



Excluding examiner comments



R3102

THE ROOT ENVIRONMENT, PLANT NUTRITION & GROWING SYSTEMS

Level 3

Wednesday 7 February 2024

13:30 – 15:10

Written Examination

Candidate Number:

Candidate Name:

Centre Name:

IMPORTANT – Please read carefully before commencing:

- i) The duration of this paper is **100** 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) Use black or blue ink only. Pencil may be used for drawing purposes only. Ensure that all diagrams are labelled accurately with the line touching the named object;
- vii) Where plant names are required, they should include genus, species and where appropriate, cultivar;
- viii) 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;
- ix) Please note, when the word 'distinct' is used within a question, it means that the items have different characteristics or features.

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Q3 a) A field has a soil moisture deficit of 63mm. State what this means.

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b) Compare the use of the following irrigation techniques

- i) overhead sprinklers
- ii) porous pipe

by completing the tables below:

Irrigation technique	Overhead sprinklers
Advantage 1	
Advantage 2	
Limitation	
Appropriate horticultural situation	

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MARKS

Irrigation technique	Porous pipe
Advantage 1	
Advantage 2	
Limitation	
Appropriate horticultural situation	

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Q4 a) Describe **ONE** role of potassium within the plant.

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b) State **TWO** symptoms of potassium deficiency.

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c) State **TWO** ways of rectifying potassium deficiency.

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d) Describe **TWO** effects on the plant of applying excess potassium.

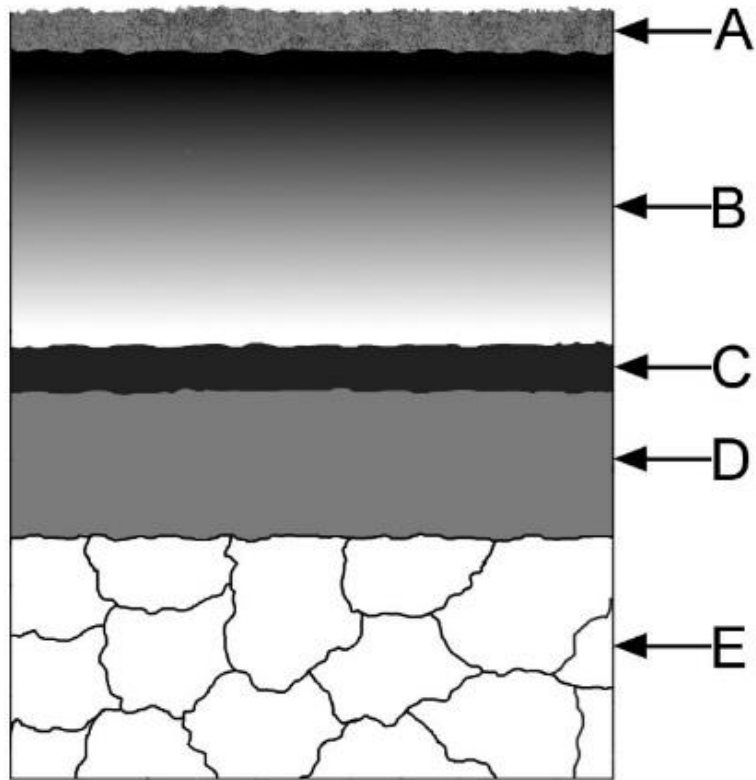
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Q6 a) Label the iron pan podzol using the diagram below.



- A.....
- B.....
- C.....
- D.....
- E.....

Please see over/.....

Q7

Summarise how the activity of bacteria in the soil is affected by **EACH** of the following:

MARKS

- i) moisture content
- ii) temperature
- iii) oxygen
- iv) pH
- v) organic matter content

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iii).....

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MARKS

iv).....

v).....

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Q8

Compare the characteristics of **EACH** of the following materials by completing the table below:

	Perlite	Composted Bark
Sterility		
Stability		
Water Holding Capacity		
pH		
Nutrient Content		

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PLEASE TURN OVER FOR NEXT QUESTION

Please turn over/.....

b) Describe **THREE** benefits of using green manures.

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