance available for starting-up a small horticultural business.

This three part question on finance required an understanding of some key financial principles. The first part required a description of four sources of finance available for starting-up a business. Good answers provided clear and distinct examples with a full description of the range of features of finance and uses of funds.

- b)** Describe the main elements of a cash flow forecast in a business.

The second part required a description of the main elements of a cash flow forecast. Strong responses provided a listing of the key components and a worked example to support points made. Weaker responses confused the cash flow measure with profit or provided a general account of the benefits of a cash flow rather than describe the individual components that make up the forecast.

- c)** Explain how a computer spreadsheet may assist in cash flow forecasting.

The final part required an explanation of the use of a computer spreadsheet in the cash flow forecasting. Weak answers provided a general account of IT benefits, strong answers provided a clear explanation of the broad range features of a computer spreadsheet that could assist in cash flow.