AQA GCSE Biology | 8461

SPECIFICATION POINT 4.3.3.2

Plant defence responses

Past-paper questions

Tier	**Foundation**
Question groups	**11**
Available paper years	**2007–2021**

Using this booklet

1. Answer the questions in order and show your working.
2. Original question numbers and marks are retained.
3. Print at actual size (100%) for measuring questions.
4. Use the companion answer booklet to check your work.

Name: _____ **Date:** _____

Whole questions are retained for context, so some parts assess other specification points. Current and legacy sources are labelled. Continue on extra paper if needed.

4.3.3.2 Plant defence responses

Question 01

June 2007 | BLY1F | Original Q1 | Legacy

1 Animals and plants are adapted in different ways in order to survive.

(a) Plants may have to compete with other plants.

(i) Name **two** things for which plants compete.

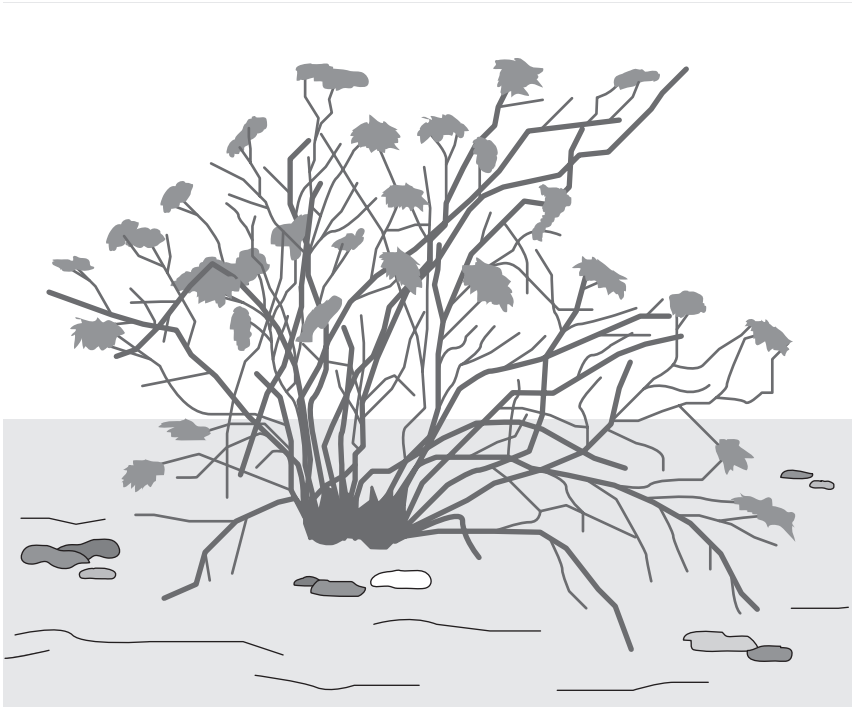
1 .....

2 .....

(2 marks)

(ii) The drawing shows a creosote bush.

This bush lives in a desert.



The creosote bush produces a poison that kills the roots of other plants.

How does this poison help the creosote bush to survive in the desert?

.....

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(1 mark)

4.3.3.2 Plant defence responses

Question 01 · continued

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(b) The photograph shows an insect called a katydid.



The katydid is preyed on by birds.

How does the appearance of the katydid help it to survive?

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(1 mark)

4

4.3.3.2 Plant defence responses

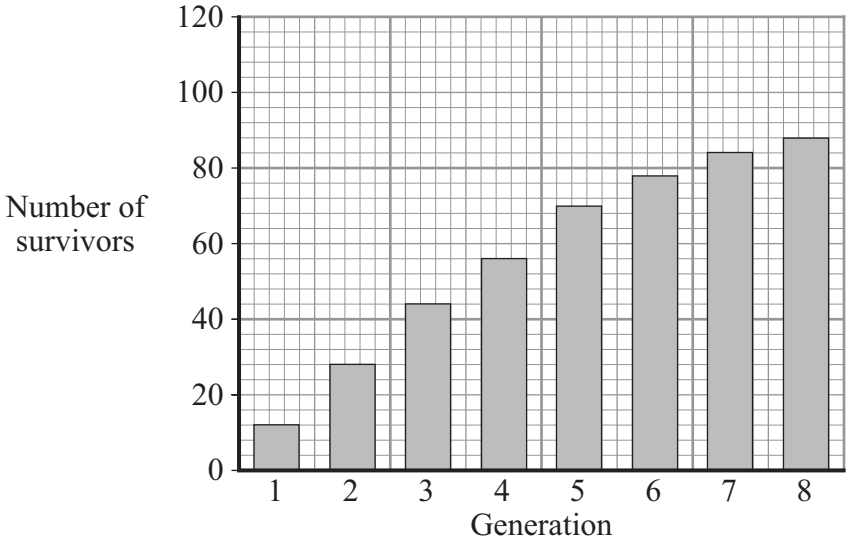
Question 02

June 2008 | BLY1BP | Original Q9 | Legacy

QUESTION NINE

Greenflies are pests that feed on plants.

In a controlled experiment, 1000 greenflies were sprayed with an insecticide. Those that survived were counted. The survivors were allowed to breed until the population reached 1000 again. These were then sprayed and the survivors counted. This was done for eight generations.



9A How many greenflies in **generation 7** survived the spraying?

1 84

2 85

3 86

4 88

9B What trend is shown by the data?

1 The number of survivors increased by the same number in each generation.

2 There was a greater increase in the number of survivors between earlier generations than between later generations.

3 There was a smaller increase in the number of survivors between earlier generations than between later generations.

4 There was no relationship between the number of survivors and the number of generations.

4.3.3.2 Plant defence responses

Question 02 · continued June 2008 | BLY1BP | Original Q9 | Legacy

9C The number of survivors increased with each generation.

What is the most likely reason for this?

1 The greenflies learn to avoid the spray.

2 The survivors had developed a resistance to the insecticide and passed on the gene.

3 More greenflies were sprayed in the later generations.

4 A more dilute insecticide was used in order to save money.

9D Which one of the following is a disadvantage of using insecticides?

1 Insecticides can be applied easily to plants.

2 Insecticides can kill the plant as well as the greenflies.

3 Insecticides can be washed into streams and rivers where they can kill other animals.

4 Insecticides save plant producers money.

END OF TEST

4.3.3.2 Plant defence responses

Question 03

March 2010 | BLY1BP | Original Q9 | Legacy

QUESTION NINE

Some plants produce poisonous chemicals for protection.

- The Bullshorn acacia does not have poisonous chemicals to defend itself.
- The Bullshorn acacia compete with poisonous acacia plants that grow in the same area.
- The Bullshorn acacia has ants living at the base of its thorns.
- The ants eat a sugary substance from the Bullshorn acacia and also eat insects that feed on the acacia.

9A The most likely reason for the presence of ants on the Bullshorn acacia is that . . .

1 the Bullshorn acacia does not have to produce poisonous substances.

2 the ants are able to find food easily.

3 the Bullshorn acacia can use the extra sugar for growth.

4 the ants reduce competition between acacia plants.

A scientist removed the ants from one plant and left another plant with its ants. He then measured the growth rate of the plants. The results are shown in the table below.

Date plants measured	**Increase in Bullshorn acacia height (cm)**	
	With ants	Without ants
May	0	0
June	29	7
July	91	14

9B What was the hypothesis being tested in this investigation?

1 The presence of ants increases the growth rate of the Bullshorn acacia.

2 The Bullshorn acacia protects ant species.

3 The ants help in the sexual reproduction of the Bullshorn acacia.

4 The Bullshorn acacia uses the carbon dioxide from the ants for photosynthesis.

9C The scientist's data might be unreliable because . . .

1 only two plants were used in the experiment.

2 there is little difference between the growth of the two plants.

3 readings were taken on only three occasions.

4 the actual height of the plants is not recorded.

9D Using all the information in this question, which row in the table suggests the best conditions for the Bullshorn acacia to grow successfully?

	Poisonous acacia	Ants
1	not present	not present
2	present	not present
3	not present	present
4	present	present

END OF TEST

4.3.3.2 Plant defence responses

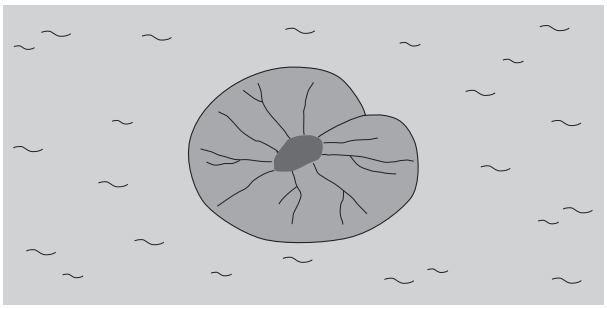
Question 04

January 2011 | BLY1F | Original Q1 | Legacy

1 Plants are adapted for survival in many different ways.

Use information from the drawings to answer each question.

1 (a) This plant lives in ponds. The leaves of the plant float on the surface of the water.



The leaf of this plant is adapted for floating on water.

Suggest how.

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(1 mark)

1 (b) This plant lives in areas where a lot of snow falls.



The triangular shape helps the tree to survive in snowy conditions.

Suggest how.

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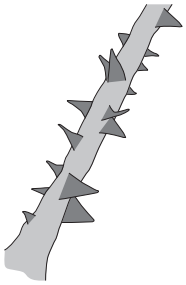
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(1 mark)

4.3.3.2 Plant defence responses

Question 04 · continued

1 (c) This plant has sharp thorns on the stem.



Thorns help this plant survive.

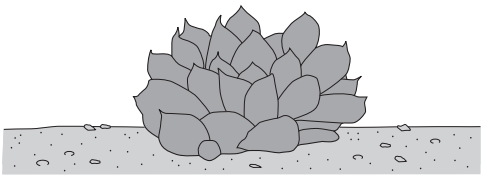
Suggest how.

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(1 mark)

1 (d) This plant lives in very dry areas.



The swollen leaves help this plant to survive in very dry places.

Suggest how.

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(1 mark)

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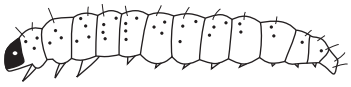
4.3.3.2 Plant defence responses

Question 05

March 2011 | BLY1BP | Original Q9 | Legacy

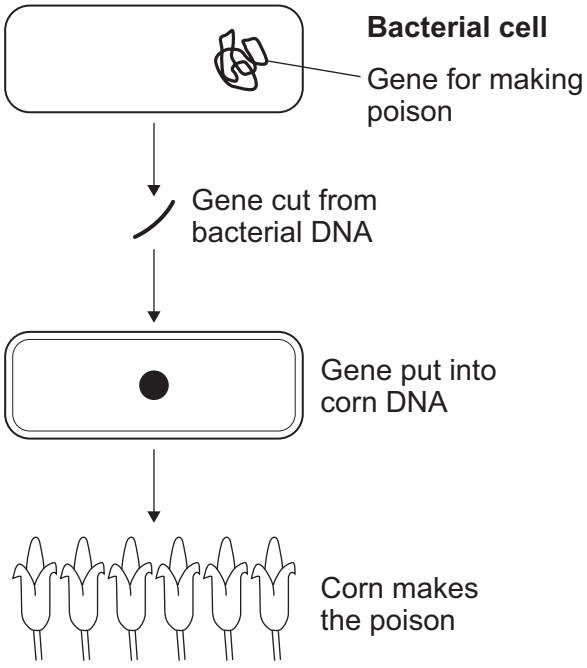
QUESTION NINE

The drawing shows a European corn borer. European corn borers eat and destroy corn stems.



It is possible to produce corn plants that produce a poison which kills the corn borer if it eats any part of the plant.

The gene for making the poison is cut from the genetic material of a bacterial cell. The gene is then inserted into the cells of a corn plant. The corn plant then produces the poison.



9A Transferring genes from one organism to another is called . . .

1 cloning.

2 evolution.

3 genetic engineering.

4 tissue culture.

4.3.3.2 Plant defence responses

Question 05 · continued

9B One economic benefit of producing this type of corn is that . . .

1 more people will want to buy this type of corn.

2 there will be fewer pests.

3 the farmer will need to use less fertiliser.

4 the farmer will produce more corn.

9C An environmental concern about growing this type of corn is that . . .

1 more chemicals will have to be used on the land.

2 it is against some people's religious beliefs.

3 the bacterial gene may get transferred to wild plant species.

4 this type of corn will be much more expensive.

9D Scientists think that this type of corn is not harmful for people to eat.

This is very difficult to prove because . . .

1 people will not volunteer to be part of a trial.

2 the human diet contains a wide variety of foods.

3 scientists are not allowed to carry out experiments on humans.

4 animals that eat this corn appear to be healthy.

END OF TEST

4.3.3.2 Plant defence responses

Question 06

June 2012 | BL1FP | Original Q6 | Legacy

6 Insecticides are chemicals which kill insects.
Insecticides may be sprayed onto crops to increase crop yield.

6 (a) Killing insects on crops increases crop yield.

Suggest why.

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(1 mark)

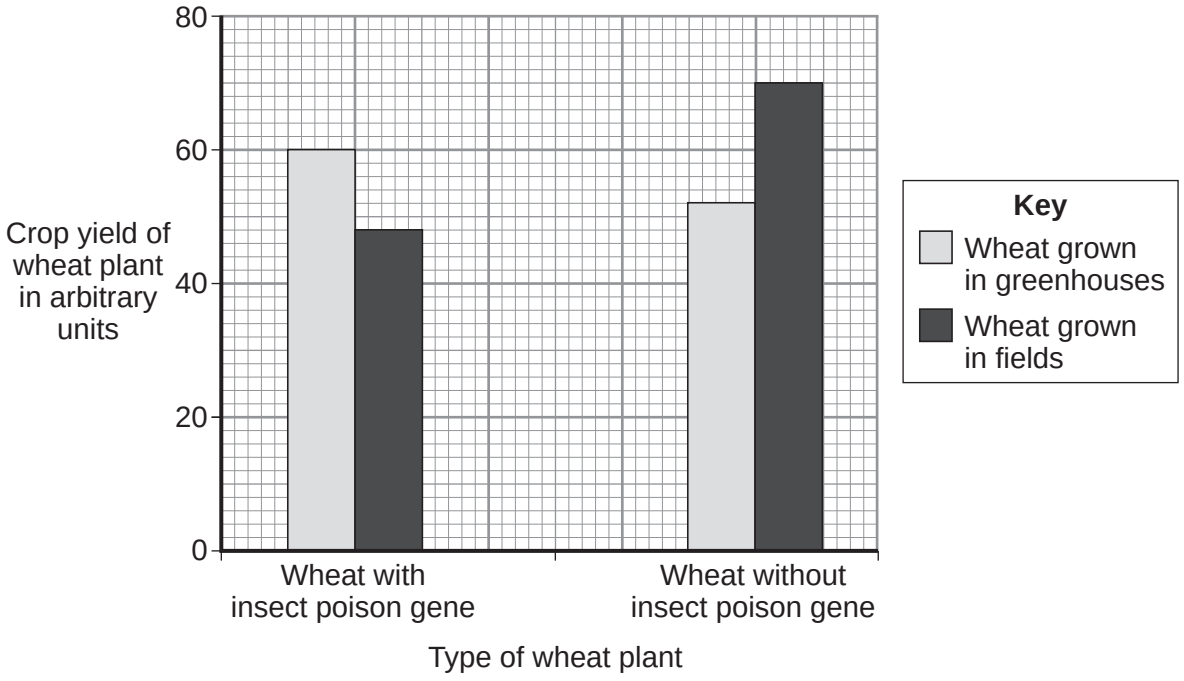
6 (b) A microorganism contains a gene which causes the production of an insect poison.

Scientists transferred the gene for production of the insect poison into wheat plants.
This makes genetically modified (GM) wheat.

The scientists:

- grew wheat plants with the insect poison gene in fields and in greenhouses
- grew wheat plants without the insect poison gene in fields and in greenhouses
- measured the crop yield of the wheat plants.

The bar chart shows the results.



6 (b) (i) What was the yield of the wheat with the insect poison gene grown in greenhouses?

..... arbitrary units
(1 mark)

4.3.3.2 Plant defence responses

Question 06 · continued

6 (b) (ii) The yield from wheat without the insect poison gene grown in greenhouses was different from the yield you gave in **(b)(i)**.

Describe this difference in yield.

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(2 marks)

6 (b) (iii) Look again at the bar chart.

What advice would you give to a farmer about the type of wheat to grow in fields?

Give a reason for your answer.

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(2 marks)

6 (c) Some people are concerned about the use of GM crops.

Why?

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(2 marks)

8

4.3.3.2 Plant defence responses

Question 07

June 2012 | BL1FP | Original Q8 | Legacy

8 *In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.*

Plants and animals have become adapted in many different ways to reduce the risk of being eaten by predators.

Describe these adaptations.

Give examples of animals and plants adapted in the ways you describe.

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(6 marks)

6

4.3.3.2 Plant defence responses

Question 08

June 2013 | BL1FP | Original Q2 | Legacy

2 Many organisms are adapted to avoid being eaten.

2 (a) The photograph shows a gecko on a leafy branch.



The gecko is adapted to avoid being eaten by predators.

Explain how.

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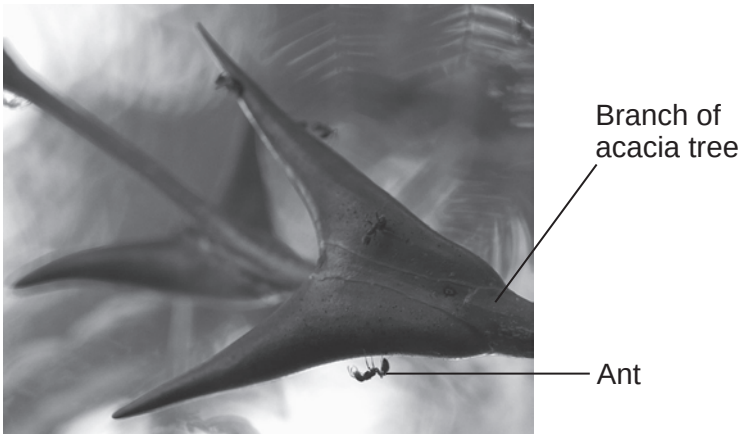
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(2 marks)

2 (b) Ants can give a painful bite.

The photograph shows a type of ant living on acacia trees.

Acacia trees have thorns on their branches.



4.3.3.2 Plant defence responses

Question 08 · continued

2 (b) (i) Predators are less likely to eat ants living on acacia trees than ants living on the ground.

Suggest why.

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(1 mark)

2 (b) (ii) Giraffes eat the leaves of acacia trees.

Giraffes do **not** eat the leaves of acacia trees that have ants living on them.

Suggest why.

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(1 mark)

2 (c) The photographs show a wasp and a hoverfly.

The wasp and the hoverfly both have black and yellow stripes.

Wasp



Hoverfly



Wasps have stings, but hoverflies do **not**.

The stripes on the hoverfly help the hoverfly to avoid being eaten by predators.

Explain why.

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(2 marks)

6

4.3.3.2 Plant defence responses

Question 09

June 2014 | BL1FP | Original Q9 | Legacy

9 **In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.**

Animals and plants have features (adaptations) that allow them to survive in the conditions in which they normally live.

Describe how animals and plants are adapted to survive in dry conditions such as deserts.

For each adaptation that you give, describe how the adaptation helps the animal or plant to survive in dry conditions.

To obtain full marks you should refer to **both** animals and plants.

[6 marks]

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Extra space .....

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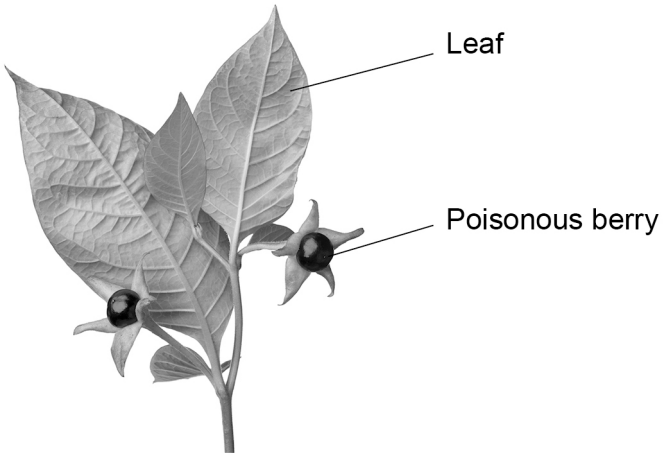
4.3.3.2 Plant defence responses

Question 10

November 2020 | 8461/1F | Original Q5

0 5 **Figure 7** shows part of a deadly nightshade plant.

Figure 7



0 5 . 1 How will the poisonous berries help the deadly nightshade plant to survive?

[1 mark]

0 5 . 2 Which type of defence mechanism are the berries?

[1 mark]

Tick (✓) **one** box.

Chemical ☐

Mechanical ☐

Physical ☐

4.3.3.2 Plant defence responses

Question 10 · continued

Figure 8 shows part of a gorse plant.

Figure 8



0 5 . 3 Suggest how the gorse plant is adapted to defend itself.

[1 mark]

0 5 . 4 The green leaves of the gorse plant make glucose for the plant to use.

What are **two** uses of glucose in the gorse plant?

[2 marks]

Tick (✓) **two** boxes.

- For defence ☐
- For respiration ☐
- To absorb water ☐
- To release minerals ☐
- To store as starch ☐

4.3.3.2 Plant defence responses

Question 10 · continued

0 5 . 5 A student wanted to show that the leaves of a gorse plant contain glucose.

The student crushed the leaves to extract the liquid from the cells.

Describe the method the student could use to test the liquid from the cells for glucose.

Include the result if glucose is present.

[3 marks]

0 5 . 6 The roots of the gorse plant have bacteria that turn nitrogen gas into nitrate ions.

Explain why nitrate ions are needed by the gorse plant.

[2 marks]

0 5 . 7 The roots of gorse plants can be infected by honey fungus.

The honey fungus produces tiny spores underground.

Suggest how the honey fungus spores travel from the roots of an infected gorse plant to the roots of a healthy gorse plant.

[1 mark]

4.3.3.2 Plant defence responses

Question 10 · continued

A drug can be extracted from gorse seeds.

Doctors want to trial the drug from gorse seeds to see if it can treat diarrhoea.

0 5 . 8 Which **two** factors must the doctors test the drug for in the trial?

[2 marks]

Tick (✓) **two** boxes.

- Appearance ☐
- Dosage ☐
- Solubility ☐
- Taste ☐
- Toxicity ☐

0 5 . 9 In the trial some patients will take tablets made from gorse seeds and some patients will take tablets made from sugar.

What are the tablets made from sugar called?

[1 mark]

Tick (✓) **one** box.

- Antibiotics ☐
- Antibodies ☐
- Painkillers ☐
- Placebos ☐

14

4.3.3.2 Plant defence responses

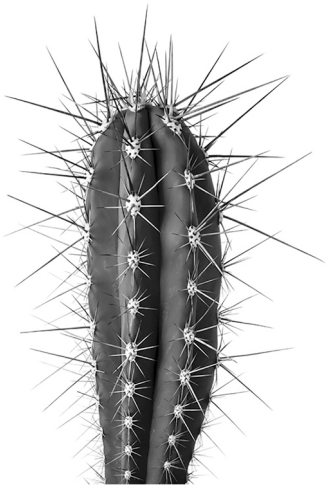
Question 11

November 2021 | 8461/1F | Original Q3

0 3 A cactus is a plant that lives in a dry environment.

Figure 6 shows part of a cactus plant.

Figure 6



0 3 . 1 Give **one** adaptation shown in **Figure 6** that helps to prevent the cactus from being eaten by animals.

[1 mark]

0 3 . 2 A plant may produce poisons that make animals unwell.

What is this type of defence mechanism?

[1 mark]

Tick (✓) **one** box.

Chemical ☐

Mechanical ☐

Physical ☐

4.3.3.2 Plant defence responses

Question 11 · continued

0 3 . 3 Some desert plants only grow leaves after it has rained.

As soon as the soil dries out, the leaves fall off.

How could the leaves falling off the plant be an advantage to a plant that lives in a dry environment?

[1 mark]

Tick (✓) **one** box.

The plant is less likely to reproduce. ☐

The plant will not lose as much water. ☐

The plant will photosynthesise faster. ☐

The stem of a cactus is green.

0 3 . 4 What causes the green colour in the stem?

[1 mark]

0 3 . 5 What is the advantage to the cactus of having a green stem?

[1 mark]

Question 3 continues on the next page

4.3.3.2 Plant defence responses

Question 11 · continued

The stem of a cactus contains many different tissues.

0 3 . 6 What name is given to a group of tissues working together?

[1 mark]

Tick (✓) **one** box.

Organ ☐

Organism ☐

Organ system ☐

0 3 . 7 Name **one** substance transported through the xylem in the stem of the cactus.

[1 mark]

_____

0 3 . 8 Name the tissue that transports dissolved sugars through the stem of the cactus.

[1 mark]

_____

8