



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

10:00am Wednesday 10th February 2010

MODULE I

**Restoring Established Ornamental Gardens
Planning Layout & Construction of Ornamental Gardens**

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 I 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** List **FOUR** sequential stages in ground preparation needed in order to lay a turf lawn.

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- Q2** State **TWO** reasons for the failure of land drains in a garden.

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- Q3** Name **TWO** types of bond used in the construction of a single brick wall.

2

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Please see over/.....

ANSWER ALL QUESTIONS

MARKS

Q4 State how the soil type influences the spacing of land drains.

2

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Q5 State **TWO** ways of protecting a specimen tree during renovation work.

2

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Q6 State **ONE** method of calculating the number of steps required for a slope in a domestic garden.

2

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Q7 State **FOUR** health and safety considerations to be reviewed when erecting a panel fence.

2

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Please turn over/.....

ANSWER ALL QUESTIONS

MARKS

Q8 Describe **ONE** method of marking out a curved boundary on site. **2**

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Q9 State **FOUR** characteristics of the Italian garden style. **2**

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Q10 State the significance of **EACH** of the following in the construction of a patio:

- i) datum peg;
- ii) string lines.

2

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MODULE I

**Restoring Established Ornamental Gardens
Planning Layout & Construction of Ornamental Gardens**

Sections B & C - Structured Questions

IMPORTANT – Please read carefully before commencing.

- i) The duration of the papers in Module I 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.

Please turn over/.....

Section B – Restoring Established Ornamental Gardens

Answer **ONE** question only from this section

		MARKS
Q11	a) Explain why it is important to consider at an early stage, the intended purpose and use of both the original and restored garden.	4
	b) Explain how mature plantings of a high ornamental value may impact on garden restoration.	8
	c) Explain with the use of examples, the methods available to prevent the loss of existing plantings.	8
Q12	a) Identify the principal design style of ONE NAMED Victorian garden designer.	4
	b) Explain the influences on a NAMED Victorian garden style.	6
	c) Describe, with NAMED plant examples, how the design style selected in b) is achieved.	10

Please see over/.....

Section C – Planning Layout & Construction of Ornamental Gardens

Answer TWO questions from this section

	MARKS
Q13 a) List TEN factors to be assessed for an overall site appraisal.	5
b) Explain how FIVE of the factors listed in a) impact on garden planning and layout.	10
c) Describe TWO methods of locating NAMED underground services.	5
 Q14 a) Describe how scale drawings can be interpreted in order to physically mark out the boundaries of a site.	 4
b) Describe how contour lines and plan sections are used to set out the required levels on site.	8
c) Describe how to mark out an ellipse in soil, which has a long diameter of 4 metres.	8
 Q15 a) Evaluate EACH of the following materials for their suitability in the design and construction of a path in a domestic garden:	
i) paving slabs;	3
ii) bark;	3
iii) cobbles.	3
b) Describe, with the aid of a clearly labelled cross-section diagram, the construction of a paving slab path on sandy soil, clearly specifying materials and dimensions.	6
c) Identify the hazards to be recorded in a risk assessment for the installation of a paving slab path.	5

Please turn over/.....

Section C – Planning Layout & Construction of Ornamental Gardens

Answer TWO questions from this section

	MARKS
Q16 a) Describe the ground preparation requirements for EACH of the following features:	
i) a brick wall 1 metre high on a clay soil;	5
ii) a block paved driveway to be constructed higher than the existing soil level.	5
b) Describe the ground preparation techniques needed to develop a gravel garden suitable for growing drought resistant plants.	10

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MODULE I

Restoring Established Ornamental Gardens Planning Layout & Construction of Ornamental Gardens

Candidates Registered	77		Total Candidates Passed	62	92.54%
Candidates Entered	67	87.01%	Passed with Commendation	18	26.87%
Candidates Absent	9	11.69%	Passed	44	65.67%
Candidates Deferred	0	-	Failed	5	7.46%
Candidates Withdrawn	1	1.30%			

Section A – Short Answer Questions

Q1 List **FOUR** sequential stages in ground preparation needed in order to lay a turf lawn.

This was generally answered well, successful candidates gave the four points from below:

- Clear debris/weeds;
- Dig over/rotovate;
- Remove stones;
- Rake to level;
- Consolidate;
- Rake to adjust levels to a fine tilth.

Q2 State **TWO** reasons for the failure of land drains in a garden.

A well answered question with reasons such as compaction of drains by heavy machinery, silting of drains, obstruction, infestation by tree roots, rise in water table and failure to keep outflow clear.

Q3 Name **TWO** types of bond used in the construction of a single brick wall.

Candidates who answered this to show that they understood the term 'single brick' wall gained marks ie Flemish garden bond, English garden bond, rat- tail, header bond.

Q4 State how the soil type influences the spacing of land drains.

Many candidates provided good explanations and some gave spacings, although they were not asked for. The distance between drains will be closer in a clay soil than in a loamy or sandy soil. They will be furthest apart in a sandy soil. A clay soil is made up of microscopic particles that 'hold on' to the water. A sandy soil has larger particles and airspaces that allow the water to drain away.

Q5 State **TWO** ways of protecting a specimen tree during renovation work.

Most candidates gave good detailed answers: Fence off the tree as far out from the trunk as the edge of the canopy. Wrap the trunk. Remove low branches to prevent damage if impractical to give a wide enough cordon. Use mat over the roots to prevent compaction, tie back smaller branches. Communication with contractors and training were both rightly stressed.

Q6 State **ONE** method of calculating the number of steps required for a slope in a domestic garden.

The candidates who gained the most marks kept their answers simple and to the point as this was a question that many were confused with. Any workable method was awarded marks. ie Using a spirit level, place a plank of wood horizontally out from the top of the slope and measure vertically to the ground, repeat until the base of the slope is reached. Add all the vertical measurements together and divide by the height of the riser. Some marks were awarded if the principle was correct, but the explanation poor.

Q7 State **FOUR** health and safety considerations to be reviewed when erecting a panel fence.

Most candidates showed a good understanding of the health and safety issues involved. Answers covered use of PPE because of splinters, trip hazards, safe use of electric tools, correct lifting, the hazards involved with mixing of concrete. The best answers related the principles back to the specified situation of erecting fence panels.

Q8 Describe **ONE** method of marking out a curved boundary on site.

Good answers made reference to a plan and were given as simple step by step instructions: to mark out a curved boundary, measure 'off sets' from a known baseline, mark with pegs, lay a heavy rope or hose between the pegs and link to create a smooth curve. The question did not ask how to scribe a circle, which some candidates spent time in providing.

Q9 State **FOUR** characteristics of the Italian garden style.

Candidates showed very good understanding of the characteristics of the Italian style with formal layout, symmetry, use of focal points, use of water in formal pools, fountains, statuary, secret gardens, clipped hedging, limited palette of plants and terraces.

Q10 State the significance of **EACH** of the following in the construction of a patio:

- i) datum peg;
- ii) string lines.

Few candidates gave the full use of the datum peg or the stringlines ie the datum peg to set the finished level of the patio for the full mark, but most did state that it was to do with setting levels which gained half marks. The stringlines are used to set the perimeter of the patio, to aid setting out corners and straight lines. They can also be of use with maintaining the level (or fall) over a large patio. Good answers gave both functions for the stringlines.

Sections B & C – Structured Questions

Section B – Restoring Established Ornamental Gardens

- Q11**
- a) Explain why it is important to consider at an early stage, the intended purpose and use of both the original and restored garden.
- b) Explain how mature plantings of a high ornamental value may impact on garden restoration.
- c) Explain with the use of examples, the methods available to prevent the loss of existing plantings.
- a) Marks were awarded for the answers below regarding plantings in a garden. In addition marks were also given for the existence of the original landscape, whether the landscape is unique, general state of landscape features and plants. Marks were not given for health and safety or facilities such as toilets at this stage in the survey.
- General contribution to the landscape in both historic and aesthetic context;
 - External and internal views may be lost;
 - Privacy will be lost;
 - Open recreational areas may be reduced or over grown;
 - Plant feature loss will alter the character of site.
- b) Marks were awarded for the answer points below:
- Some plantings may differ from the original plan;
 - Plants may require removal;
 - Conservation and landscape protection, TPO and legislation;
 - Choice of plants features to be retained;
 - The need of replacement on historic context;
 - Collective contribution of plantings and features which can be retained;
 - The remedial work on existing plants.
- c) Marks were awarded for answer points below:
- Plot and record all existing plants, be alert to dormant herbaceous species;
 - Confirm identification of all plants with the relevant authority;
 - Label correctly and record;
 - Consider propagation of plants;
 - Note and protect fine specimen plants, eg. Champion trees;
 - Old collection of plants such as old roses, Rhododendron, hedges and topiary, wild and native plants.

- Q12**
- a) Identify the principal design style of **ONE NAMED** Victorian garden designer.
- b) Explain the influences on a **NAMED** Victorian garden style.
- c) Describe, with **NAMED** plant examples, how the design style selected in b) is achieved.
- a) Marks were awarded for the following designers:
- John Claudius Loudon – ‘Gardenesque’ style;
 - William Robinson – informal planting within a formal landscape (though spanning 19th and 20th century, marks were awarded);
 - Gertrude Jekyll landscapes are formal with informal planting (though spanning 19th and 20th century, marks were awarded);
 - James Bateman of Biddulph Grange (features include Chinese garden, Egypt, Stumpery and Italian garden) was also quoted and marks awarded appropriately;
 - Sir Joseph Paxton – conservatory planting, rock gardens and water features;
 - George Forrest – wide range of new plants including Camellia, Rhododendron and Magnolia;
 - Joseph Hooker – landscaping with and introduction of Rhododendrons.
- b) Marks were awarded for the following:
- The use of exotic and introduced plants;
 - Use of picturesque, using introduced plants and features such as rock gardens;
 - Use of specimen plants in lawns;
 - Italianate revival, formal landscapes and use of abstract shaped borders;
 - Greenhouse and conservatories and tropical and sub-tropical plants;
 - Formal seasonal bedding;
 - Specialist plant features such as rose gardens, herbaceous borders, mixed borders, arboreta and rock gardens.
- c) Marks were awarded for selection of plants appropriate to the designer and landscape style:
- Use of trees and shrubs;
 - Herbaceous perennials;
 - Roses;
 - Alpines;
 - Seasonal plants for both summer and spring bedding, this will include the use of bulbs;
 - Mixed borders for colour affects such as those created by Gertrude Jekyll;
 - Landscapes from around the world and the use of the appropriate plants;
 - Decorative water features.

Section C – Planning Layout & Construction of Ornamental Gardens

- Q13**
- a) List **TEN** factors to be assessed for an overall site appraisal.
 - b) Explain how **FIVE** of the factors listed in a) impact on garden planning and layout.
 - c) Describe **TWO** methods of locating **NAMED** underground services.

The aim of this question is to show that the candidate is able to identify the factors which need to be noted during the site appraisal process, to be familiar with the methods of gathering and recording the data and to explain the implications on the planning proposals of a garden site.

- a) This part of the question was generally well answered with the majority of candidates being able to list ten factors including dimensions, contours, orientation, aspect, altitude, exposure, shelter, soil, drainage, existing vegetation, structures, access, services, views and other external factors. A list was all that was required and some candidates wasted time by including an explanation in their answer. In some cases the factors were not distinctly different, for instance listing existing trees, existing vegetation, presence of TPOs etc all come under the same heading, as do soil texture, structure, depth and pH. In some cases there was confusion between a site appraisal and the client brief.
- b) All candidates were able to explain five of the factors that they had chosen from part a) and those that gained higher marks concentrated on the impact on planning and layout as required in the question. Although important, explanations of the impact at the construction phase were not asked for. For example the dangers of damaging underground services would not have an impact on the planning, but the presence and location of services might influence the placing of proposed features. Likewise access problems to the site during construction would only influence the layout if desired materials or features would be precluded because of their size or weight, or there was a safety issue in the future use of the garden. Better answers discussed the positive attributes and constraints imposed by existing site features and conditions on the functions, both practically and aesthetically, of the proposed garden developments. Many answers quoted aspect, orientation, exposure, shelter or microclimates as being important to the selection of plants but didn't discuss the practical issues or comfort of the garden users.
- c) Marks were awarded for naming two distinctly different methods along with a detailed description as to how the methods are implemented. Most candidates were able to name two methods but often they were too similar, the terminology was incorrect and descriptions lacked detail or were absent all together. Particularly, descriptions of the use of electronic cable and pipe detection devices were generally very poor. Many candidates quoted plans or maps as a method but then were confused as to where they might be obtained. Many answers included methods of archaeological surveying which would not be appropriate for general garden planning purposes.

- Q14**
- a) Describe how scale drawings can be interpreted in order to physically mark out the boundaries of a site.
 - b) Describe how contour lines and plan sections are used to set out the required levels on site.
 - c) Describe how to mark out an ellipse in soil, which has a long diameter of 4 metres.

The aim of this question is to show that the candidate is able to set out vertical and horizontal features from a range of scale drawings.

This question was only answered by two candidates nationally so no general remarks can be made as to candidates' performance.

- a) a) This part of the question required an explanation to include the following techniques of setting out from selected baselines and fixed points on a scale drawing:
 - Triangulation;
 - Offsets;
 - Extension lines from a building;
 - Application of 345 triangles / site squares;
 - Running measurements;
 - The preference of using written dimensions off drawing over scaling off drawing using a scale rule;
 - Interpretation of symbols and keys;
 - Use of bearings (Eastings) if appropriate instruments are available for setting out (Theodolites, EDMs or Total Stations);
 - Orientation and location of north point.
- b) Answer should include:
 - Identification and calculation of heights at appropriate points to set up base lines, grids or individual spot heights from the contours on a plan drawing – their spacings, positioning and orientation being dependant on existing ground levels and proposed level changes and features;
 - Identification of BS symbols for existing and proposed levels;
 - Understanding of ordnance and temporary bench marks and the site datum and how they are expressed and indicated on plans and section drawings;
 - Identification of how section drawings are located on a plan drawing and setting out a base line appropriately from the section line indicated on the plan drawing;
 - To include good clear labelled and dimensioned diagrams.
- c) Answer required an explanation, including explicit diagrams, of method:
 - Marking out long axis;
 - Appropriate method of marking out cross axis at right angles;
 - Method of measuring and marking points within long axis to locate string line “pivot” points;
 - Setting up of string line around correct points;
 - Scribing around with string line using appropriate marking technique.

Q15 a) Evaluate **EACH** of the following materials for their suitability in the design and construction of a path in a domestic garden:

- i) paving slabs;
- ii) bark;
- iii) cobbles.

- b) Describe, with the aid of a clearly labelled cross-section diagram, the construction of a paving slab path on sandy soil, clearly specifying materials and dimensions.
- c) Identify the hazards to be recorded in a risk assessment for the installation of a paving slab path.

The aim of this question is to show that the candidate has an understanding of the physical, aesthetic and practical properties of the materials used in a range of common garden features and to be able to specify the construction details of the features. To be able to state the health and safety requirements when carrying out landscape construction operations.

- a) Candidates gaining higher marks discussed the advantages and disadvantages of each surface relating to cost (purchase, construction and maintenance), durability and load bearing, frost resistance, longevity, maintenance requirements, ease of installation, slip resistance, aesthetics and design considerations, safety, child friendliness, disabled considerations etc. This part of the question was mostly well answered with the majority of candidates showing a good knowledge of the materials. There was some confusion however over the definition of “cobbles”, with some interpreting them to be large beach pebbles and others square stone blocks, usually of granite, as found on a cobbled street, and in some cases it was not clear that the candidate understood the term at all. Answers should avoid the use of words such as “relatively” when describing a property without quoting what it is relative to – just to say a paving slab is “relatively cheap” is not sufficient.
- b) Marks were awarded to answers which included, either in the drawing or text, detailed specifications and dimensions of the following: sub-grade, formation, drainage and falls, sub-base/base, membranes, blinding, bedding, wearing course, pointing/jointing. Most candidates had a sound knowledge of the construction requirements but many were then let down by being unable to provide technical specifications in adequate detail. Drawings in almost all cases were of a poor standard. Although providing adequate construction details, many answers failed to explain the significance of their choice of foundation for a sandy soil. There was confusion in some cases between slab paving, block paving and in-situ concrete paving which resulted in incorrect hybrid specifications.
- c) Marks were awarded for identification of hazards to include - access arrangements, open excavations, underground services, heavy and awkward materials (manual handling), trip hazards, hazardous substances – ie cement, excavation operations, injury from use of named tools, machines and equipment and lack of training, electricity and fuel (mixers and cutters etc), dust, noise, flying debris etc. The question asked for an identification of the hazards involved in all the processes of constructing a paving slab path. Worryingly there was a lot of confusion as to what a hazard is within the risk assessment process with many candidates describing the risks and precautions, either in place or to be implemented, such as PPE, signage and exclusion. However in some cases it may have helped in the explanation to identify who might be at risk – for example the operative, or if children could gain access to the site.

Q16 a) Describe the ground preparation requirements for **EACH** of the following features:

- i) a brick wall 1 metre high on a clay soil;
- ii) a block paved driveway to be constructed higher than the existing soil level.

b) Describe the ground preparation techniques needed to develop a gravel garden suitable for growing drought resistant plants.

The aim of this question is to show that the candidate has an understanding of ground preparation techniques in relation to the construction of hard and soft landscape features across a range of soil types.

- a) Marks were awarded in each case for providing suitable descriptions to include: removal of all topsoil (pore spaces, organic matter causing settlement) to safe bearing area of subsoil, shrinking and swelling of clay soils, effects of frost, appropriate depths and dimensions, compaction of sub grade, drainage (existing and proposed), levels and/or falls, membranes if appropriate, how to deal with made up ground. Appropriate tools, machinery and equipment needed to be quoted for each task. Although most answers included basic excavation and compaction techniques, few referenced this with an explanation of the specific requirements to the particular situation asked for in the question. Exact dimensions were sometimes quoted without any explanation as to how these were arrived at and with no reference to finished or existing levels. Candidates often described the installation of foundations for the given features or even construction details of the features themselves which were not asked for in the question.
- b) Marks were awarded for descriptions of techniques to include methods and timing of weed eradication, existing and future drainage requirements, levelling (grading), subsoiling, primary and secondary cultivation (quoting tools, machinery and equipment), fertility considerations, soil amelioration (organic or inorganic materials as appropriate), use of membranes and mulches. Appropriate depths and dimensions needed to be quoted. In most cases there was an understanding of the requirement for good drainage but often this was not adequately addressed in the description of the ground preparation techniques. Some candidates suggested improving the soil conditions or adding irrigation which is not the object of the question in growing drought resistant plants. There was often confusion in the application and depths of the gravel mulch or in the use of a membrane.

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