

Pearson BTEC Level 3 Nationals Extended Certificate*, Foundation Diploma, Diploma*, Extended Diploma

Please check the examination details below before entering your candidate information

Candidate surname

Other names

Centre Number

Learner Registration Number

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Time 1 hour 30 minutes

**Paper
reference**

20066K

**Agriculture; Countryside Management;
Forestry and Arboriculture, Horticulture**

UNIT 2: Plant and Soil Science

****Not relevant in Forestry or Arboriculture***

You do not need any other materials.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and learner registration number.
- Answer **all** questions.
- Answer the questions in the spaces provided
– *there may be more space than you need.*

Information

- The total mark for this paper is 80.
- The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

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Answer ALL questions. Write your answers in the spaces provided.

1 Figure 1 shows a cross section of a seed.

(a) Label structures **A** and **B** in Figure 1.

(2)

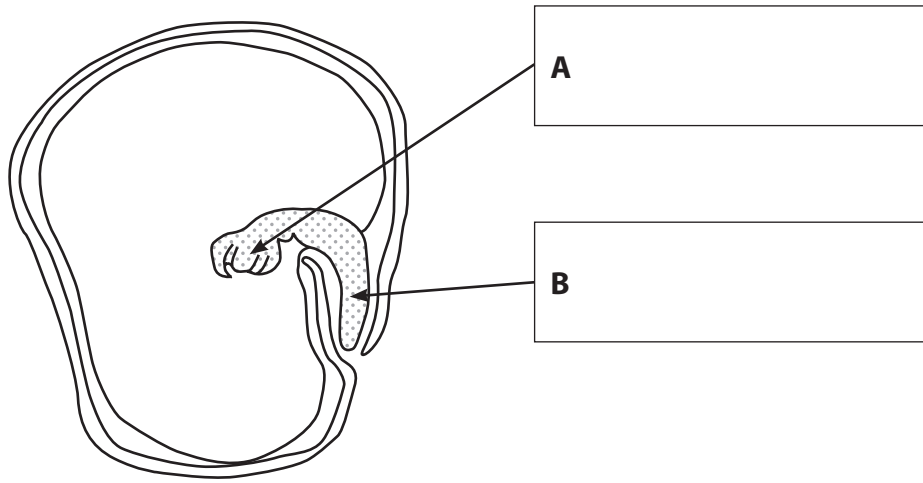


Figure 1

(b) Give **two** functions of the testa of a seed.

(2)

1

2

(c) State **two** features of a plant that uses entomophilous pollination.

(2)

1

2



(4)

(6)

(Total for Question 1 = 16 marks)



2 Figure 2 shows a diagram of a root hair.

(a) Label parts **A** and **B**.

(2)

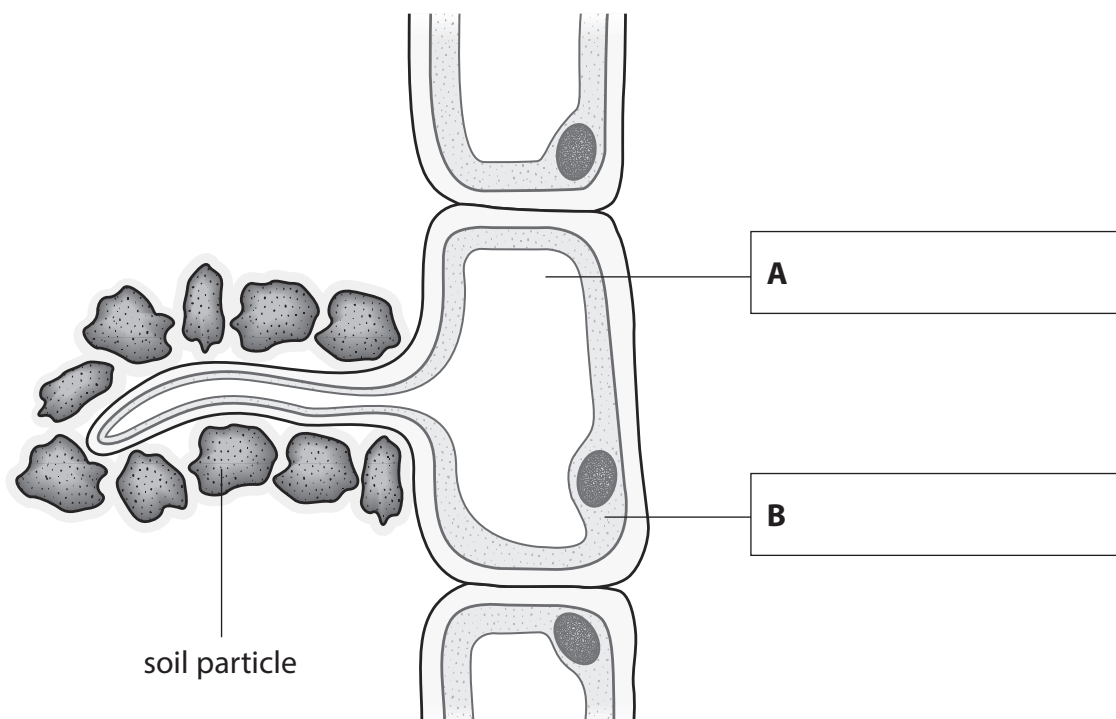


Figure 2

(b) Describe the process of water uptake in a plant root.

(4)

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(c) Explain **two** structural features of a root that allow the root to take up water and nutrients efficiently.

(4)

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(d) The weather during the spring had been wetter than average. Established plants were in waterlogged soil for two weeks.

Analyse the impact of this weather on the processes in these plants.

(6)

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(Total for Question 2 = 16 marks)



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3 A scientific article states that ‘the level of biological activity in the soil profile is the key to soil fertility’.

Discuss how biological activity impacts on the fertility of soil.

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(Total for Question 3 = 8 marks)



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4 The table shows the characteristics of two types of plant.

(a) Complete the table to include the missing information.

(2)

	Monocotyledon	Dicotyledon
Leaf vein structure	Parallel veins	
Number of flower parts		Typically multiples of 4 or 5
Number of cotyledons	One	Two
Root type	Adventitious, usually fibrous	Tap rooted, may be fibrous

(b) Explain **one** advantage for a plant during a dry season of having a tap root.

(2)

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(c) State **two** characteristics of a *Taxus* leaf.

(2)

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(4)

Describe how a neutral (pH 7) soil could be managed to provide the correct conditions to maximise production.

(6)

(Total for Question 4 = 16 marks)



5 Soil alternatives are often used for growing plants because they are more uniform in performance.

(a) Give **one other** benefit of using a soil alternative for growing plants.

(1)

The table shows the properties of three materials that may be used as alternatives to soil.

	Total porosity %	Air-filled porosity %	Water holding capacity %
Coconut coir	80	13	40
Rock wool	96	11	91
Sand	35	7	15

(b) Give **one** reason why rock wool would be best for drip irrigation systems.

(1)

(c) Describe how using drip irrigation reduces the amount of water used on crops.

(2)



(d) The table below compares some different formulations of fertilisers.

Complete the table to include the missing information.

(2)

Formulation type	Speed of action	Method of application
Granule	Medium	Fertiliser spreader
Liquid		Sprayer
Prill	Fast to medium	

(e) Explain **two** reasons why a grower would consider applying a frit fertiliser.

(4)

- 1
- 2



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(6)

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(Total for Question 5 = 16 marks)

- 6 A large field needs to be re-sown with grass and wild flowers.

Discuss the factors that will need to be considered to maximise germination and establishment of these seeds.

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(Total for Question 6 = 8 marks)

TOTAL FOR PAPER = 80 MARKS



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