



RHS LEVEL 3 DIPLOMA IN HORTICULTURE WRITTEN EXAMINATION

10:00am Thursday 12th February 2009

Module F

Horticultural Environment & Ecology Resource Management in the Horticultural Enterprise

Section A – Short Answer Questions

Candidate Number:.....

Candidate Name:.....

Centre Number/Name:.....

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.

Please turn over/.....

ANSWER ALL QUESTIONS

IMARKS

- Q1** State **FOUR** external barriers to communication which may arise during the interview process.

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- Q2** List **FOUR** elements of a staff induction programme.

2

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- Q3** State the difference between an estimate and a quotation.

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- Q4** State **FOUR** effects of increasing carbon dioxide concentration in the atmosphere.

2

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Please see over/.....

ANSWER ALL QUESTIONS

MARKS

Q5 State the role of a National Plant Collection holder.

2

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Q6 Distinguish between allogenic and autogenic succession.

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Q7 Define the term 'plant passport' and state when it may be required.

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Q8 List **FOUR** alternative sources of finance for capital assets other than obtaining a loan from a high street bank.

2

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Please turn over/.....

ANSWER ALL QUESTIONS

MARKS

- Q9** Define the terms 'hazard' and 'risk' and relate **EACH** to a horticultural activity. **2**

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- Q10** Explain the importance of cash flow management in a small business. **2**

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



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10.00am Thursday 12th February 2009

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

**Horticultural Environment & Ecology
Resource Management in the Horticultural Enterprise**

Sections B & C – Structured Questions

Please turn over/.....

Section B – Horticultural Environment & Ecology

Answer **ONE** question only from this section

		MARKS
Q1	a) Distinguish between a halophyte and a hydrophyte.	2
	b) Describe how NAMED hydrophytes are adapted to specific environments.	12
	c) Describe how a range of environmental conditions in the garden can be broadened to allow for the growing of a range of hydrophytes.	6
Q2	a) Describe the potential environmental impact, which may arise from a NAMED horticultural situation.	10
	b) Explain how the environmental impact can be minimized by selection of materials for the situation NAMED in a).	10

Please see over/.....

Section C – Resource Management in the Horticultural Enterprise

Answer TWO questions only from this section

		MARKS
Q3	a) Describe the requirements of TWO current NAMED regulations that were introduced to improve safety at work.	12
	b) Evaluate food safety legislation and relate it to an area of horticulture.	8
Q4	a) List the main requirements of employment legislation on the selection and recruitment of staff.	8
	b) Describe TWO contrasting selection methods used to distinguish between candidates.	6
	c) Explain why it is important to have a structured induction process for new recruits.	6
Q5	a) Describe the successive stages in the decision making process when purchasing horticultural machinery.	8
	b) Describe TWO methods of calculating depreciation for horticultural machinery.	6
	c) Explain how the purchase of machinery is represented in the financial accounts of a business.	6
Q6	a) Describe TWO effective stock control systems that may be used to manage resources in a NAMED horticultural business.	12
	b) Evaluate the use of ICT (information and communication technology) for stock control in a small horticultural business.	8

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Thursday 12th February 2009

Module F

Horticultural Environment & Ecology Resource Management in the Horticultural Enterprise

Candidates Registered	75		Total Candidates Passed	56	86.15%
Candidates Entered	65	86.66%	Passed with Commendation	23	35.38%
Candidates Absent	8	10.67%	Passed	33	50.77%
Candidates Deferred	2	2.67%	Failed	9	13.85%
Candidates Withdrawn	-				

Section A – Short Answer Questions

- Q1** State **FOUR** external barriers to communication which may arise during the interview process.

The key word here was “external”. Thus internal factors such as attitude to disabilities and language were not eligible. Good examples of external barriers would include noise, interruptions, visual distractions either in the room or outside the window, strong smells and acute environmental factors such as strong lighting, uncomfortable seating or temperature. External barriers are all about factors likely to cause a distraction to the interview process.

- Q2** List **FOUR** elements of a staff induction programme.

The aim was to identify four clearly different elements. Thus, information on health and safety would normally **INCLUDE** details of fire prevention and procedure, and Personal Protective Equipment and risk assessment. Better answers covered a wide range including introductions to work colleagues and other key staff, the work place itself and pay and personnel matters

- Q3** State the difference between an estimate and a quotation.

The phrase “legally binding” is a useful one to describe quotations and Errors and Omissions Excepted is a key phrase to safeguard genuine secretarial errors and avoid spurious litigation. Although commonly done, quotations do not have to be detailed or in writing but common sense implies that this should be done. Quotations should be studied carefully as they may contain clauses allowing price variation of minor elements.

Q4 State **FOUR** effects of increasing carbon dioxide concentration in the atmosphere.

This question related to the global atmosphere and not the atmosphere inside glasshouses or cold stores. Key points should included increases in mean temperatures, the photosynthetic process and sea levels due to accelerated melting of polar ice caps. Also increases in nutrient absorption and acid rain due to the formation of carbonic acid. Changes in plant distribution and pest and disease incident are also likely predictable effects.

Q5 State the role of a National Plant Collection holder.

Knowledge of the functions and activity of horticultural organisations such as the N.C.C.P.G. is expected of candidates at this level and the work of National Collection holders is vital. The role includes collecting, growing (conserving), recording, propagating and research into as many variations of the named collection as possible. Collections need to be accessible to the public and material made available for research and domestic sale if appropriate. Some candidates lost marks by limiting collections to “species”, natural, endangered selections and missing key functions.

Q6 Distinguish between allogenic and autogenic succession.

Well answered. Key terms included were biotic and abiotic factors with clear examples of each. The emphasis should be on the changing plant communities.

Q7 Define the term ‘plant passport’ and state when it may be required.

Correctly understood by most candidates as an E.E.C. system designed to control the spread of specific and particularly damaging pests and diseases. Incorrect answers referred to “pest and disease free”. Passports are issued by growers on behalf of D.E.F.R.A. (in U.K.) and are required when material moves between growers, wholesalers and retailers. It aims to enable traceability if necessary.

Q8 List **FOUR** alternative sources of finance for capital assets other than obtaining a loan from a high street bank.

Unsuitable sources for capital assets included overdrafts, credit cards and re-mortgaging all of which carry inappropriate risks. Common suggestions included family, friends, partners, shareholders and hire purchase and leasing arrangements. Grants tend to be too specific to include here unless full details are given.

Q9 Define the terms ‘hazard’ and ‘risk’ and relate **EACH** to a horticultural activity.

Well understood by most candidates who gave separate examples of each. Often missing from ‘risk’ was the specific harm which may arise should an accident happen i.e. risk of death, of cuts, of poisoning etc. Note also that several risks may arise from the same hazard.

Q10 Explain the importance of cash flow management in a small business.

Good answers included the importance of separating cash flow from profit. Weakness was shown by failing to acknowledge situations of “excess” income and the need for prudent short-term investment. Many candidates identified suppliers and need for asset purchases, few named wages/salaries as the most important call on finance. Correct use of terms such as liquidity, working capital and seasonality of business implied good understanding of this subject.

Sections B & C – Structured Questions

Section B – Horticultural Environment & Ecology

- Q1**
- a) Distinguish between a halophyte and a hydrophyte.
 - b) Describe how **NAMED** hydrophytes are adapted to specific environments.
 - c) Describe how a range of environmental conditions in the garden can be broadened to allow for the growing of a range of hydrophytes.

Aims of the Question

- a) A clear definition of the differences between these two plant types was required: Halophyte - adapted to live in soil/sediment containing high concentrations of salt; Hydrophyte - adapted to live in waterlogged soil or partly/wholly submerged in water.
- b) The examiner was looking for 6 NAMED hydrophytes, and in each case an adaptation specific to the environment in which it lives. Adaptations, such as:
 - the lack of supporting tissue (sclerenchyma) as the water supports the plants.
 - stomata on the upper surface of floating-leaved plants to ensure adequate gas exchange.
 - the presence of air chambers between the cells (aerenchyma tissue) to facilitate aeration of the internal tissues.
 - finely divided leaves in some submerged plants providing a larger than normal surface area to aid absorption of oxygen and minerals from the water.
 - 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).
 - the presence of pneumatophores (breathing roots) in species inhabiting mangrove swamps (e.g. *Avicennia germinans*)
- c) Providing a water feature (a pond) and a bog garden were the two essential features required. A brief account of how each condition could be created was needed. Allowance was also given for the provision of a named plant in each case.

Observations on Answers

- a) Most candidates were aware of the key differences.
- b) Many candidates correctly identified appropriate examples of water-dwelling plants but failed to give full genus and species names. Common names are not adequate. 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. An account of respiration and photosynthesis was not required.

- c) Most candidates mentioned a pond and a bog garden as environments to be included, but some did not give further information as to how these would be created. Although some mentioned the need to have varying depths in the pond few actually stated what the appropriate depths for deep-water plants and marginal (shallow-ledge) plants should be.

Recommendations

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.

- Q2** a) Describe the potential environmental impact, which may arise from a **NAMED** horticultural situation.
- b) Explain how the environmental impact can be minimized by selection of materials for the situation **NAMED** in a).

Aims of the Question

- a) A **NAMED** situation was required, such as a nursery where seedlings are raised for potting on into suitable containers for sale to the public. Each of a max of five environmental impacts should be identified and a description given for each outlining how the environment is affected. Such impacts as: use of plastic (non-degrading) containers creating a disposal problem, many finishing up in landfill; use of unsustainable peat in composts which erodes peat-bog ecosystems and reducing biodiversity associated with this material; providing artificial heating and lighting which uses energy, much of which comes from the burning of fossil fuels and thus increasing the carbon footprint and contributing to global warming.
- b) For each point mentioned in part a), an explanation as to how the selection of materials can minimise environmental impacts was required. For example; using bridgeable containers or those which can be recycled to reduce landfill. Using peat alternatives in compost to prevent peat-bog degradation and thus conserve that ecosystem and associated biodiversity; reducing the use of fossil-fuel energy by improving insulation, installing a wind turbine, using solar power cells, etc.

Observations on Answers

- a) Many candidates knew a great deal about environmental impacts associated with horticultural practices. However, a few went off on a tangent and described the conduction of an 'Environmental Impact Assessment' and the planning procedures required when initiating a new project, both of which were not required.
- b) There were some good answers, relating impacts to minimization. However,

some candidates did not relate what had been recorded in part a) to the answer in part b).

Recommendations.

1. Candidates should make clear the sections of their answers by using the a), b), structured breakdown as requested in the question.
2. Some candidates are still writing out the question, therefore so wasting valuable time.

Section C – Resource Management in the Horticultural Enterprise

- Q3** a) Describe the requirements of **TWO** current **NAMED** regulations that were introduced to improve safety at work.
- b) Evaluate food safety legislation and relate it to an area of horticulture.

Candidates who gained high marks in this question were able to describe the requirements of TWO current NAMED REGULATIONS rather than Acts of Parliament.

Answers that were factual and that described the requirements of the regulations scored the highest marks.

The second part of the question challenged many candidates and resulted in many answers that were either, vague or opinionated rather than factual and accurate. At Level 3 examiners are looking for factual answers that show an in depth understanding of the topic.

- Q4** a) List the main requirements of employment legislation on the selection and recruitment of staff.
- b) Describe **TWO** contrasting selection methods used to distinguish between candidates.
- c) Explain why it is important to have a structured induction process for new recruits.

Candidates who gained high marks in this question were able to show a detailed factual understanding of the topic.

Part b) of the question asked for contrasting methods of selection, and the examiners were expecting answers that met this criteria, such as interview and psychometric testing. Candidates who chose very similar methods such as formal and informal interviewing showed a poor understanding of the subject and scored lower marks.

Part c) of the question asked why structured inductions were important rather than why inductions were important in general. Candidates who discussed the importance of inductions being structured scored high marks, candidates who merely stated the importance of inductions scored lower marks.

- Q5** a) Describe the successive stages in the decision making process when purchasing horticultural machinery.
- b) Describe **TWO** methods of calculating depreciation for horticultural machinery.
- c) Explain how the purchase of machinery is represented in the financial accounts of a business.

The first part of this question was in general answered very well by candidates who showed an understanding of the way decision making models apply to a horticultural situation. Candidates who discussed cost benefit analysis demonstrated an in depth knowledge of the subject.

The second part of the question asked for TWO methods of calculating depreciation to be described. Most candidates were able to describe straight line depreciation, however some struggled to describe a second system. Many candidates misunderstood the basic principles of why items are depreciated in business accounts.

Candidates who had researched and gained a detailed understanding of business accounts in preparation for this examination gained high marks in the part of the question. However many candidates failed to show a basic understanding of the way that the purchase of machinery can be represented in business accounts.

- Q6** a) Describe **TWO** effective stock control systems that may be used to manage resources in a **NAMED** horticultural business.
- b) Evaluate the use of ICT (information and communication technology) for stock control in a small horticultural business.

Candidates who had researched stock control methods and were able to describe in detail the advantages and disadvantages of the two different systems gained high marks in this question.

The second part of the question was well answered, and took into account the needs of a small horticultural business and the available technology for the horticultural industry.

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