RHS LEVEL 3 ADVANCED/DIPLOMA IN HORTICULTURE
WRITTEN EXAMINATION

10.00am Wednesday 11th February 2009

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 Name **TWO** organisations involved in heritage garden restoration. **2**

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Q2 List **FOUR** criteria that can be used to assess the condition and future life expectancy of plants. **2**

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Q3 List **FOUR** health and safety considerations when renovating an old overgrown wooden pergola. **2**

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Please see over/…..

ANSWER ALL QUESTIONS

MARKS

Q4 Describe the method used to plot the position of trees during a linear survey. **2**

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Q5 Name **FOUR** points to consider when constructing a flight of garden steps. **2**

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Q6 Describe the safety factors to be considered when operating a vibrating plate compactor (whacker plate). **2**

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Q7 Name **FOUR** types of surface suitable for use in a children's play area. **2**

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Please turn over/…..

ANSWER ALL QUESTIONS

MARKS

Q8 Describe how a small stream on a site may be incorporated into the garden design. **2**

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Q9 State the difference between a ‘strip’ and a ‘raft’ foundation. **2**

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Q10 State the origin and period of a generic garden design style. **2**

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10:00am Wednesday 11TH February 2009

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

Q1 a) Describe the influences which led to the creation of the 18th century English landscape garden. **6**

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b) Describe the features that can be found in a typical landscape designed by Lancelot Brown (1716 – 1783). Make reference to a landscape for which he was responsible. **14**

Q2 a) Describe the use and installation of temporary safeguards to protect both ornamental plantings and hard features when undertaking the restoration of a garden. **6**

b) List and explain the considerations that influence the production of a garden restoration schedule. **8**

c) Describe the circumstances, which may lead to the modification of the restoration schedule. **6**

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Please see over/…..

Section C – Planning, Layout & Construction of Ornamental Gardens

Answer TWO questions only from this section

MARKS

Q3 Explain the factors that influence the planning and layout of a site for an ornamental garden under **EACH** of the following headings:

i)	access;	**4**
ii)	existing utility services;	**4**
iii)	mature trees;	**4**
iv)	soil;	**4**
v)	aspect.	**4**

Q4 a) Describe how a design of a garden is influenced by the style of the house. **4**

b) Distinguish between traditional and contemporary garden styles, using **EACH** of the following headings:

i)	statues;	**4**
ii)	seats;	**4**
iii)	water;	**4**
iv)	screening.	**4**

Q5 a) Describe **THREE** symptoms of bad drainage, which may be recorded during a site appraisal. **3**

b) Draw a large, clearly labelled cross-section of a piped land drainage system for a clay soil, showing dimensions and installation details. **8**

c) State a suitable drainage fall for this system; to describe the equipment required and how it would be used to set up, over a distance of 50m. **9**

Please turn over/…..

:Section C – Planning, Layout & Construction of Ornamental Gardens

			MARKS
Q6	a)	State **THREE** areas on a construction site from which topsoil should be removed prior to any construction work taking place.	**3**
	b)	Describe how topsoil should be stored on site during the construction phase.	**5**
	c)	Review the range of equipment and machinery for contour adjustment on site and state the health and safety implications of its use.	**12**

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RHS LEVEL 3 ADVANCED/DIPLOMA IN HORTICULTURE
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Wednesday 11th February 2009

MODULE I

Restoring Established Ornamental Gardens
Planning Layout & Construction of Ornamental Gardens

Candidates Registered	**54**		**Total Candidates Passed**	**39**	**76.47%**
Candidates Entered	51	94.44%	Passed with Commendation	8	15.69%
Candidates Absent	3	5.56%	Passed	31	60.78%
Candidates Deferred	-	-	Failed	12	23.53%
Candidates Withdrawn	-	-			

Section A – Short Answer Questions

Q1 Name **TWO** organisations involved in heritage garden restoration.

This was generally well answered including any two of the following type of body:
English Heritage
National Trust
The Garden History Society
European Garden Heritage Network
Walled Kitchen Gardens Network
Historic Gardens Foundation
Institute for Garden and Landscape History
Association of Gardens Trust (or named by county ie Kent Garden Trust but not two counties for 2 marks)
International Council on Monuments and Sites

Q2 List **FOUR** criteria that can be used to assess the condition and future life expectancy of plants.

Good answers contained any four of the following points
Age of plant (stage of its life cycle)
Health of plant
Condition of plant (ie damage)
Impingements of site (ie overhanging branches etc)
Quality of flowering/fruiting
Presence of suckers/reverted shoots

Q3 List **FOUR** health and safety considerations when renovating an old overgrown wooden pergola.

Candidates showed a good understanding of issues involved with this job and gave answers listing the potential hazards that could be involved such as
Falling timbers, thorns, etc
Safe use of tools, machinery
Safe use of ladders
Safety/exclusion of visitors to site area
Protective clothing, hard hats, gloves etc
High visibility jackets
Safe handling of overhead wooden beams

Q4 Describe the method used to plot the position of trees during a linear survey.

Good answers explained logically what was to be done rather like a set of instructions ie Take a measured offset, at a right angle, from a known point on a base line/chain line to the tree. Suitable for measuring over short distances

Triangulation, for greater accuracy over a longer distance. Measure the distance from two known points, on base line/chain line to the tree, creating a triangle with the tree forming the third point.
Labelled diagrams are helpful to support the answer.

Q5 Name **FOUR** points to consider when constructing a flight of garden steps.

Marks were given to points that specifically applied to steps rather than those equally applicable to paths etc ie
Gradient
Difference in height
Depth of tread
Height of riser
Inclusion/position of handrail
Accept choice of hard landscaping material if reason for consideration
Need for a retaining wall or not

Q6 Describe the safety factors to be considered when operating a vibrating plate compactor (whacker plate).

This was well done showing good awareness of safety factors and showing an understanding of how the machine works including those points below
Loud noise – ear protection
Weight of machine – steel toe caps (footwear)
Vibrations to worker – limit time on machine
Abrasion to hands – gloves
Awareness of public etc - High vis, exclusion from site
Awarenss of weight of machine and safe lifting practices
Level of experience of operator – training

Q7 Name **FOUR** types of surface suitable for use in a children's play area.

Generally well done including
Wood chippings
Rubber chippings
Wet pour rubber
Rubber tiles
Grass with rubber reinforcement tiles
No mark given for grass alone as only suitable when damp and not hardwearing enough
Sand or pea shingle

Q8 Describe how a small stream on a site may be incorporated into the garden design.

This was well done.1 mark was awarded for the suggestion, further mark for full details or for a second suggestion to show some understanding of design. The question assumed that the stream was already on site, rather than having to be diverted on to the site, several candidates lost marks over this. Many candidates supplied the following good suggestions:

- It could be dammed to create a series of pools with waterfalls, or one large pool.
- It could be planted along its margins with appropriate plants.
- A decorative bridge could be built over it leading to another area.
- It could be canalised into a rill etc.

Q9 State the difference between a 'strip' and a 'raft' foundation.

Marks were gained by showing the key <u>difference</u> as below
A strip foundation is limited to a trench (on the perimeter of area to be built), whereas a raft foundation occupies the whole area (often with a raised edge, often used when the strata has less load bearing capacity).

Q10 State the origin and period of a generic garden design style.

This was generally well answered and some good examples were given showing a good understanding of garden history. Marks were lost by inaccurate dates.
ie The classical landscapes of Italy were the original inspiration for the English landscape movement in the eighteenth century.

Sections B & C – Structured Questions

Section B – Restoring Established Ornamental Gardens

Q1 a) Describe the influences which led to the creation of the 18th century English landscape garden.

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b) Describe the features that can be found in a typical landscape designed by Lancelot Brown (1716 – 1783). Make reference to a landscape for which he was responsible.

a) Some candidates were confused by the design style that existed during this period, some stating that the style was formal or that plant introduction was a major influence on landscapes of this period. The answer points are as follows:

- English landscape movement influenced by Alexander Pope, 'the spirit of the age'.
- William Kent who worked in Italy and studied Italian renaissance art.
- Kent worked at the Stowe where Brown was Head Gardener.
- Kent had a more intimate style in his landscapes, where as Brown is much extensive in style.

b) This section was generally well answered, however, some candidates mistakenly stated that Stourhead was designed by Brown. The answer points are as follows:

- Brown designed up to a 170 landscapes and some 30 houses.
- His style was informal with curving lines to drives, lake edges and mounds.
- Informal landscape right up to the house.
- Large areas of land involved.
- Although Brown's landscapes were informal, his landscapes are a 'sanitised' view of nature with all imperfections hidden.
- Trees were arranged as individuals, small groups, coppices or belts, creating a series of unfolding views.
- It is claimed that Brown used relatively few species of plant, it is now thought that he did use a wide range of flowers.
- Landscapes for which he was responsible include: Claremont in Surrey; Longleat, Wiltshire: Chatsworth, Derbyshire; Alnwick castle, Northumberland; Petworth, Sussex.
- Marks given for use of references.

Q2 a) Describe the use and installation of temporary safeguards to protect both ornamental plantings and hard features when undertaking the restoration of a garden.

b) List and explain the considerations that influence the production of a garden restoration schedule.

c) Describe the circumstances, which may lead to the modification of the restoration schedule.

This question was generally well answered, there was some confusion over the appropriate answers for each section. The answer for each part of this question is as follows:

a)

- Fencing off unsafe items using fencing.
- Enclosing structures within a temporary structure to protect form the weather.
- Covering hard surfaces to protect from wear and tear form both vehicular and pedestrian traffic.
- Removal of structure for safe weather proof storage.
- Re routing access paths away from sensitive areas.
- Wrapping of tree trunks to avoid damage.
- Tying back of branches.
- Removal of plants where possible to nursery.
- Propagation of plants at risk.
- Protecting lawns from compaction and loss of grass.
- Frost protection.

b)

- The level existence of various landscape features, is restoration or total replacement of some features?
- The uniqueness of the landscape and its value regionally, nationally and internationally.
- State of landscape features.
- Sources of finance restoration, will the work have to be phased over a number of years.
- Restoration will be affected by the availability of grants.
- Can income be generated by garden visiting and revisiting so that the general public can observe the state of progress with restoration work.
- Marketing to encourage visitors and therefore increase income.
- The availability of experts for consultation on some specialised work.
- Safe access for the public.

c)

- The level existence of various landscape features, is restoration or total replacement of some features?
- State of landscape features.
- Sources of finance restoration, will the work have to be phased over a number of years.

- Restoration will be affected by the availability grants.
- Can income be generated by garden visiting and revisiting so that the general public can observe the state of progress with restoration work.
- Marketing to encourage visitors and therefore increase income.
- The availability of experts for consultation on some specialised work.
- Safe access for the public.

Q3 Explain the factors that influence the planning and layout of a site for an ornamental garden under **EACH** of the following headings:

vi) access;
vii) existing utility services;
viii) mature trees;
ix) soil;
x) aspect.

The aim of this question is to show that the candidate is able to analyse data gathered during the site appraisal process and appreciate how this information may impact on future development of a site in respect to its planning and layout.

Marks were awarded in each section for including explanations of the following, with examples if appropriate, with relevance to planning and layout.

i. **Access**:
Legal considerations, such as planning permission, Rights of Way, Highway Acts, sight lines etc
Safety considerations; slippery surfaces, dangerous traffic, blind spots etc
Importance – main entrance? main/first view of property
Width, height and weight restrictions, both local and distant
Desire lines
Amount and type of traffic
Disabled requirements
Security
Access within site to different areas and into buildings
Restrictions from existing structures, vegetation / trees

ii. **Existing utility services**
Often unalterable, cost in relocation
Difficulty in changing site levels – especially drains
Adequate for proposed extra input?
Inspection covers, manholes unsightly -Incorporation into plans?
Future accessibility requirements
Locations for future lighting, taps etc
Implications of overhead services – telegraph poles, inadequate headroom
Planting restrictions over services
Building restrictions over services
Safety – ie services (possibly old) accessible to children, electrical installation regulations

iii. **Mature trees**

Species, - rarity, amenity, horticultural value, focal point?
Tree preservation orders
Condition, life expectancy? Deciduous/evergreen – could influence future maintenance programme, leaf fall etc
Shade, where and when and implications
Screening, privacy requirements – blocking desirable views?
Size, scale, proportion - give structure and height to design
Height under canopy - headroom
Proximity to existing buildings
Positioning of new structures/water features
Difficulty in changing site levels / hard landscape problems within root spread
Problems planting under – light levels, nutrients, water
Removing existing tree could cause ground heave / swell

iv. **Soil**

Depth of topsoil
pH
Texture
Fertility/nutrient status - indicator plants?
Stability - signs of erosion
Drainage requirements
Stone content
Organic matter
Structure/compaction/cultivation requirements
Need to replace?

v. **Aspect**

Shade
Sun
Wind
All of the above could be explained in relation to plants, people and features – ie ponds, and how they need to be assessed to take seasonal variations into account
Microclimates, rain shadow, frost pockets, shelter
Slope
Algae/moss build up
Views in and out, overlooking, privacy

Most candidates were able to list some of the factors in each section but, as required by the question did not go into adequate detailed **explanations** or provide examples. Few candidates provided more than three or four factors in each section. In all the parts of the question the answers could have included factors which could be relevant during the construction phases and to the completed project but this point was often confused in relation to the **planning** and **layout** of the site as asked for in the question. For instance it was often correctly stated that the width of access might prevent large construction vehicles and machinery entering the site which could exclude planning major earthworks and contouring into the scheme, or the introduction of large or heavy features may not be possible. But many candidates stated that striking and damaging underground services during

construction could be dangerous but did not explain how, or if, this is relevant to the planning and layout of the garden. Likewise the potential damage to trees and necessary protection during construction was often quoted, but this would not usually reflect in the planning and layout.
Better answers included both the functional and aesthetic influences in the explanations.
Some candidates assumed the garden would be open to the public but this was not implied in the question.

Q4 a) Describe how a design of a garden is influenced by the style of the house.

b) Distinguish between traditional and contemporary garden styles, using **EACH** of the following headings:

v) statues;
vi) seats;
vii) water;
viii) screening.

The aim of this question is to show that the candidate has an understanding of basic design principles, particularly unity, and how and why different garden features are included in the creation of named garden styles.

a) This part of the question required a description as to how the principles of unity may be applied by matching the garden to the house.

Marks were awarded for including explanations of the following, with examples if appropriate:
Matching historical styles and the use of local vernacular
Use of matching (or contrasting) materials, colours, textures, shapes
Reproducing angles and lines of the house in the garden
Continuation of symmetry/asymmetry of house and extending architecture into garden – continuing flooring patterns into exterior paving, pergola beams repeating roofline etc
Echoing proportion/scale of house – similar sizes of house features used in garden
Appropriate architectural planting around house extended into garden and vice versa

Most candidates approached this question by stating that unity could be achieved by matching historical styles – ie a cottage with a cottage garden. This in itself was often somewhat vague and in this example a description of a typical cottage and the features of a cottage garden, and **how** the cottage would influence the garden, would have been required to gain a higher mark. Many answers did not go any further than the historical influences.

b) This question required particular emphasis on the **differences** between traditional and contemporary styles using descriptions and examples of features from both styles and how each might typify this style.

Marks were awarded in each section for including and comparing descriptions

using the following criteria:

i. **Statues**
Purpose – ie focal point, allegorical, show of wealth etc
Materials, finishes, colours
Siting, importance/position in design etc
Subject matter, style, formal/informal,realistic/abstract

ii. **Seats**
Purpose – ie focal point, viewing point, relaxation
Materials, finishes, colours
Siting, importance/position in design etc
Style, formal/informal
Permanence, mobility, storage/stacking
Comfort

iii. **Water**
Purpose – ie focal point, sport, reflection, cooling
Scale/proportion to size of site
Siting, importance/position in design etc
Materials – especially modern materials in contemporary gardens – liners pumps etc in relation to the style
Style, formal/informal
Wildlife
Movement, sound, lighting
Associated ornamentation

iv. **Screening**
Purpose – ie security, screening, privacy, backdrop, division, etc
Ornamental value
Siting, importance/position in design etc
Materials – plants and manmade
Style, formal/informal
Maintenance and longevity

Most candidates were able to give examples and describe relevant features in both traditional and contemporary contexts, but then did not adequately distinguish between the two – ie with reference to such concepts as (eg) minimalism, romanticism, form and function. There was confusion as to what is typical to each style. For example some candidates stated that traditional water features are all formal – ie canals, basins and cascades on a grand scale, such as at Chatsworth, whereas an equal number quoted Capability Brown type informal lakes. Neither was wrong but **both** needed to be quoted and then compared with contemporary equivalents. Confusion was also compounded by the fact that some traditional features, such as pleached trees, are also very much in vogue in contemporary gardens.

Q5 a) Describe **THREE** symptoms of bad drainage, which may be recorded during a site appraisal.

b) Draw a large, clearly labelled cross-section of a piped land drainage system for a clay soil, showing dimensions and installation details.

c) State a suitable drainage fall for this system; to describe the equipment required and how it would be used to set up, over a distance of 50m.

The aim of this question is to show that the candidate is able to recognise drainage problems during the site appraisal process, to specify an appropriate system to alleviate poorly drained areas and to describe how to set out such a system.

a) Almost all candidates who answered this question were able to describe three symptoms, with variations on the presence or signs of standing water, indicator plants, smell and gleying.

b) This part of the question required a clear **cross section** drawing showing correct specifications and layout of materials with appropriate dimensions for a clay soil. In general the actual construction details were shown accurately but in many cases vital information such as specifications of the actual pipe and associated dimensions was missing.
Some candidates drew a longitudinal section, some attempted a cut away type perspective drawing and some included plans of herringbone land drainage systems; none of which were required, wasted time and sometimes confused the answer.

c) Although virtually all candidates were able to state a suitable fall, many were steeper than necessary and none stated that the relationship to the actual slope of the ground surface needs to be considered.
Marks were awarded for the correct naming and description of appropriate equipment – ie Automatic or laser level, profile boards (sight rails), boning rods and traveller, etc. Most answers included an appropriate selection of equipment, although it was often not named correctly. Although most candidates understood the principles of how this equipment was used to set out a drainage run, in many cases it was not well described. Particularly there were confusing descriptions as to how the initial levels are set, the falls calculated over 50m, and the importance of working back from the outfall. The method of controlling a constant fall and depth within the trench was mostly well explained. Diagrams helped in answering this question and would have saved a lot of words in many cases.

Q6 a) State **THREE** areas on a construction site from which topsoil should be removed prior to any construction work taking place.

b) Describe how topsoil should be stored on site during the construction phase.

c) Review the range of equipment and machinery for contour adjustment on site and state the health and safety implications of its use.

The aim of this question is to show that the candidate has an understanding of site preparation techniques in relation to the properties of soils and how they are handled safely on a construction site using a range of techniques and equipment.

a) Marks were awarded for correctly stating three areas with descriptions if necessary for clarification. These areas included; areas to be re-graded, areas to have hard landscape or buildings erected, areas where vehicles will operate and materials are to be stored. Good answers listed distinctly different areas but in many cases the areas were too similar – where paving was to be constructed, where landscape walls were to be built, where landscape structures, such as pergolas were to be erected, really all covered the same purpose.

b) Marks were awarded for describing the following procedures and techniques:
Using the correct tools and machine(s) for the job
Maintaining segregation of subsoil and topsoil
Weed control (on existing ground and during storage)
Siting, dimensions and shapes of storage bunds
Measures to prevent water logging or excessive drying, covering?
Maintaining structure and fertility
Length of storage times
Exclusion of people/machines etc
Most candidates had a good understanding of the importance of correct handling of topsoil while a site is being landscaped. However many answers concentrated on small garden projects and included techniques which would not be feasible on larger construction sites.

c) This part of the question was divided into two parts – firstly identifying, describing and evaluating equipment and machines and, secondly, reviewing the safety features of this equipment and its safe operation.
In the first part marks were awarded for the naming of appropriate machines and equipment with brief explanations of mode of operation and comparisons as to the suitability for the tasks involved in contouring. This should have included an explanation of the advantages and disadvantages of wheeled and tracked machines, and an evaluation of types of buckets/grading blades, etc. It should be stated that barrows, spades and shovels are really only suitable for very small jobs, but may be required on larger projects for finishing off, working around services and in difficult areas. This part of the question was poorly answered in most cases, with little evidence shown of a sound understanding of the selection and working principles of earth moving

machinery.
Marks were awarded in the health and safety part of the question for including details of:
The need for risk assessment
Legal requirements and Codes of Practice
Training requirements and need for certification
Integral safety features of machines (such as guards) in place, understood and respected, safety notices and symbols on machines
Safety factors specific to earth moving and excavation – ie danger of open excavations and working near edges, angle of slope, slippery in wet conditions etc
Signage and exclusion methods
PPE
There were some good answers in this section but as few candidates were able to specify appropriate machines in the first part of the question they could not state the specific safety implications of their use. Therefore even the better answers could only refer to generic implications of the safe use of earth moving machinery and general site safety.