

Please check the examination details below before entering your candidate information

Candidate surname

Other names

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

Centre Number

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Learner Registration Number

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Monday 11 January 2021

Afternoon (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 and 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 flower.

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

(2)

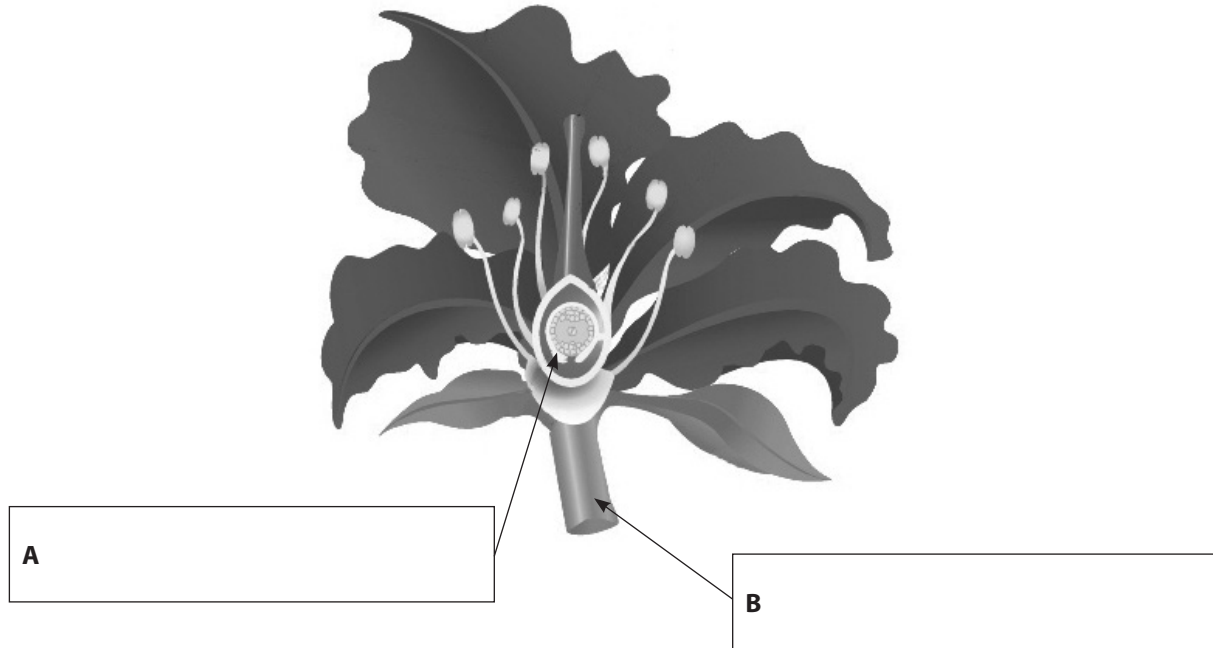


Figure 1

(b) Give **two** functions of the corolla in a flower.

(2)

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(c) State **two** ways dormancy can be caused in seeds.

(2)

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(d) Explain **two** features of an anemophilous flower.

(4)

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(e) Analyse how the climate conditions in spring improve the germination rate in many seeds.

(6)

Handwriting practice area consisting of 18 horizontal dotted lines for writing.

(Total for Question 1 = 16 marks)

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2 (a) Figure 2 shows part of the carbon cycle.

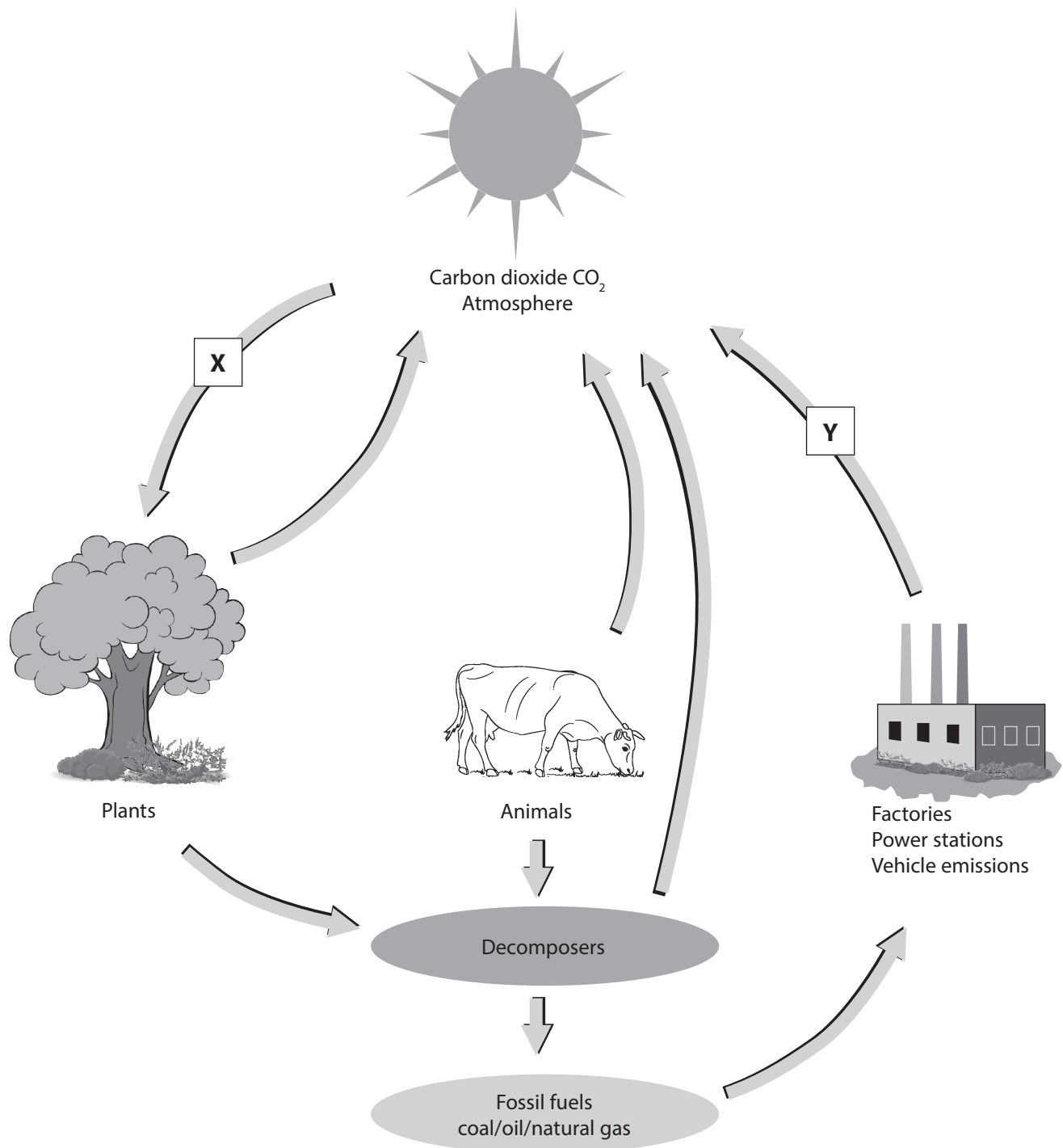


Figure 2

Identify processes **X** and **Y** in Figure 2.

(2)

X

Y

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(b) Describe the role of decomposers in the carbon cycle.

(4)

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(c) Explain **two** factors that will affect the rate of transpiration in a plant.

(4)

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(d) Discuss how different leaf characteristics affect the rate of photosynthesis in plants.

(6)

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3 Discuss the physical and chemical effects on soil formation.

Lined writing area for question 3.

(Total for Question 3 = 8 marks)

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4 The table below shows information about three methods of soil drainage.

(a) Complete the table by providing the missing information.

(2)

| | Ease of method | Permanency of method | Risk of soil erosion |
|----------------------------------|----------------|----------------------|----------------------|
| Change soil texture | Easy | | Low |
| Construct sloping ground | Difficult | High | |
| Creation of watercourses/ditches | Medium | High | Medium |

(b) State **two** methods that could be used to change soil texture.

(2)

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(c) Explain **one** way ditches and watercourses help increase the drainage of a soil.

(2)

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(d) Land-based industries often use large machinery.

Explain **two** ways that using large machinery will affect the choices of drainage system used.

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5 (a) State the meaning of the term 'organic fertiliser'.

(1)

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The table below shows information about three types of organic matter that may be used as a fertiliser.

| | Physical state | % Nitrogen | % Phosphorus |
|------------------------|----------------|------------|--------------|
| Farmyard manure | Solid | 0.70 | 0.30 |
| Leaf mulch | Solid | 0.80 | 0.35 |
| Slurry | Liquid | 0.25 | 0.15 |

(b) Give **one** reason a grower might use leaf mulch rather than the other fertilisers listed.

(1)

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(c) Describe **one** method of applying an inorganic fertiliser.

(2)

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(d) The table below records the effects and deficiency symptoms of two plant nutrients.
Complete the table by providing the missing information.

(2)

| Nutrient | Effect of nutrient | Deficiency symptoms |
|-----------------|------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| | Improved flower and fruit formation Increase in hardiness | Poor quality fruits/ seeds Leaf scorch in older leaves Leaves bronzed and rolled inwards |
| Molybdenum (Mo) | Increased uptake of nitrogen by roots. Increased root nodule activity | |

(e) A soil may contain nutrients, but a plant may not be able to take up enough of these nutrients.
Explain **two** reasons why.

(4)

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(f) Analyse the impact of organic matter on the health and fertility of a soil.

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6 A grower investigates soil alternatives.

Discuss the advantages and disadvantages of using soil alternatives for plant production.

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(Total for Question 6 = 8 marks)

TOTAL FOR PAPER = 80 MARKS

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