



RHS Level 2 Certificate in Plant Growth and Development

SAMPLE PAPER

Autumn 2022

UNIT 1

IMPORTANT – Please read carefully before commencing

- i) The duration of this paper is **120** minutes.
- ii) There are 100 marks available on this paper across three sections:
 - Section A** – Answer all 20 questions (20 marks)
 - Section B** – Answer all questions (50 marks)
 - Section C** – Answer **TWO** out of **FOUR** questions (30 marks).
- iii) Write all answers legibly in the spaces provided and use black or blue ink only.
- iv) Use **METRIC** measurements only.
- v) Where plant names are required, they should include genus, species and where appropriate, cultivar.
- vi) 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.
- vii) 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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Section A

Answer all questions in this section.

This section is worth 20 marks and each question is worth 1 mark.

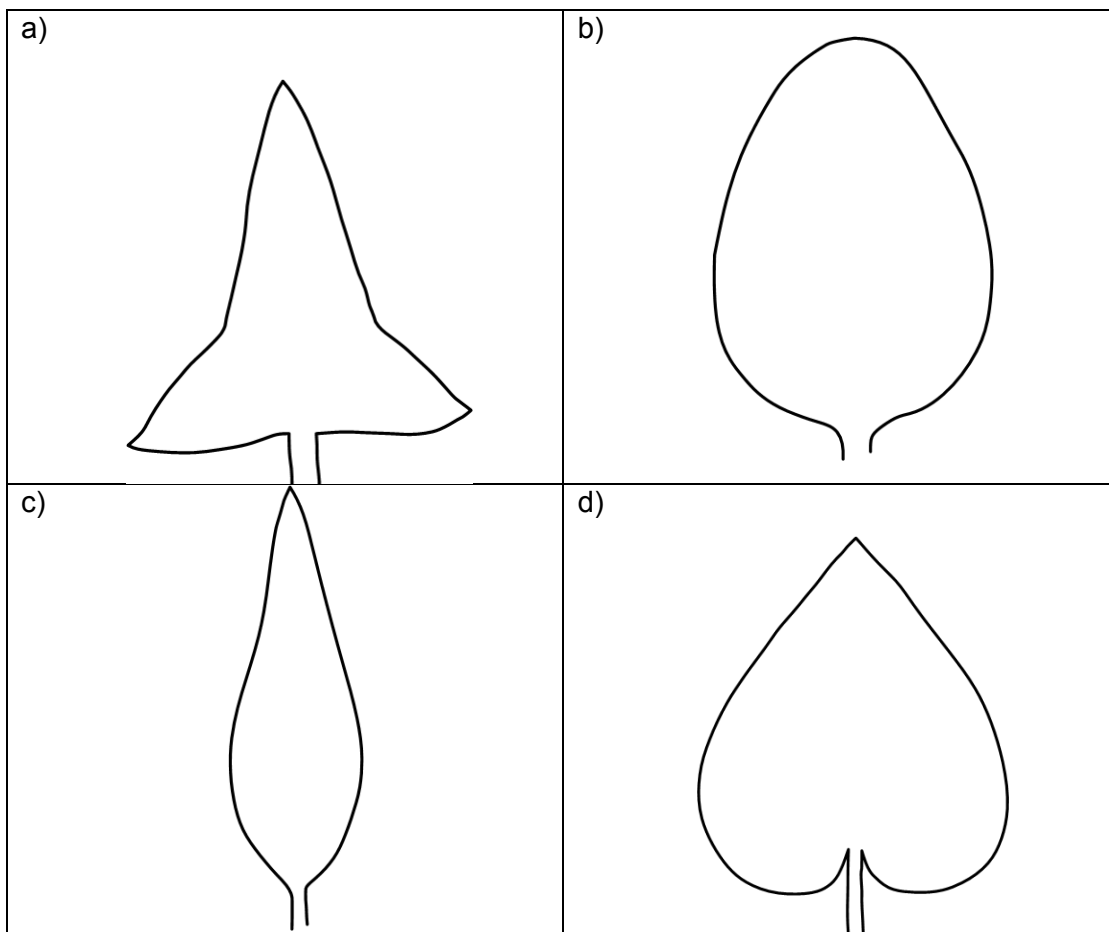
1. In the plant name *Acer palmatum*, 'Acer' is the:
 - a) genus
 - b) species
 - c) cultivar
 - d) variety

2. Which of the following botanical features are used to place plants into different families?
 - a) Seed structure
 - b) Leaf structure
 - c) Floral structure
 - d) Root structure

3. The letters PBR, when related to plant naming, refer to:
 - a) Plant Based Records
 - b) Plant Breeders' Regulations
 - c) Plant Breeders' Rights
 - d) Plant Based Regulations

4. Which **one** of the following is **not** included in a Garden Health Plan?
 - a) Irrigation method
 - b) Nutritional requirement
 - c) Maintenance programme
 - d) Season of flowering

5. Which of these leaves has a lanceolate shape?



- a)
- b)
- c)
- d)

6. Which of the following elements is a micronutrient?

- a) Boron
- b) Calcium
- c) Potassium
- d) Magnesium

7. At which pH are most plant nutrients available to the plant?

- a) pH 3.0 – 3.5
- b) pH 4.5 – 5.0
- c) pH 6.5 – 7.0
- d) pH 8.0 – 8.5

8. What is meant by the term ericaceous with regards to growing media?
- a) Suitable for the cultivation of bulbs
 - b) Suitable for the cultivation of aquatic plants
 - c) Suitable for the cultivation of houseplants
 - d) Suitable for the cultivation of lime hating plants
9. Who should produce a formal written risk assessment for the maintenance of a lawn in a large public garden?
- a) The Health & Safety Executive
 - b) Environmental Health Officer
 - c) Any employee who is competent
 - d) Any staff who work for the company
10. What do the initials IPM stand for?
- a) Independent People Management
 - b) Individual Photosynthetic Mechanisms
 - c) Internal Pathogen Monitoring
 - d) Integrated Pest Management
11. Which of the following statements applies to *Fallopia japonica* (Japanese knotweed) growing in a property:
- a) you do not legally have to remove Japanese knotweed from your land, but you could be prosecuted for causing it to spread in the wild and causing a nuisance
 - b) you must remove Japanese knotweed from your land, and you could be prosecuted for causing it to spread in the wild and causing a nuisance
 - c) you do not legally have to remove Japanese knotweed from your land, there is no legal requirement to prevent it spreading in the wild and causing a nuisance
 - d) you do not legally have to remove Japanese knotweed from your land, Japanese Knotweed is an important food source for many native butterfly species
12. Which of the plant nutrients listed promote the formation of flowers and fruits within the plant?
- a) Nitrogen
 - b) Magnesium
 - c) Phosphorous
 - d) Potassium

13. Which **one** of the following is **not** an advantage of a green manure?

- a) The green manure protects the soil structure over winter
- b) Incorporation increases organic matter content of soil
- c) The green manure can alter the texture of the soil
- d) Leguminous green manures can add nitrogen to the soil

14. Biochar can be added to growing media. Why?

- a) Improves the air and water holding capacity of the growing media
- b) Improves the stability of the growing media, preventing slumping
- c) Can be used as a replacement for peat in sustainable growing media
- d) Reduces the risk of injury when handling bulk growing media

15. The principles of sustainable horticulture and best-practice suggest avoiding the use of synthetic fertilisers when planting trees and shrubs. Why?

- a) Fertilisers add significant cost and complexity to the planting operation
- b) Fertiliser application has been shown to alter the textural class of the soil
- c) Fertilisers can negatively impact on drainage and reduce oxygen availability
- d) Fertiliser application can result in both reduced bacterial action and root growth

16. Bare root, or small container grown plants, are often specified in planting plans. Why is this the case?

- a) This reduces the carbon and water footprint of the plants
- b) This reduces the incidence of pests and diseases on site
- c) This benefits pollinators and can increase biodiversity
- d) This reduces the time from planting to flowering

17. Soil texture is defined as the arrangement of soil particles into peds, or aggregates.

Is the above statement correct or incorrect?

- a) Correct
- b) Incorrect

18. The image below shows a Plant Passport on a batch of plants.

What is the purpose of a Plant Passport?



- a) This identifies the batch of plants, so it is possible to buy further plants from this batch
- b) This identifies the batch of plants, so it is possible to track the recycling of pots and trays
- c) This identifies the batch of plants and allows them to be tracked in real time to inform delivery
- d) This identifies the batch of plants and allows them to be tracked if pests and diseases are present

19. A customer has asked for advice on the markings present on the trunks of the trees in their garden. (See image below.)



The markings are:

- a) lenticels on the trunks of trees
- b) stress fractures on the trunks of trees
- c) caterpillar pests on the trunks of trees
- d) mechanical damage on the trunks of trees

20. The image below has been taken as part of a site appraisal.

Which of the following statements describes the impact of the site conditions on the tree?

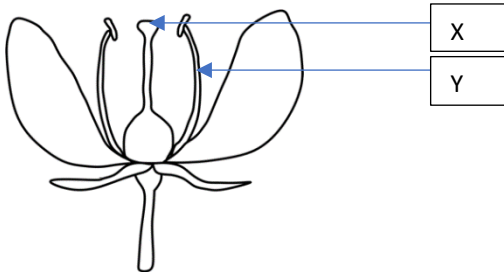


- a) Anaerobic conditions, leading to poor oxygen levels, which result in poor respiration and root death
- b) Anaerobic conditions, leading to poor carbon dioxide levels, which result in poor respiration and root death
- c) Aerobic conditions, leading to poor oxygen levels, which result in poor respiration and root death
- d) Aerobic conditions, leading to poor carbon dioxide levels, which result in poor respiration and root death.

Section B

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

1) The image below is of a typical flower.



- a) Name **one** agent of pollination suitable for this type of flower. (1 mark)
- b) What is the name and function of the part of the flower labelled 'X'? (2 marks)
- c) What is the name of the part labelled 'Y'? (1 mark)
- d) What are the advantages of cross pollination? (3 marks)
- e) Explain how plants increase the chances of cross pollination. (5 marks)
- 2) a) Name **one** piece of legislation that governs the management of weeds in the UK. (1 mark)
- b) Describe the implications of this piece of legislation within garden management. (4 marks)
- 3) a) Describe the benefits of weeds with specific reference to
- i) Biodiversity (2 marks)
 - ii) Soil structure. (2 marks)
- b) Describe the disadvantages of weeds within horticultural settings. (4 marks)

- 4) a) What do the letters AGM indicate on a plant label? (1 mark)
b) What are the advantages of specifying AGM plants? (4 marks)
- 5) a) State **one** product that can be used to replace peat in a growing media. (1 mark)
b) State **two** reasons why this product is an appropriate peat replacement. (2 marks)
- 6) Explain the primary function of the following within the plant:
- a) Phloem (2 marks)
 - b) Cambium (2 marks)
 - c) Palisade mesophyll. (2 marks)
- 7) With regards to photosynthesis:
- a) Name **TWO** inputs to the photosynthetic process (excluding light) (2 marks)
 - b) How will temperature affect the process? (2 marks)
 - c) How will wind impact on the process of photosynthesis? (2 marks)
- 8) a) Name **one** biotic process by which nitrogen is added to the soil. (1 mark)
b) Name **one** abiotic process by which nitrogen is added to the soil. (1 mark)
c) Define the term fertigation. (1 mark)
d) Explain the negative impacts of artificial or synthetic fertiliser use on the wider environment. (2 marks)

Section C

Answer **TWO** of the following **FOUR** questions in this section.

This section is worth **30** marks.

1. Explain the advantages and limitations of different staking and support systems using the following headings:
 - a) named plant examples
 - b) staking/support system
 - c) advantages and limitations
 - d) impact on plant establishment and resilience. (15 marks)

2. Explain the processes involved with the movement of water from the soil surrounding a root hair, into the root, through the plant and its release into the air surrounding the leaf. (15 marks)

3. Describe the management and control of a **named** horticultural pest in a **named** horticultural setting to include:
 - the impact of the **named** pest on plant health
 - physical, cultural and biological methods of control
 - the role of Garden Health Plans. (15 marks)

4. A series of magazine articles include the following statements:

“Every soil can be improved with the addition of organic matter and regular, thorough cultivation.”

“The practice of digging is environmentally harmful, it releases carbon and disrupts soil microbial activity”

“In modern horticulture we should practice right plant, right place. This totally removes the need to ameliorate soil.”

Explain how the above statements reflect best practice with regards to soil management.

(15 marks)



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UNIT 2

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1. The leaves of some aquatic plants contain specially adapted tissues to allow for floatation. These specialist tissues are called:
 - a) parenchyma
 - b) collenchyma
 - c) sclerenchyma
 - d) aerenchyma

2. Which of the following adaptations help the plant to reduce water loss?
 - a) raised stomata
 - b) sunken stomata
 - c) root tubers
 - d) stem tubers

3. Which of the following is a function of a waxy cuticle in a leaf?
 - a) Waxy cuticles contain carbohydrates and store food in the leaf
 - b) Waxy cuticles guide pollinating insects over the surface of the leaf
 - c) Waxy cuticles provide the plant with protection from desiccation
 - d) Waxy cuticles digest bacteria growing on the surface of the leaf

4. A dioecious plant is one which:
 - a) has male and female flowers on separate plants
 - b) has both the male and female flowers on the same plant
 - c) is a plant which only flowers during short night conditions
 - d) is a plant which only flowers during the hours of darkness

5. Recalcitrant seeds are ones that should be:
 - a) sown deeply
 - b) sown and covered
 - c) sown immediately
 - d) sown and left uncovered

6. Some plants colonise areas through the use of rhizomes.

The correct definition of a rhizome is:

 - a) a tuber which is produced on roots
 - b) a tendril which supports stems
 - c) a modified underground stem
 - d) a modified above ground root

7. Which historic garden style is shown in the image below?

- a) gardenesque
- b) picturesque
- c) modern
- d) arts and crafts



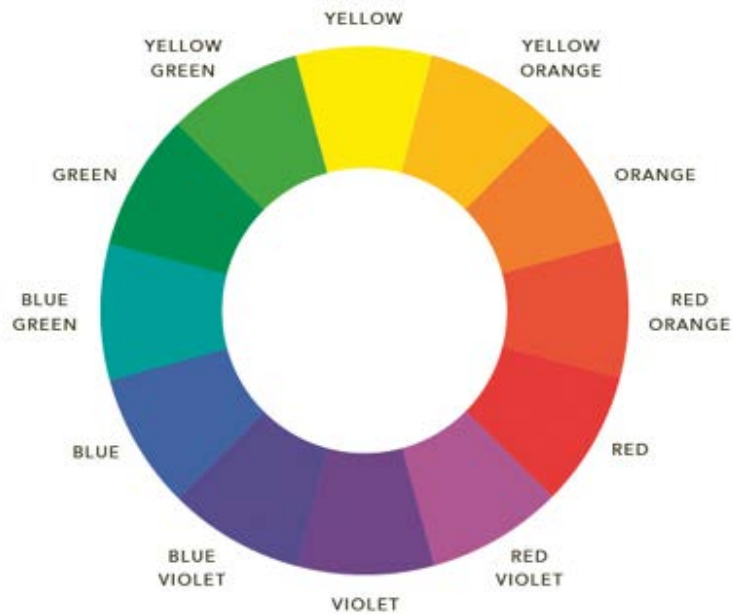
8. This planting scheme is both formal and monochromatic.



Is the above statement correct or incorrect?

- a) Correct
- b) Incorrect

9. Use the colour wheel below to name the colour that is complementary to red.



- a) Blue
- b) Yellow
- c) Purple
- d) Green

10. Which system of gardening does the following statement describe?

'A method of gardening based on Steiner's work which can incorporate certain organic, astrological and spiritual principles and practices.'

- a) Minimum cultivation
- b) Aquaculture
- c) Biodynamic
- d) Permaculture

11. Permeable paving offers the following advantages:

- a) rainwater is captured within the garden, minimising run off
- b) encourages earthworms to colonise areas by oxygen depletion
- c) is a lower cost hard landscaping solution, as no sub base is required
- d) encourages the growth of mosses and algae to create a natural surface

12. Sustainability is a major factor when selecting a new piece of horticultural equipment.

Rank the following criteria based on sustainability:

- a) corded electrical
- b) petrol powered
- c) battery electrical
- d) manual powered

Ranking	
1 st place	
2 nd place	
3 rd place	
4 th place	

Most sustainable

Least sustainable

13. By 2030 the estimated annual value of the ornamental horticulture and landscape industry to the UK economy will be:

- a) £4 billion
- b) £14 billion
- c) £42 billion
- d) £400 billion

14. The Eden Project, along with many gardens and plant producers, is a social enterprise.

Which of the following is the correct definition of a Social Enterprise?

- a) A business that follows organic principles, that is regulated by the Soil Association
- b) A business that aims to generate profit to be reinvested to create a positive social impact
- c) A business that exists to provide people who experience social exclusion with a social life
- d) A business that links community gardens to allow them to measure and enhance their social mission

15. What is the main purpose of RHS 'Britain in Bloom':

- a) To promote excellence in community gardening; build strong community spirit and pride of place
- b) To promote local authority parks, gardens and street scene teams through volunteering
- c) To promote public and botanical gardens, through their community engagement activities
- d) To promote the sale of cut flowers within florist shops and garden centres to enhance wellness

16. What is a tertiary consumer?

- a) Organisms that are at the top of the food chain
- b) Organisms that are at the bottom of the food chain
- c) Organisms that exist outside of the food chain
- d) Organisms that are entirely herbivorous

17. When selecting seeds for tree propagation, provenance refers to:

- a) the place of origin of the plant species
- b) the place of origin of the seed collected
- c) the place of origin of the propagation unit
- d) the place of origin of the seed supplier

18. The primary legislation relating to creating safe working environments is the:

- a) Employment of Women, Young Persons and Children Act 1920
- b) Environmental Safety Information Act 1988
- c) Health and Safety at Work etc. Act 1974
- d) Offices, Shops and Railway Premises Act 1963

19. Which of the following substances are **not** covered by COSHH legislation?

- a) Fungicides
- b) Vapours
- c) Dusts
- d) Asbestos

20. Which of the following statements on plant selection is **not** related to climate change?

- a) Plants should be selected based on their drought resistance
- b) Plants should be selected based on their nectar output
- c) Plants should be selected primarily on heat tolerance
- d) Plants should be tolerant of high levels of UV light

Section B

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

1. State **three** ecosystem services provided by plants. (3 marks)

2. Specify **one** plant species suitable for use as a hedge in a wildlife garden. Justify your choice of plant. (3 marks)

3. Explain what is meant by the term 'secondary thickening' of a stem. (2 marks)

4. a) Name **two** distinct root adaptations.
b) State the advantages of **each** of the root adaptations named in a) (4 marks)

5. A packet of seed contains the instruction, 'these seeds must be stratified prior to sowing'. Explain the term 'stratified'. (2 marks)

6. a) Describe **three named** plants that will associate well with regard to colour, height and form. (6 marks)
b) Explain how climate change could impact on the selection of plants named in a). (2 marks)

7 a) Explain how the planting style of a garden can impact on the development of habitat. (4 marks)

b) Describe how gardens can be developed to create habitat for species covered by Biodiversity Action Plans (BAPs).

Use **two named** examples to support your answer. (4 marks)

c) Explain, using two examples, how BAPs impact on the maintenance of gardens. (6 marks)

8 a) The judging criteria for Britain in Bloom states:

'Engagement with schools, young people or other groups.

Promotion within the immediate area through local and regional communications.

Appropriate communications and media involvement evidenced.'

Explain **five** key actions that a local Britain in Bloom group could provide to demonstrate best practice in this area. (10 marks)

b) List **four** ways that the production of tender bedding plants impacts on sustainability. (4 marks)

Section C

Answer **TWO** of the following **FOUR** questions in this section

This section is worth **30** marks.

1. A new community garden is being developed.

The garden is going to be run by a team of volunteers from the local community. The funder has stipulated that “the garden should be a place where volunteers are safe, valued and treated with respect, fairness, and dignity”.

How can the management committee ensure that these requirements are fully met?

(15 marks)

2. A new garden area is being developed within a horticultural training centre.

The aim is to create a teaching garden to allow for the study of plant adaptations and their impact on biodiversity. The garden is also to showcase sustainable gardening practices.

Suggest a range of plants to meet the requirements of the new garden. Your answer should justify your plant selections and discuss how the planting can showcase sustainable gardening practices.

(15 marks)

3. Compare the characteristics, historic style, planting palette, and the attitudes to nature and spirit of the age represented by each of the gardens illustrated.



Garden 1



Garden 2

(15 marks)

4. With reference to named examples, explain the process through which the findings of citizen science projects are disseminated and developed into horticultural best practice.

(15 marks)