



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

2:00pm Wednesday 6th July 2011

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 Describe the pruning of a **NAMED** flowering shrub used for hedging. **2**

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Q2 Name **FOUR** grass species suitable for including in a seed mix for a wild flower meadow. **2**

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Q3 State **TWO** advantages of hollow tine compared with solid tine aeration. **2**

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Q4 State a fertiliser programme for autumn feeding of a quality lawn. **2**

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Please see over/.....

ANSWER ALL QUESTIONS

MARKS

- Q5** List **TWO** advantages and **TWO** limitations of using cylinder mowers pulled behind a tractor.

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- Q6** State **FOUR** appropriate methods of supporting herbaceous perennials in a border.

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- Q7** Identify **FOUR** shrubs from different genera grown for:

- i) winter flowering;
- ii) winter scent;
- iii) coloured leaves;
- iv) ornamental fruits.

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Please turn over/.....

ANSWER ALL QUESTIONS

MARKS

Q8 Describe **FOUR** methods of protecting outdoor workers from weather in the HONS industry.

2

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Q9 Describe the characteristic features of a suitable compost for **EACH** of the following:

- i) alpiners;
- ii) heathers.

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Q10 Describe the process of grading seedlings in preparation for lining out.

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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

		MARKS
Q11	a) Explain why weeds and moss are detrimental to ornamental lawns.	4
	b) Describe how to use chemicals effectively to control EACH of the following in turf:	
	i) perennial weeds;	4
	ii) moss.	4
	c) Describe TWO distinct methods of cultural control of EACH of the following:	
	i) perennial weeds;	4
	ii) moss.	4
 Q12	 Describe, with reference to the maintenance of an amenity lawn in public use, EACH of the following:	
	i) pest and disease control;	5
	ii) seasonal fertilisation programme;	5
	iii) turf equipment and machinery used;	5
	iv) health and safety considerations.	5

Please see over/.....

Section C – Plant Selection, Establishment & Maintenance

Answer **ONE** question only from this section

		MARKS
Q13	a) Name and describe FOUR plants suitable for a winter display in a large container.	6
	b) Name and describe FOUR plants suitable for a summer display in a large container.	6
	c) Explain how to maintain the quality of display for the plants selected in a) and b).	4
	d) Name FOUR plants that would be suitable for display through summer and winter.	4
 Q14	 Describe an appropriate planting technique for EACH of the following:	
	i) a NAMED climber against a south facing wall;	5
	ii) a container grown standard tree in the centre of an established lawn;	5
	iii) a NAMED hedge planted as whips;	5
	iv) a NAMED bulb in a heavy soil.	5

Please turn over/.....

Section D – Hardy Ornamental Nursery Stock

Answer **ONE** question only from this section

MARKS

- Q15** For the field production of a **NAMED** hardy herbaceous plant:
- a) Describe the preparation of the site for planting. **6**
 - b) List **TWO** advantages and **TWO** limitations of **EACH** of the following:
 - i) hand planting;
 - ii) machine planting. **8**
 - c) State **SIX** factors that affect the quality of plant material for planting in the field. **6**
-
- Q16** Produce a management plan for growing a crop of container grown conifers under **EACH** of the following headings:
- i) standing ground maintenance; **4**
 - ii) spacing and support; **4**
 - iii) watering and feeding; **4**
 - iv) pest and disease control; **4**
 - v) weeding and other routine maintenance. **4**

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

Candidates Registered	76		Total Candidates Passed	55	96.49%
Candidates Entered	57	75.0%	Passed with Commendation	40	70.18%
Candidates Absent	8	10.53%	Passed	15	26.32%
Candidates Deferred	6	7.89%	Failed	2	3.51%
Candidates Withdrawn	5	6.58%			

Section A – Short Answer Questions

Q1 Describe the pruning of a **NAMED** flowering shrub used for hedging.

It was generally appreciated that most flowering hedges are pruned immediately after flowering, so allowing a full season's growth for flowering wood to form for the following year. However where summer flowers are followed by decorative fruits as part of the display, pruning must be delayed until autumn or winter. Mediterranean plants are best cut back in summer immediately after flowering so new growth can harden for winter as September pruning and a mild autumn produces growth liable to frost damage.

Q2 Name **FOUR** grass species suitable for including in a seed mix for a wild flower meadow.

Any low growing species not likely to overwhelm the flowering plants were rewarded but not vigorous rye grasses or other coarse growing *Poaceae*.

Q3 State **TWO** advantages of hollow tine compared with solid tine aeration.

The compaction by solid tines was cited but rarely the smearing action in heavy soils that can make the indentations impermeable to water. Improved air circulation, cutting thatch and opportunity to incorporate top dressing and also the greater depth achievable with hollow tining were correctly quoted advantages.

Q4 State a fertiliser programme for autumn feeding of a quality lawn.

Few candidates opted to state the ratios of N.P.K in autumn fertiliser but understood, and at length explained the action of these nutrients when preparing sward for winter. It was generally understood that nitrogen applied late in the season would lead to soft growth and make the turf liable to winter damage.

Q5 List **TWO** advantages and **TWO** limitations of using cylinder mowers pulled behind a tractor.

A possible advantage was stated that this combination is able to cover a large area quickly. Comparison was made with the time taken by a pedestrian mower. It was appreciated the scissor action of the cylinder mowers would give a better finish than rotary heads.

The lower purchase cost of gangs versus hydraulic units was not appreciated. No answers picked up that trailed gangs are unsuited to road transport. There were references to the speed of coupling and preparation being time consuming but little appreciation that the alternative hydraulic units are quick to attach.

Possible limitations included that on uneven ground, bounce accentuates the bumps and so cutters miss the grass. Gangs are driven by wheel contact with the ground so may skip and skid in wet conditions but this was not picked up although that ribbing occurs at inappropriate speeds was mentioned in some answers.

Q6 State **FOUR** appropriate methods of supporting herbaceous perennials in a border.

Answers listed hazel or birch twigs, 'link stakes', mesh circles on legs, obelisks, canes and twine, and horizontal netting supported on stakes. The best answers also gave examples of suitable herbaceous perennials for each support system.

Q7 Identify **FOUR** shrubs from different genera grown for:

- i) winter flowering;
- ii) winter scent;
- iii) coloured leaves;
- iv) ornamental fruits.

- i) Winter flowering shrubs, shrubs flowering December to February, were rewarded but spring flowering species did not gain marks.
- ii) The winter scented shrubs proved more difficult – *Jasminum nudiflorum* has no perfume.
- iii) Many answers named shrubs with autumn colour for coloured foliage and this was allowed but not citing green-leaved shrubs without the cultivar name of its variegated counterpart.
- iv) Candidates were able to name a range of shrubs that bear ornamental fruits.

Q8 Describe **FOUR** methods of protecting outdoor workers from weather in the HONS industry.

Surprisingly this question provoked a great deal of thought. The following were rewarded:

- protection from the rain afforded by waterproof clothing, waterproof coat and leggings for wet weather,
- wellington boots or 'Muck Boots' (insulated wellington boots) worn in muddy wet conditions,
- warm clothing, for instance sweatshirts and down waistcoats, to insulate against the cold, along with leather or fleece lined gloves against cold hands,
- sun hat and sun cream for UV protection in sunny weather,
- the provision of drinking water in hot weather.
(Shorts were not rewarded as they leave legs open to sunburn, scratches and insect bites.)

Many answers included keeping workers under cover in temporary shelters, packhouses and polytunnels but this would make them indoor workers rather than outdoor as the question asked. One stated indoor or sheltered workplace was allowed for use in extreme weather conditions.

Q9 Describe the characteristic features of a suitable compost for **EACH** of the following:

- i) alpiners;
 - ii) heathers.
-
- i) The best answers stated a free draining, open loam-based compost with 30-50% alpine grit is needed for alpiners with pH adjusted according to the species requirements but usually pH 6.5.
 - ii) For heathers an organic based, water retentive but free draining compost is needed at pH 5.5 and this should be stated as it indicates more adequately the candidates appreciation of the need for an acid compost rather better than just stating 'ericaceous mix'.

Candidates cited peat as a constituent in the mixes but for environmental reasons this should be avoided in favour of other sources of organic matter, for instance, pine needles or composted bark or bracken.

Q10 Describe the process of grading seedlings in preparation for lining out.

The key word in this question was 'process'. It starts with realisation that the seedlings should be kept cool, moist and shady (protected from the elements) at all times after they have been carefully lifted to avoid root and/or shoot damage. They must be checked for obvious pests and diseases. Seedlings should have a healthy tap or fibrous root system in balance with top growth and be true to type. Any not meeting these criteria are destroyed. Finally batches of similar vigour, height, girth and development are batched together. Many candidates stated some criteria, few appreciated the complete process.

Sections B, C & D – Structured Questions

Section B – Establishment & Maintenance of Decorative Ornamental Turf

- Q11** a) Explain why weeds and moss are detrimental to ornamental lawns.
- b) Describe how to use chemicals effectively to control **EACH** of the following in turf:
- i) perennial weeds;
 - ii) moss.
- c) Describe **TWO** distinct methods of cultural control of **EACH** of the following:
- i) perennial weeds;
 - ii) moss.

In the first part of the question statements like they harbour pests and diseases are not of any value without the candidates giving some examples.

In part b) candidates were not sure which chemical controlled which weeds. (e.g. 2,4-D for the control of clover, annual meadow grass and moss)

Many candidates did not say anything about application of chemicals, in relation to health and safety, weather conditions and the stages of plant growth.

Many candidates suggest spot treatment with glyphosate but this is not approved for lawn treatment and therefore cannot be accepted as a method of chemical control on lawns. Subsequently no marks were given for this statement.

In part c) Few candidates had any understanding of how sulphate of iron affects moss and how it interacts with grasses. There was also a poor understanding of how sulphate of iron can be applied, and the time period between application and the moss turning black, and being removed (examples ranged from a few days to six weeks).

- Q12** Describe, with reference to the maintenance of an amenity lawn in public use, for **EACH** of the following:

- i) pest and disease control;
- ii) seasonal fertilisation programme;
- iii) turf equipment and machinery used;
- iv) health and safety considerations.

Very few candidates did this question. Candidates showed little understanding of the biology of turf diseases like, fusarium, red thread and dollar spot. Very few candidates could give a clear indication of fertilizer requirement; many said low nitrogen in autumn but still gave 6%N or above if any indication was given at all. There was a poor lack of knowledge when dealing with machinery, candidates showed a lack of understanding of the range of modern equipment available for turf maintenance. The final section was usually well done with most candidates being aware of general health and safety requirements. Candidates do not need to produce a long list of every item of personal protective equipment.

Section C – Plant Selection, Establishment & Maintenance

- Q13**
- a) Name and describe **FOUR** plants suitable for a winter display in a large container.
 - b) Name and describe **FOUR** plants suitable for a summer display in a large container.
 - c) Explain how to maintain the quality of display for the plants selected in a) and b).
 - d) Name **FOUR** plants that would be suitable for display through summer and winter.

For parts a) & b) botanical names plus a description of the plant's qualities were required. For example, Viola Avalanche Blue, an F1 hybrid, winter flowering, blue/purple in colour, creeping habit.

For part c), an explanation of four relevant cultural activities was required. These could be watering, feeding, pruning, staking/supporting, or any other relevant practice. For example, watering should be related to season/plant type and the method given, e.g. by hand, or some form of automatic system (trickle).

For part d) botanical names only were required.

For parts a) b) & d) a wide range of plants and plant types were permissible a complete range of ornamentals,(not just bedding),also fruit, vegetables and herbs, providing they give interest at the appropriate season. The majority of candidates selected ornamentals, and provided many good selections.

For part c) it was not sufficient to simply list the cultural activities as bullet points-some degree of relevant explanation/application was needed to score well (see comments on watering above).

Q14 Describe an appropriate planting technique for **EACH** of the following:

- i) a **NAMED** climber against a south facing wall;
- ii) a container grown standard tree in the centre of an established lawn;
- iii) a **NAMED** hedge planted as whips;
- iv) a **NAMED** bulb in a heavy soil.

Appropriate expansion was required on the significant assessment points listed below-

- i) *Wisteria sinensis*, prepare a hole 45cm from the wall, add organic matter, remove rubble, position climber at 45 degrees leaning towards wall, attach to support, backfill/water, trim off any damaged stems, mulch.
- ii) Container tree-remove turf, keep a minimum of 60cm diameter of clean soil immediately around tree, ensure rootball is moist, square hole, soil preparation/backfilling, ameliorants-mycorrhiza, low angled stake/tie, mulch.
- iii) *Prunus spinosa*, notch plant, dormant season, staggered rows, weed control, rabbit guards.
- iv) *Fritillaria meleagris*, plant September/November, 10/15cm depth, place on side, surround with coarse sand.

Many good answers were provided by candidates. The significant assessment points listed above were not exclusive, and a number of techniques/practices are open to opinion. This is very relevant to tree planting. Providing the practice was based on sound horticultural method, and then credit would be given. For example, recent tree planting methods have argued the case for a wider cultivated area, less deep and minimal use of organic ameliorants.

Section D – Hardy Ornamental Nursery Stock

Q15 For the field production of a **NAMED** hardy herbaceous plant:

- a) Describe the preparation of the site for planting.
- b) List **TWO** advantages and **TWO** limitations of **EACH** of the following:
 - i) hand planting;
 - ii) machine planting.
- c) State **SIX** factors that affect the quality of plant material for planting in the field.

A surprising number of candidates failed to name a hardy **herbaceous** plant.

Most were able to describe the preparation of a site for planting, yet there was some confusion about the use of residual herbicides prior to planting out.

The advantages and limitations of both hand planting and machine planting were well understood.

Most candidates were able to identify the growing factors affecting the quality of plant material, however those that gained most marks included BS standards, virus testing etc.

Q16 Produce a management plan for growing a crop of container grown conifers under **EACH** of the following headings:

- i) standing ground maintenance;
- ii) spacing and support;
- iii) watering and feeding;
- iv) pest and disease control;
- v) weeding and other routine maintenance.

Most candidates were able to identify suitable standing ground and its maintenance. Candidates who included pest and disease control and possible browning from touching foliage, routine re-spacing and the problems of plants blowing over gained most marks in part b).

Part c) was generally well answered. Those who identified the pests and diseases and the control measures in part d), gained most marks.

Weed control on a commercial nursery was not well demonstrated, though most candidates understood the problem of weeds. There was very little mention of pruning as part of the routine maintenance of the crop.

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