



Excluding examiner comments

## RHS Level 2 Certificate in Plant Growth and Development

### UNIT 1

Friday 10 February 2023

09:00 - 11:00

Candidate Name: .....

Candidate Number: .....

Centre Name: .....

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### Instructions

This paper contains three sections which may be answered in any order. Candidates should answer:

**Section A** – all questions (20 marks)

**Section B** – all questions (50 marks)

**Section C** – only **TWO** from **FOUR** questions (30 marks).

#### Please note:

- i) The duration of this paper is **120** minutes.
- ii) Write all answers legibly in the spaces provided and use black or blue ink only.
- iii) Use **METRIC** measurements only.
- iv) Where plant names are required, they should include genus, species and where appropriate, cultivar.
- v) Where a question requires a specific number of answers, only the first answers given will be marked regardless of the number of answers offered.
- vi) Please note, when the word '**distinct**' is used within a question, it means that the items have different characteristics or features.

Please turn over.....

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**RHS Level 2 Certificate in Plant Growth and Development - UNIT 1**

**Candidate Name:** .....

**Centre Name:** .....

**Candidate Number:** .....

**SECTION A**  
**RESPONSE GRID**

**Instructions**

Place a cross (X) in the box you believe is the correct answer. If you make a mistake, score through the box and place a cross in the correct box as follows:

	A	B	C	D
1	<del><input type="checkbox"/></del>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>





# Section A

**Answer all questions in this section.**  
**This section is worth 20 marks and each question is worth 1 mark.**

## Question 1

Which of the following site factors have **no** impact on plant establishment and growth:

- a) Drainage and water management
- b) Effects of light and shade
- c) Exposure of the site
- d) Access to the site.

## Question 2

In which of the following contexts would an organic mulch be the most appropriate means to control ephemeral weeds?

- a) Growing pot plants
- b) Annual flower borders
- c) Shrub borders
- d) Rock gardens.

## Question 3

Which of the following is a biotic factor in the pollination of fruit crops?

- a) Low temperatures
- b) Strong winds
- c) Pollinating insects
- d) Heavy rains.

please turn over.....

#### Question 4

Which **ONE** of the following shows a **correct** sequence of activities in the Nitrogen cycle?

- a) Nitrogen gas is converted by nitrifying bacteria into nitrates
- b) Decaying plant material is converted by nitrogen-fixing bacteria into nitrites
- c) Animal manure is converted into ammonia, nitrites and then nitrates
- d) Nitrogen gas is lost from the soil by lightning strikes.

#### Question 5

You are receiving an order of plants for planting out in a new border.

Which combination of the checks below should be made before signing for receipt?

Checks	Description
1	Correct number of plants
2	Details of the courier
3	Species are as ordered
4	Presence of plant pests

- a) 1, 2, 3
- b) 1, 3, 4
- c) 2, 3, 4
- d) 1, 2, 4.

#### Question 6

Is following statement correct or incorrect:

'Integrated Pest Management (IPM) means that no pesticides are used to deal with plant problems'.

Correct	Incorrect
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please see over.....

### Question 7

What type of inflorescence is shown in the photograph?



- a) Spike
- b) Corymb
- c) Cyme
- d) Panicle.

### Question 8

Which statement correctly describes an organic fertiliser:

- a) It is manufactured using the Haber Bosch process
- b) It is usually derived from plant or animal sources
- c) It has no negative environmental impact
- d) It is used as a mulch when maintaining plants.

### Question 9

Which of the following is **not** a life-cycle adaptation:

- a) Ephemeral
- b) Annual
- c) Biennial
- d) Binomial.

please turn over.....

### Question 10

Which statement indicates that a flowering plant is suffering from stress:

- a) Flower buds are found on the ground under the plant
- b) Flowers have a distinct change in flower colour
- c) Leaves have a distinct change in their shape
- d) Stems develop uncharacteristic raised lenticels.

### Question 11

Which of these plant parts is **not** involved in pollination:

- a) Pollen
- b) Anther
- c) Ovule
- d) Stigma.

### Question 12

Which statement describes the key characteristic of a **sandy** soil?

- a) It warms up slowly in the spring
- b) It cools down late in the autumn
- c) It is most likely to have a low pH
- d) It has a high level of organic matter.

### Question 13

The rule of limiting factors as applied to photosynthesis means that:

- a) The rate of photosynthesis will be limited by the factor which is in shortest supply
- b) The rate of photosynthesis will be limited according to the air temperature
- c) The rate of photosynthesis will be limited according to the leaf area of the plant
- d) The rate of photosynthesis will be limited depending on the uptake of available water.

please see over.....

#### Question 14

Which pH range makes most nutrients available to **most** plants:

- a) 3.0 - 4.5
- b) 4.5 - 6.0
- c) 6.0 - 7.5
- d) 7.5 - 9.0.

#### Question 15

Which statement best describes transpiration pull?

- a) Water moves by mass flow up the plant
- b) Water flows by cohesion and adhesion
- c) Water moves out of the leaf by capillary action
- d) Water moves in the xylem towards the leaves.

#### Question 16

Which of the following feeding regimes would be the most effective in enhancing the flowering of plants grown in containers?

- a) An all-purpose liquid feed, applied weekly
- b) A high Potassium feed, applied every 10-14 days
- c) A high Nitrogen feed, applied every 7-10 days
- d) An all-purpose organic feed, applied weekly.

please turn over.....

**Question 17**

Identify the leaf shape shown on the plant in the photograph:



- a) Simple
- b) Entire
- c) Pinnate
- d) Palmate.

**Question 18**

Which of the following bulky ingredients will most improve the drainage of a growing media:

- a) Vermiculite
- b) Perlite
- c) Loam
- d) Bracken.

please see over.....

### Question 19

A garden is advertising for seasonal staff:

**The Grange**

**Seasonal Gardeners Required**

We are looking for seasonal gardeners to join our maintenance teams

**Job details**

Saturday and Sundays  
08.00 – 16.00 hours  
Own transport required  
Would suit teenager interested in horticulture  
Attractive rates of pay

Apply in writing to The Head Gardener, The Grange Garden,

When considering equality and diversity, which statement is true.

- a) The specification of hours of work does not comply with the Equality Act 2010
- b) Limiting applicants to teenagers does not comply with the Equality Act 2010
- c) Failing to specify rates of pay does not comply with the Equality Act 2010
- d) Stating the need for own transport does not comply with the Equality Act 2010.

### Question 20

The following statements are either true or false.

#### Statement 1

A risk is a range of factors that could cause injury or illness.

#### Statement 2

A hazard is how likely an injury could be in a given situation.

Which of the combinations shown below is correct?

	Statement 1	Statement 2
a)	True	True
b)	True	False
c)	False	True
d)	False	False

please turn over.....

**End of section A. Please continue to Section B.**

## Section B

Answer all questions in this section.  
This section is worth 50 marks.

### Question 1

A plant nursery practices Integrated Pest Management (IPM). You notice some glasshouse whitefly on a batch of plants.

Place the stages of an IPM programme in order, from stage 1 to stage 7 by completing the table below.

(6 marks)

(The first one has been completed for you.)

IPM stages	Write the number in the box
Monitor pest activity	
Implement biological controls	
Scouting	1
Implement chemical controls	
Determine action and economic thresholds	
Implement cultural controls	
Identifying	

### Question 2

You recognise that some of your plants are suffering from nitrogen deficiency.

a) Describe **TWO** symptoms of nitrogen deficiency.

(2 marks)

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please turn over.....

Candidate name

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- b) Discuss how the symptoms of nitrogen deficiency stated in a) can directly impact on plant growth processes. (2 marks)

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- c) Suggest reasons why this deficiency could have occurred. (3 marks)

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### Question 3

- a) Define the following terms:

- i) Soil texture (2 marks)

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- ii) Soil structure (2 marks)

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- b) Describe how soil structure can be degraded by horticultural practices. (2 marks)

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please see over.....

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Centre name

#### Question 4

a) Name **ONE** plant example from each of the following taxonomic groups:

i) Gymnosperms (1 mark)

.....

ii) Eudicotyledons (1 mark)

.....

b) Compare the external characteristics of the two taxonomic groups named in a). (3 marks)

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c) Explain why **ONE** of the taxonomic groups named in a) might be preferred when selecting plants for environmental sustainability. (3 marks)

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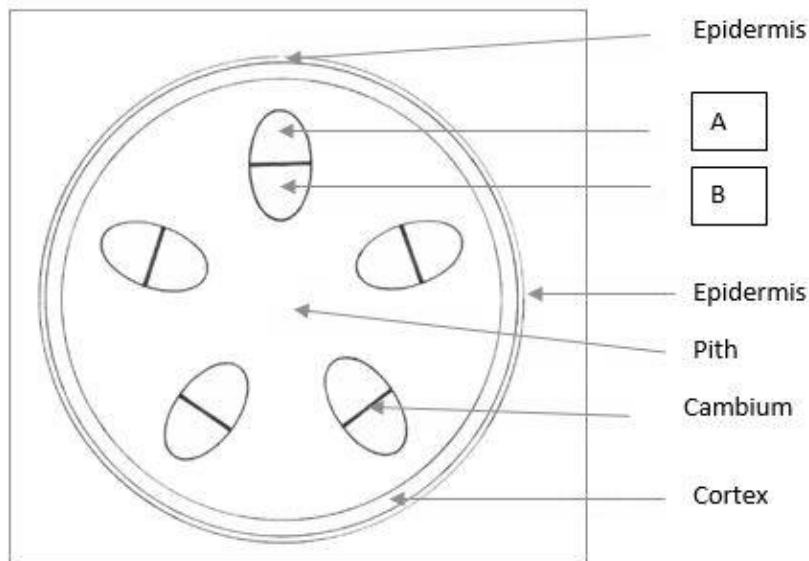
Candidate name

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### Question 5

The diagram below represents a cross-section of a young plant stem.



- a) Name the two parts labelled **A** and **B**. (2 marks)

A .....

B .....

- b) State the function of each of the two parts labelled **A** and **B**. (2 marks)

Function of A

.....  
 .....

Function of B

.....  
 .....

- c) How do you know that the diagram does not represent the stem of a monocotyledonous plant? (1 mark)

.....

Candidate name

Candidate number

please see over.....  
 Centre name

### Question 6

- a) State **TWO** reasons why water is important to plants. (2 marks)

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- b) Explain **TWO** environmental factors which increase the rate of transpiration from plants. (4 marks)

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- c) How does planting density influence the availability of water in a garden setting? (2 marks)

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please turn over.....

Candidate name

Candidate number

Centre name

**Question 7**

A domestic garden is to be created to encourage wildlife.

a) Name a suitable tree species for this situation. (1 mark)

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b) Justify the selection of the tree named in a). (2 mark)

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c) Explain how the size of the tree specified for planting can impact on sustainability. (3 marks)

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**Question 8**

A site assessment has been carried out to inform the planting of a new garden. Discuss how the findings can contribute to poor plant health and establishment, by completing the table below:

(4 marks)

<b>Finding 1: Poor drainage</b>	<b>Impact on plant health/plant establishment.</b>	<b>Named plant example (suitable for site conditions).</b>
<b>Finding 2: Exposed to full sun</b>	<b>Impact on plant health/plant establishment.</b>	<b>Named plant example (suitable for site conditions).</b>

**End of section B. Please continue overleaf to Section C**

Candidate name

Candidate number

Centre name

## Section C

There are **FOUR** questions in this Section. You must only answer **TWO** questions.

Please write your answers on the following pages. You **MUST** indicate which question you are answering by placing a cross in the appropriate box at the top of the page.

Each question is worth 15 marks. This section is worth 30 marks.

### C1

Describe the impact of climate change on plant selection. Your answer should include reference to named plant examples that are suitable for a changing climate in the UK.

(15 marks)

### C2

A parks officer has noticed that the growth of plants in a newly planted shrub border is very poor and includes leaves showing signs of chlorosis. The plants are mainly calcifuge species.

(Chlorosis is the yellowing, of the leaves of plants.

Calcifuge is a plant that is not suitable for cultivation in soils containing lime).

Using your knowledge of both plants and soil pH, describe the steps needed to test the soil and explain the likely impacts that could result from poor growth.

Discuss how amending soil pH can impact on the soil ecology.

(15 marks)

please turn over.....

Candidate name

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### C3

A garden has decided to review its maintenance plan for the establishment of new plantings.

The new maintenance plan contains the following statements:

- It is important that all maintenance is carried out efficiently, and to a good professional standard.
- Health and Safety is paramount and should underpin all actions.
- All staff are reminded that garden health plans should be consulted to ensure that maintenance activities do not pose a risk to plant health.

Using your knowledge of Best Practice, Health and Safety and Plant Health explain how these requirements might impact on the day to day work of maintaining new plantings.

(15 marks)

### C4

*'Some crops, like raspberries, apples and pears, need insect pollination to produce good yields of high-quality fruit. If pollinator populations decline... farmers would find it more difficult and expensive to produce some crops at the scale they do today.'*

*The National Pollinator Strategy for bees and other pollinators in England. Defra 2014*

Explain how flowers are designed to encourage pollination by bees, using your knowledge of flower structure. Illustrate your answer with named plant examples.

Outline the measures a horticulturist might take to optimise pollination in an orchard.

Discuss how a changing climate might impact on pollination?

(An apple orchard is defined as a collection of more than five fruit trees.)

(15 marks)

please see over.....

Candidate name

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## Section C Answer 1

## Instructions

Place a cross (X) in the box identifying the first question you are answering.

**C 1**



**C 2**

11

**C 3**

11

**C 4**

11

Candidate name

Candidate number

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## Section C Answer 2

## Instructions

Place a cross (X) in the box identifying the second question you are answering.

**C 1**

**C 2**

11

**C 3**

11

**C 4**

11

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