



Sharing the best in Gardening



**R3102**

**THE ROOT ENVIRONMENT, PLANT NUTRITION  
& GROWING SYSTEMS**

**Level 3**

**Wednesday 13 February 2013**

**13:30 – 15:00**

**Written Examination**

Candidate Number:.....

Candidate Name:.....

Centre Number/Name:.....

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

- i) The duration of this paper is **90** minutes.
- ii) **ALL** questions should be attempted.
- iii) **EACH** question carries **10 marks**.
- iv) Write your answers legibly in the spaces provided. It is **NOT** necessary that all lined space is used in answering the questions.
- v) Use **METRIC** measurements only.
- vi) Where plant names are required, they should include genus, species and where appropriate, cultivar.
- vii) Where a question requires a specific number of answers; only the first answers given that meet the question requirement will be accepted, regardless of the number of answers offered.
- viii) Please note, when the word 'distinct' is used within a question, it means that the items have different characteristics or features.

## ANSWER ALL QUESTIONS

		MARKS
Q1	a) State what is meant by 'soil profile'.	1
	.....	
	.....	
b)	Podzol is one soil type found in the United Kingdom. List <b>THREE</b> other soil types found in the UK.	3
	.....	
	.....	
c)	Describe the water holding characteristics for <b>THREE</b> of the soil types in the UK.	6
	.....	
	.....	

Please see over/.....

3

## Q2

Review the properties of a silt soils under **EACH** of the following headings:

- i) components;
- ii) structure;
- iii) chemical/mineral properties.

3

3

4

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

**MARKS**

Total Mark

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



b) State **TWO** ways in **EACH** case by which soil can be made more acid by:

- i) natural processes;
- ii) horticultural operations.

2

2

Total Mark

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

**Q4** a) List **TWO** horticultural and **TWO** environmental benefits for preserving organic matter in the soil.

4

b) Describe the biological activity that occurs during the decomposition of organic matter in the soil.

6

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



Total Mark

**Q5**

Describe **FIVE** methods to ensure that adequate nutrients are available for optimum growth of a plant grown in a container.

**10**

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



**Q6** a) i) Explain how 'conversion' is achieved in UK organic certification.

4

ii) State **TWO** reasons that a grower may decide not to convert to organic growing.

2

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

- b) i) Explain why the use of fertilisers is not encouraged by organic certification bodies.

2

- ii) State **TWO** situations in which the use of fertilisers may be permitted when growing organically.

2

Total Mark

Please turn over/.....

**Q7** a) Describe with the aid of clearly labelled diagrams **EACH** of the following soil structures:

- i) crumb;
- ii) platy.

22

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

6

- Total Mark





Total Mark

**Q9**

In the table below:

- i) List **FIVE** characteristics of peat that makes it suitable as a growing medium.
- ii) State for **EACH** characteristic an alternative material with similar properties.

5

5

	Peat Characteristics	Alternative material
1		
2		
3		
4		
5		

Total Mark

Please turn over/.....

- Q10** a) Describe how the chemical properties of a soil are affected by its mineral components.

**4**

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

- b) Define the difference between temporary and permanent wilting point.

**3**

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....



**DO NOT USE THIS PAGE**

**DO NOT USE THIS PAGE**

**DO NOT USE THIS PAGE**

**©These questions are the property of the Royal Horticultural Society.  
They must not be reproduced or sold.**

**The Royal Horticultural Society, Wisley, Woking, Surrey GU23 6QB.  
Charity Registration Number: 222879/SC038262**