



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

**2.00pm Wednesday 11th February 2009**

**MODULE J**

**Establishment & Maintenance of Decorative Ornamental Turf  
Plant Selection, Establishment & Maintenance  
Hardy Ornamental Nursery Stock**

**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 J 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

### MARKS

- Q1** Give **TWO** suitable examples of bulbs **OR** corms for autumn display in an ornamental border.

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- Q2** List **FOUR** physical factors to be considered when selecting a site for a new area of fine turf.

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- Q3** Describe the difference between *Agrostis tenuis* and *Festuca rubra* var. *rubra*.

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- Q4** List **FOUR** potential hazards when pruning roses.

2

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Please see over/.....

## ANSWER ALL QUESTIONS

MARKS

- Q5** Describe the seasonal pruning of a **NAMED** evergreen subject, used for edging a formal bed.

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- Q6** Distinguish between schemes using dot plants and carpet bedding with **ONE NAMED** example of **EACH**.

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- Q7** Explain the uses of a verticutter in turf maintenance.

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- Q8** Name **TWO** types of seeder available for sowing seeds in prepared seed beds.

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Please turn over/.....

## ANSWER ALL QUESTIONS

MARKS

**Q9** Name **TWO** distinct ornamental trees suitable for a small front garden.

**2**

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**Q10** Define **EACH** of the terms in relation to tree production:

- i) top working;
- ii) bottom working.

**2**

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



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**MODULE J**

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Plant Selection, Establishment & Maintenance  
Hardy Ornamental Nursery Stock**

**Sections B, C & D – Structured Questions**

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

- i) The duration of the papers in Module **J** is **2 hours**.
- ii) Answer **ONE** question only from **EACH** of the sections **B,C** and **D**.
- 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.

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

## Section B – Establishment & Maintenance of Decorative Ornamental Turf

**Answer ONE question only from this section**

		<b>MARKS</b>
<b>Q1</b>	a) Describe in detail the maintenance over the course of one year for an area of fine turf.	<b>12</b>
	b) Specify the tools and equipment used to carry out the operations stated in a).	<b>8</b>
<b>Q2</b>	Describe how environmental conditions can be adjusted to minimise the establishment and spread of <b>EACH</b> of the following problems:	
	i) moss;	<b>6</b>
	ii) <b>4 NAMED</b> weeds;	<b>8</b>
	iii) <b>2 NAMED</b> diseases.	<b>6</b>

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

## Section C – Plant Selection, Establishment & Maintenance

Answer ONE question only from this section

		MARKS
Q3	a) Explain the importance of the plant/animal balance in the maintenance of a garden pond.	8
	b) Devise an annual maintenance schedule for a garden pond, which includes the following types of aquatic plants:	
	i) floating; ii) growing in containers; iii) submerged.	12
Q4	a) With the aid of a clearly labelled diagram, draw a planting plan for a direct-sown annual bed 2m x 5m, to include <b>SIX NAMED</b> distinct plant species.	8
	b) Produce a schedule for the preparation and maintenance of the bed described in a).	12

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Please turn over/.....

## Section D – Hardy Ornamental Nursery Stock

Answer **ONE** question only from this section

		MARKS
<b>Q5</b>	a) State the characteristics required of a container compost for hardy ornamental nursery stock.	<b>8</b>
	b) <b>NAME FOUR</b> materials which can be used as appropriate alternatives to peat.	<b>4</b>
	c) Describe the formulation for a suitable potting compost mix, for a <b>NAMED</b> hardy ornamental plant.	<b>8</b>
<b>Q6</b>	Describe the production for a <b>NAMED</b> plant, of a 1 year old hedge whip grown from seed, using <b>EACH</b> of the following headings:	
	i) seedbed preparation;	<b>5</b>
	ii) seed treatment and sowing;	<b>5</b>
	iii) crop maintenance;	<b>5</b>
	iv) lifting, grading and storage.	<b>5</b>

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Wednesday 11th February 2009

### MODULE J

#### Establishment & Maintenance of Decorative Ornamental Turf Plant Selection, Establishment & Maintenance Hardy Ornamental Nursery Stock

<b>Candidates Registered</b>	<b>45</b>		<b>Total Candidates Passed</b>	<b>37</b>	<b>92.50%</b>
Candidates Entered	40	88.89%	Passed with Commendation	13	32.50%
Candidates Absent	3	6.67%	Passed	24	60.00%
Candidates Deferred	1	2.22%	Failed	3	7.50%
Candidates Withdrawn	1	2.22%			

#### Section A – Short Answer Questions

- Q1** Give **TWO** suitable examples of bulbs **OR** corms for autumn display in an ornamental border.

Generally well answered although some candidates gave examples of spring flowering bulbs. In many instances candidates could name the genus but failed to indicate a suitable species or gave names incorrectly spelt.

- Q2** List **FOUR** physical factors to be considered when selecting a site for a new area of fine turf.

This was generally well answered. Chemical, aesthetic or organic factors in the answer were not rewarded.

- Q3** Describe the difference between *Agrostis tenuis* and *Festuca rubra* var. *rubra*.

A larger number of candidates attempted to **describe** the grass species failing to realise **difference** was required.

Better candidates mentioned seed size and plant spread by rhizomes or stolons. Difference in blade colour gained marks as well as preferences for dry or moist soils.

- Q4** List **FOUR** potential hazards when pruning roses.

Generally a well answered question based on sound common sense.

- Q5** Describe the seasonal pruning of a **NAMED** evergreen subject, used for edging a formal bed.

Many candidates chose *Buxus sempervirens*. The question asked for edging a formal bed and for many subjects this species would prove too tall. The cultivar B.s. 'Suffruticosa' would have been a more reasonable example. This would require less frequent clipping than the species.

In some instances no tools were mentioned or ones that were inappropriate such as secateurs. The use of topiary clippers, hand shears or small electric hedge trimmers was rewarded. Better answers acknowledged the need for level and formal battered or straight-sided shapes. No candidates recommended the use of templates as a guide while a few sensibly recommended a garden line. Subjects suited to larger hedges and informal hedges were not awarded.

- Q6** Distinguish between schemes using dot plants and carpet bedding with **ONE NAMED** example of **EACH**.

There seemed to be little knowledge of traditional carpet bedding or the term groundwork in reference to bedding schemes. In many instances candidates confused groundwork with carpet bedding. Most had some knowledge of dot plants but some examples were inappropriate.

- Q7** Explain the uses of a verticutter in turf maintenance.

A poorly answered question. Answers did not differentiate between deep and shallow slitting, although the cutting of grass roots to increase fibrous rooting was often stated, as was the improvement of drainage and aeration and these were rewarded.

Verticutting with the object of introducing sand, thereby improving sharp drainage to the existing drains, was often mentioned.

- Q8** Name **TWO** types of seeder available for sowing seeds in prepared seed beds.

So often the candidates gave unnecessary descriptions but failed to name the types of seeder. Some leeway was given for colloquial names but not for gardeners sowing the seed! Seed drill or drill seeder to sow seed in rows; fiddle drill, seed fiddle or fiddle seeder to broadcast seed were rewarded.

Tape seeded or tape drill, and mono seeder, hopper-fed seeder and rotary seeders were also rewarded.

- Q9** Name **TWO** distinct ornamental trees suitable for a small front garden.

There were many good suggestions but forest trees were not suitable. Candidates could not be rewarded when they failed to spell their suggestions correctly.

- Q10** Define **EACH** of the terms in relation to tree production:

- iii) top working;
- iv) bottom working.

The better candidates were aware of at least one example of top working. Some descriptions of bottom working were followed with chip budding roses as an example when the question specifically referred to trees.

## Sections B, C & D – Structured Questions

### Section B – Establishment & Maintenance of Decorative Ornamental Turf

- Q1**
- a) Describe in detail the maintenance over the course of one year for an area of fine turf.
  - b) Specify the tools and equipment used to carry out the operations stated in a).

The first section was generally well attempted. Those candidates with the higher marks generally demonstrated an appreciation of variations in environmental conditions and adjusted the maintenance accordingly. In those cases there was also an appreciation of the need to take account of growth, use and weather.

The marks in the second section were variable but again the best results were obtained by those candidates who took account of the size of the area and were able to refer to both hand tools and mechanical methods.

- Q2**
- Describe how environmental conditions can be adjusted to minimise the establishment and spread of **EACH** of the following problems:

- i) moss;
- ii) **4 NAMED** weeds;
- iii) **2 NAMED** diseases.

The aim of this question was to elicit information on maintenance (operations and tools) specifically for fine turf.

Those obtaining good marks in the first section were able to explain fully the reasons for moss being able to invade turf and therefore identify cultural methods of prevention and control.

The successful candidates in the second section named four **common** turf weeds and were able to explain how they were spread and how they were able to survive in mown turf.

The third section presented more difficulty for the candidates. Those who did well in this section were able to explain the conditions favouring the common diseases and how to reduce the chances of invasion.

Recommendation:

Candidates should realise that a full answer describing professional turf management is required.

## Section C – Plant Selection, Establishment & Maintenance

- Q3**
- a) Explain the importance of the plant/animal balance in the maintenance of a garden pond.
  - b) Devise an annual maintenance schedule for a garden pond, which includes the following types of aquatic plants:
    - i) floating;
    - ii) growing in containers;
    - iii) submerged.

The aims of this question were initially to seek out information on water quality in relation to pond size/plants/stocking rates. Secondly, knowledge was needed concerning the annual cycle of maintenance relating to a typical range of aquatic plants.

Significant points of information for the first part which required discussion were- pond size (depth/surface area), plants (types/vigour), fish numbers, quality of water (nitrate levels, oxygen/carbon dioxide, pH). For the second part of the question a seasonal schedule was required, this should have included comment on planting, division, feeding, cutting back, controlling vigorous types, controlling duckweed, blanket weed.

Candidates made reasonable attempts at this question. Those scoring well in part a), were able to relate plant/animal factors and their affect on the components of water quality. Average marks were awarded to those who simply described vegetation, fish numbers and did not relate them to the concept of water quality. Some comprehensive maintenance schedules for part b) were given.

Recommendation:

One tip for future reference, when asked for annual maintenance schedules for any planted area, it is much easier to categorise/describe the activities season by season as opposed to month by month.

- Q4**
- a) With the aid of a clearly labelled diagram, draw a planting plan for a direct-sown annual bed 2m x 5m, to include **SIX NAMED** distinct plant species.
  - b) Produce a schedule for the preparation and maintenance of the bed described in a).

The aims of this question were to seek out the candidate's knowledge of planning & maintaining a hardy annual border.

Significant assessment points for part a) were to label 6 named hardy annuals on a simple plan, locating shorter species to the outside (*Limnanthes douglasii*), taller types to the centre (*Helichrysum bracteatum*). For the second part a suitable schedule should have included information on primary/secondary cultivations, producing a tilth, marking out drifts/areas to be sown in sand, sowing in drills, thinning out, weeding, staking, watering, dead heading, control of pests & diseases, maintaining edge of bed.

There were some good responses to this question. However there was a significant minority of candidates who selected tender plants instead of, woody & herbaceous perennials, which were clearly unsatisfactory for part a).

Recommendations:

In questions such as this, deal with annual maintenance programmes season by season and not month by month.

## Section D – Hardy Ornamental Nursery Stock

- Q5**
- a) State the characteristics required of a container compost for hardy ornamental nursery stock.
  - b) **NAME FOUR** materials which can be used as appropriate alternatives to peat.
  - c) Describe the formulation for a suitable potting compost mix, for a **NAMED** hardy ornamental plant.

The aims of the question were to encourage candidates to understand the components of container composts for HONS and to apply this to the formulation for a suitable compost for a specific plant.

Many candidates answered this well, showing a good understanding of how composts for HONS are formulated and what their most important characteristics are.

Important characteristics to state would be

- Sterile –pathogen free
- Free from weeds and weed seeds
- Correct pH for plant subject
- Adequate nutrients
- Good CEC to hold nutrients
- Good AFP
- Holds moisture
- Gives container plant stability
- Does not slump or break down quickly
- Allows good root development
- Consistent

Environmental considerations and sustainability are peripheral benefits, not core to the characteristics of a HONS compost.

Candidates were in some cases confused about which peat alternatives were appropriate for HONS use. Peat alternatives which could be used for mulching or general structural improvement are not appropriate for use in a unit which is considering HONS, and a question relating throughout to container compost mixes. Appropriate materials would be

- composted bark
- composted municipal waste
- composted garden waste
- composted paper waste
- composted sawdust
- sterilised loam/soil

Materials such as spent mushroom compost, composted seaweed and sewage sludge are not generally used in container mixes, only as mulches.

The question asks for a suitable potting compost mix, for a **NAMED** hardy ornamental plant. Candidates were expected to give either a general commercial compost mixture, or to give the formulation for a suitable mix such as a John Innes blend, numbers 2 or 3. Many candidates gave a specification for JI no 1; although it was impressive to see a very good recollection of the basic composition of JI blends, it was a little disappointing that only a few candidates showed an understanding of the cumulative levels of nutrients in the different formulations. The JI no 1 mix would only contain adequate nutrients for potting up cuttings. An answer using this mixture would be acceptable if it pointed out this deficiency. Commercial mixes should include slow release fertiliser and additives such as Suscon Green. Candidates specifying ericaceous subjects generally gave good specific mixes.

Recommendations:

Answers to questions such as this should be carefully specified so that irrelevancies are not included.

#### Q6

Describe the production for a **NAMED** plant, of a 1 year old hedge whip grown from seed, using **EACH** of the following headings:

- v) seedbed preparation;
- vi) seed treatment and sowing;
- vii) crop maintenance;
- viii) lifting, grading and storage.

The aim of this question was to elicit from candidates a detailed description of the raising of a hedge whip in a professional situation.

This question was less popular with candidates. The clear prompts for each part of the production process given in the question were designed to guide the candidates through their answer. However marks could not be allocated where production methods described were not appropriate to the chosen plant, nor to the wording of the question.

There was some confusion about suitable seedbed preparation: Dunemann

seedbeds are used for growing conifers, and most candidates chose *Crataegus* or *Corylus*. Ground preparation should commence the previous year with (ideally) grass ley or fallow ground, removing perennial weeds, then enriching with manure. Seedbeds are usually raised by machine.

Seed treatments for dormancy breaking varied considerably, and many were very elaborate and accurate, but with commercial production the simplest method is likely to be the one used. Sowing *Crataegus* seed in summer for germination next spring avoids more costly treatments and so this is likely to be the commercial choice. Seed sowing was generally not described in detail – in terms of appropriate density (germination calculations) method of sowing (broadcast or drills) and cover (grit or soil) for each named plant.

Most candidates realised that weeding and watering are important in crop maintenance, but few mentioned the need for frost protection and shading in summer for young plants.

Undercutting was mentioned by many candidates in the fourth part, though only a few explained that seedlings could be left in place after undercutting to make a further year's growth. For one year hedging whips containerisation was not an appropriate option. Many candidates gave a good general account of the grading process, even without knowledge of commercial grading requirements. Some candidates did not seem to realise that grading in the field means lifting only those which conform to requirements, leaving the others in situ to grow on. Storage requirements (cold store, heeling in) were generally well described.

Recommendation:

Detail of an actual commercial situation needs to be included in answers to questions such as this.

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