AQA GCSE BIOLOGY (HIGHER) · 8461

BIOLOGY



EXAM QUESTION PACK

4.2.3 PLANT TISSUES, ORGANS AND SYSTEMS (PACK 2)

SCORE	PERCENTAGE
/103	%

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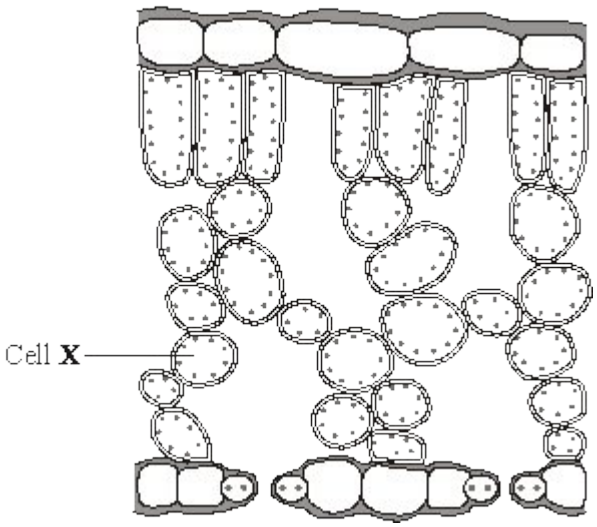
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Q1.

(a) The diagram shows a section through a plant leaf.
Water evaporates from cell **X**.



(i) **On the diagram**, draw an arrow to show how water vapour from cell **X** gets out of the leaf.

(1)

(ii) Name the process by which water vapour is lost from a leaf.

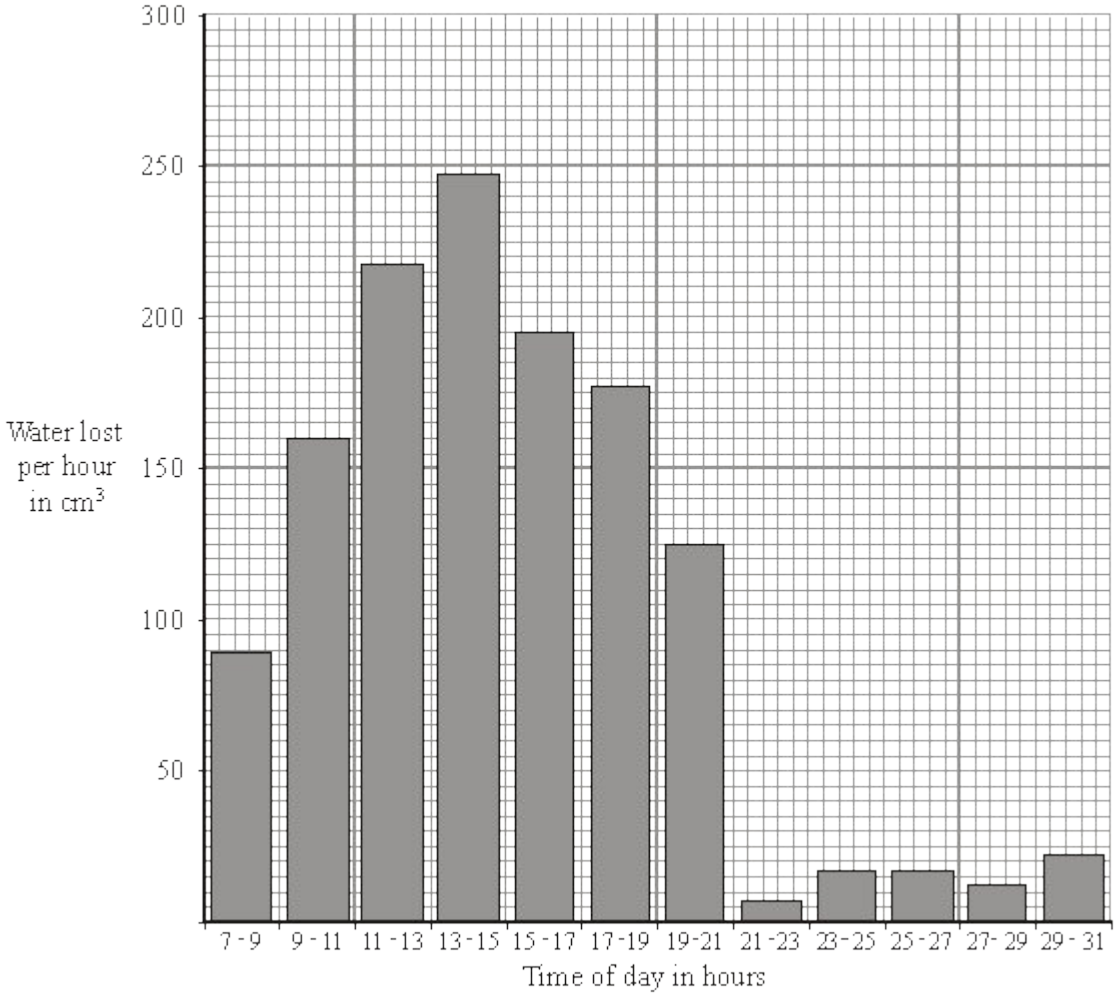
Draw a circle around **one** answer.

osmosis **transpiration** **wilting**

(1)

(b) The graph shows how much water was lost from a plant at different times of the day.

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(i) During which 2-hour period was water lost most quickly?

_____

(1)

(ii) Give **one** possible explanation why water was lost most quickly at this time.

_____

_____

_____

_____

(2)

(Total 5 marks)

Q2.

A group of students looked at stomata on four different species of plants, **A, B, C** and **D**. They estimated the number of stomata per cm^2 on the upper and lower surfaces of the leaves of the four species.

Their results are shown in the table.

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Plant species	Estimated number of stomata per cm^2 of leaf surface	
	Upper surface of leaf	Lower surface of leaf
A	4000	28 000
B	0	800
C	8500	15 000
D	8000	26 000

(a) Which plant species probably lives in a dry region?

Explain the reason for your answer.

_____

_____

_____

_____

_____

_____

(3)

(b) All four species have more stomata on the lower surface of their leaves than on the upper surface.

Suggest how this could help the plants to survive better.

_____

_____

_____

_____

(2)

(Total 5 marks)

Q3.

Four leaves were removed from the same plant. Petroleum jelly (a waterproofing agent) was spread onto some of the leaves, as follows:

Leaf **A**: on both surfaces
Leaf **B**: on the lower surface only
Leaf **C**: on the upper surface only
Leaf **D**: none applied

Each leaf was then placed in a separate beaker, as shown in diagram **1**.

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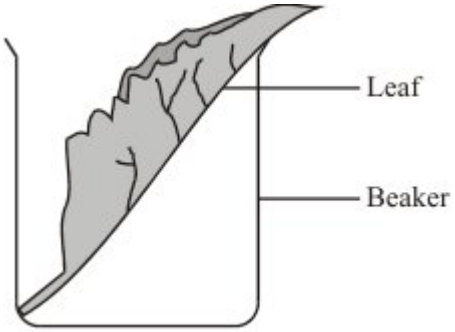
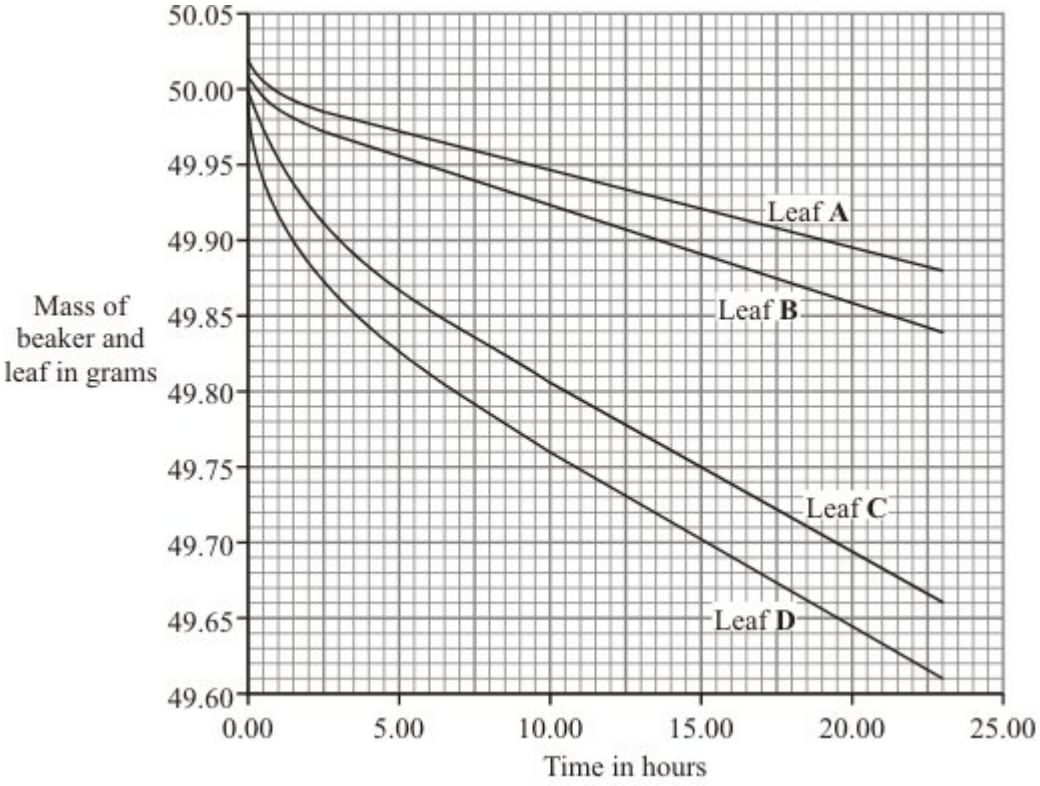


Diagram 1

Each beaker was weighed at intervals. The results are shown in the graph.



(a) Give evidence from the graph in answering the following questions.

(i) Which surface (upper or lower) loses water most rapidly? _____

Evidence _____

_____

(1)

(ii) Is water lost from both surfaces of the leaf? _____

Evidence _____

_____

(1)

(b) Diagram **2** shows the appearance of each surface of the leaf as seen through a microscope.

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Upper Surface of Leaf **Lower Surface of Leaf**

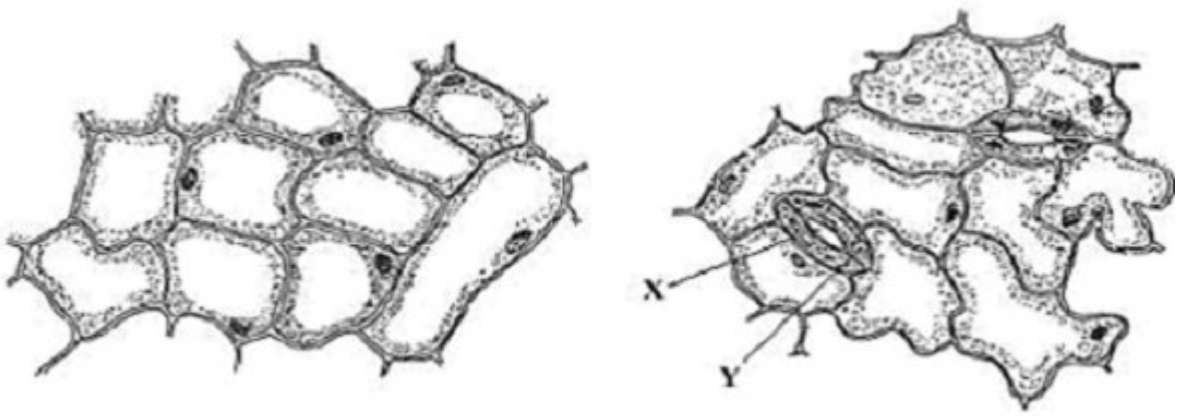


Diagram 2

(i) Name space **X** and cell **Y**.

X _____

Y _____

(2)

(ii) Use information in diagram **2** to explain why the results are different for leaves **B** and **C**.

_____

_____

_____

_____

(2)

(Total 6 marks)

Q4.

The table gives information about a geranium plant and a cactus plant.

The geranium grows in gardens in the UK. The cactus grows in hot deserts.

Feature	Geranium	Cactus
Thickness of waxy cuticle in micrometres	5	15
Total leaf surface area in cm^2	1800	150
Percentage of water storage tissue in stem	50	85
Number of stomata per mm^2	59	13
Time of day when stomata open	daylight	at night

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Horizontal spread of roots in metres	0.2	5

Using only information in the table, explain how the cactus is better adapted for living in hot, dry conditions.

To gain full marks in this question you should write your ideas in good English. Put them into a sensible order and use the correct scientific words.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

(Total 5 marks)

Q5.

(a) Complete the following sentences.

Green plants produce their own food by a process called photosynthesis. In this process the raw materials are _____ and carbon dioxide. Glucose and _____ are produced. _____ energy is absorbed by the green substance called _____ .

(4)

(b) Name **two** things that can happen in the plant to the glucose produced in photosynthesis.

1. _____

2. _____

(2)

(c) Plants need mineral salts.

(i) Through which part do mineral salts get into the plant?

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_____

(1)

(ii) Explain why water is important in this process.

_____

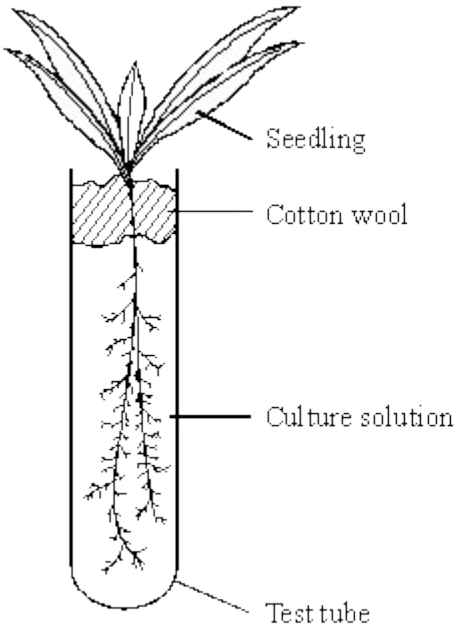
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_____

_____

(2)

Some students set up water cultures to find out how plants use nitrates.
They had two sets of nutrient solutions.
A full solution provided the plant with all the required nutrients.
The results table shows the average mass of the seedlings after 28 days of growth.



Culture solution	Average mass of seedling in g
distilled water	0.14
full solution with no nitrates	0.29
full solution	0.43

(d) (i) Give a conclusion you could make from these results.

_____

_____

(1)

(ii) Calculate the difference in average mass caused by the addition of nitrates to the culture solution.

_____

(1)

(iii) What are nitrates used for in the seedling?

_____

(1)

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(iv) Some factors need to be controlled to keep this test fair. Name **two** of them.

1. _____

2. _____

(2)

(v) Suggest **one** way you could improve the experiment.

_____

(1)

(Total 15 marks)

Q6.

(a) What type of blood vessels join arteries to veins?

_____

(1)

(b) How are oxygen and carbon dioxide carried in the blood?

_____

_____

_____

_____

(2)

(c) List **three** things that are carried around the body in the blood plasma.

1. _____

2. _____

3. _____

(3)

(Total 6 marks)

Q7.

(a) Photosynthesis is a process that takes place in green plants.

(i) What type of energy is needed for this process?

_____

(1)

(ii) What substance in the plant absorbs this energy?

_____

(1)

(iii) In which part of the plant cell does photosynthesis take place?

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_____

(1)

(iv) Write a balanced chemical equation for photosynthesis.

_____ → _____

(3)

(b) Describe **two** ways you could speed up photosynthesis.

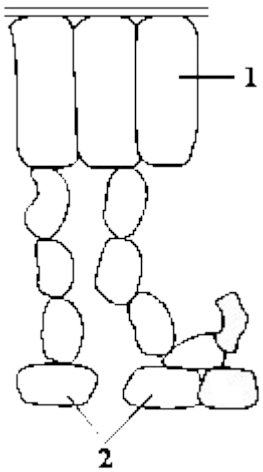
_____

_____

_____

(2)

(c) The diagram shows the outline of a cross-section of a leaf. Name cells **1** and **2** and describe how they are involved in photosynthesis.



_____

_____

_____

_____

_____

_____

_____

_____

(4)

(Total 12 marks)

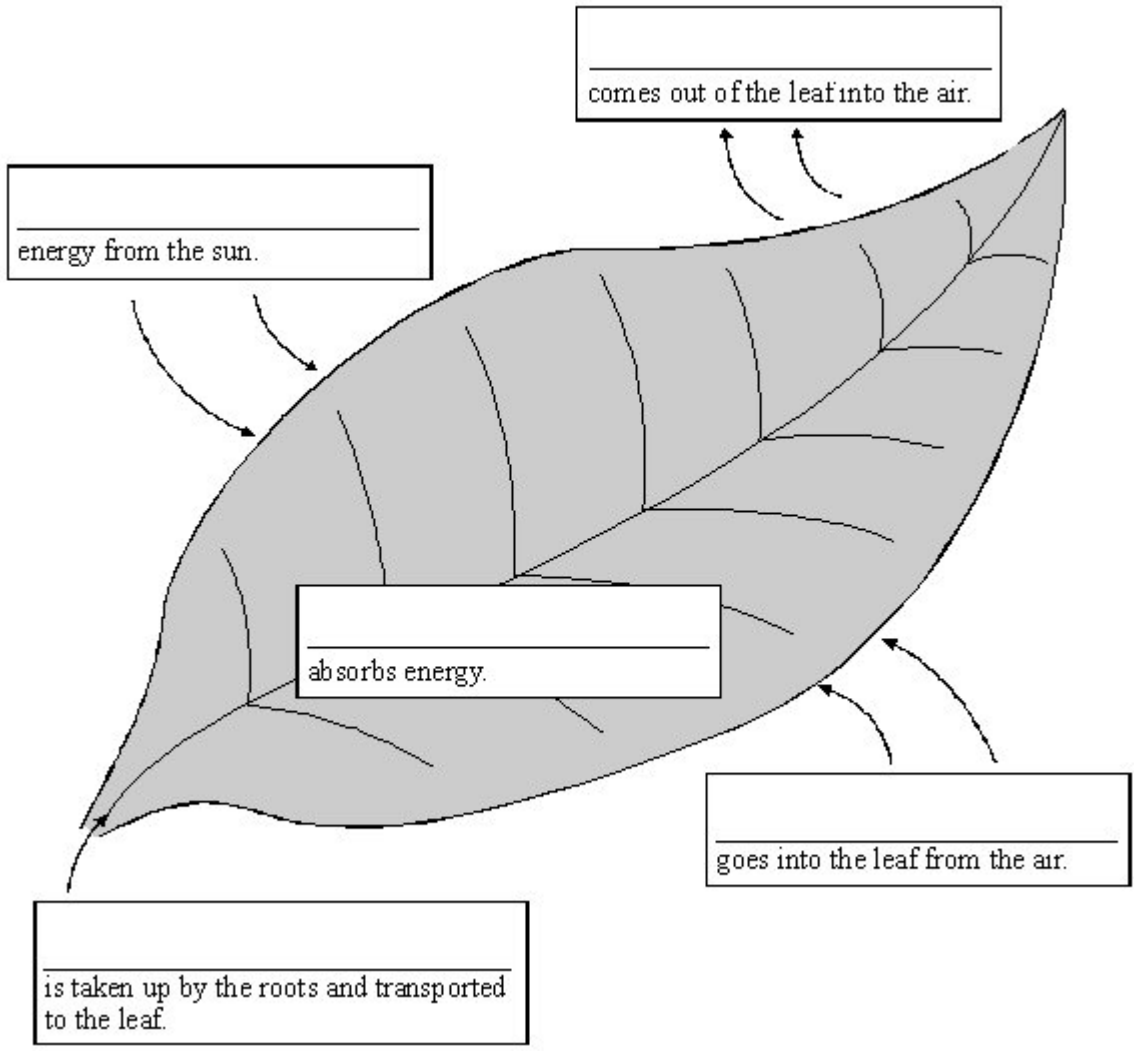
Q8.

The diagram shows how a leaf of a green plant makes glucose.

(a) Use words from the box to complete the labels on the diagram. You may use each word once or not at all.

carbon dioxide	chlorophyll	glucose	heat
light	oxygen	water	

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(5)

(b) (i) Compete the following sentence.

Glucose in food is a type of _____ . When we eat it, it gives us energy.

(1)

(ii) The plant turns some of the glucose into starch. Why is starch useful to the plant?

_____

_____

(1)

(iii) What does the plant do with the rest of the glucose?

_____

(1)

(c) (i) What is the name of the process outlined in the diagram?

_____

(1)

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(ii) Give **one** way that leaves are adapted to do this process.

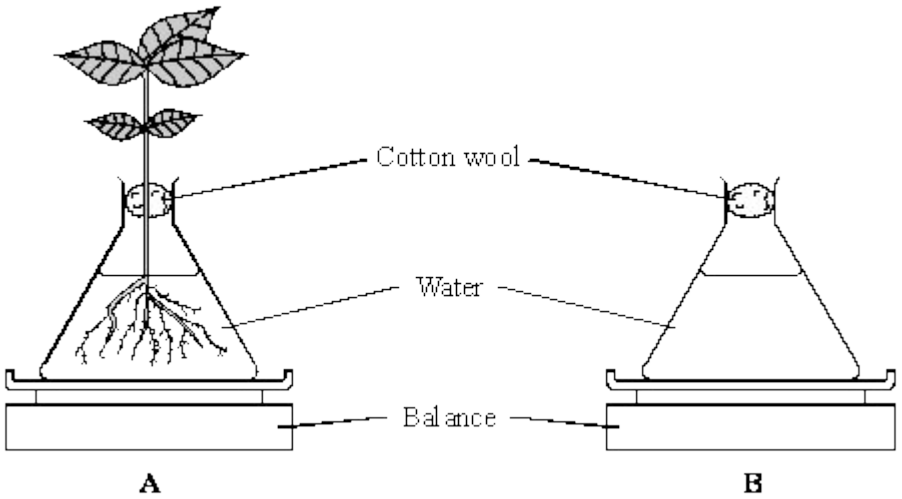
_____

(1)

(Total 10 marks)

Q9.

Some students set up the following apparatus.



The balances show the same mass at the start of the investigation.

After 24 hours the mass of flask **B** was the same but the mass of flask **A** had changed.

(i) Describe and explain the change to the mass of flask **A**.

_____

_____

_____

_____

_____

(3)

(ii) Why did the students need to set up flask **B**?

_____

_____

(1)

(Total 4 marks)

Q10.

(a) Put a tick (✓) in the correct boxes in the table below to show which of the parts given are present in the cells and organisms listed.

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	CYTOPLASM	NUCLEUS	CELL WALL	GENES
Leaf mesophyll cell				
Sperm				

(2)

(b) (i) What is the main job of a leaf mesophyll cell?

_____

_____

(1)

(ii) Explain **one** way in which the structure of the leaf mesophyll cell helps it to carry out its job.

_____

_____

_____

_____

(2)

(Total 5 marks)

Q11.

A market gardener produces large numbers of attractive, large flowered geranium plants.



(a) Give two advantages to the gardener of producing geraniums from cuttings rather than from seeds.

1. _____

_____

2. _____

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_____

(2)

(b) Gardeners often cover trays of cuttings with large polythene bags.

Suggest **one** advantage of this.

_____

_____

(1)

(Total 3 marks)

Q12.

Busy lizzie plants produce flowers with many different colours.



A gardener wants to produce busy lizzie plants to fill a flower bed in her garden.
She decides to grow them from cuttings rather than seeds.

(a) Give **one** condition that she should supply to the new cuttings so that they grow well.

_____

(1)

Busy Lizzie plants can produce flowers which are white, pink or red.
A gardener wants to grow a display containing all three colours of flowers.

(b) Give **one** advantage and **one** disadvantage to the gardener of growing Busy Lizzie plants from cuttings rather than seeds.

Advantage _____

Disadvantage _____

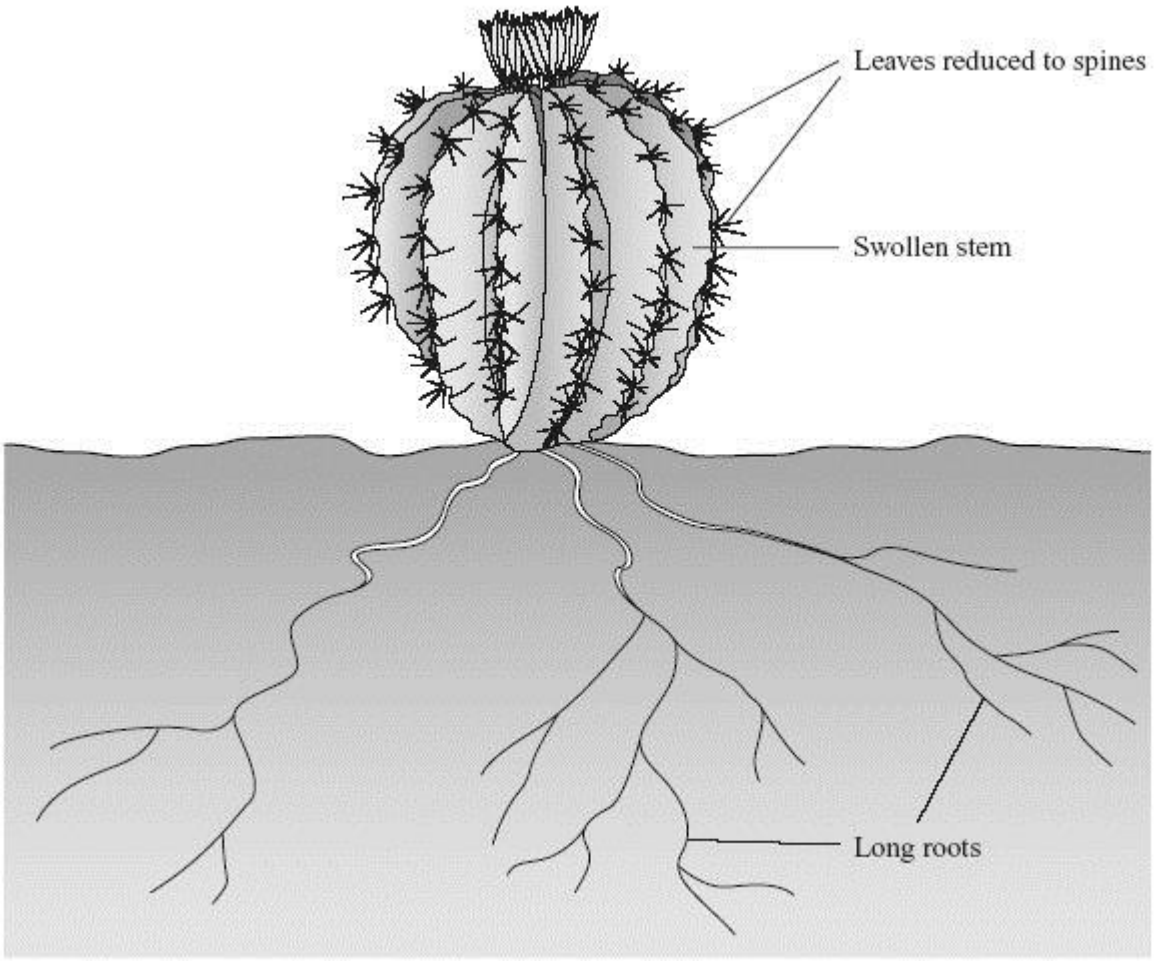
(2)

(Total 3 marks)

Q13.

The drawing shows a plant that is adapted to life in a hot, dry desert.

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(a) Which labelled part of the plant helps it to get the water it needs?

_____

_____

(1)

(b) The stem of the plant is covered by wax.
How does this help the plant to survive?

_____

_____

(1)
(Total 2 marks)

Q14.

(a) Balance the following equation for photosynthesis.

_____ CO_2 + _____ H_2O → $C_6H_{12}O_6$ + _____ O_2

(1)

(b) Give **two** conditions necessary for photosynthesis apart from a suitable temperature range and the availability of water and carbon dioxide.

1. _____

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2. _____

(2)

(a) Plants have leaves which contain guard cells and palisade cells. Explain how **each** of these kinds of cell assists photosynthesis.

Guard cells _____

_____

_____

_____

(2)

Palisade cells _____

_____

_____

_____

(2)

(d) Glucose is a product of photosynthesis. Give **three** uses which green plants make of glucose.

1. _____

2. _____

3. _____

(3)

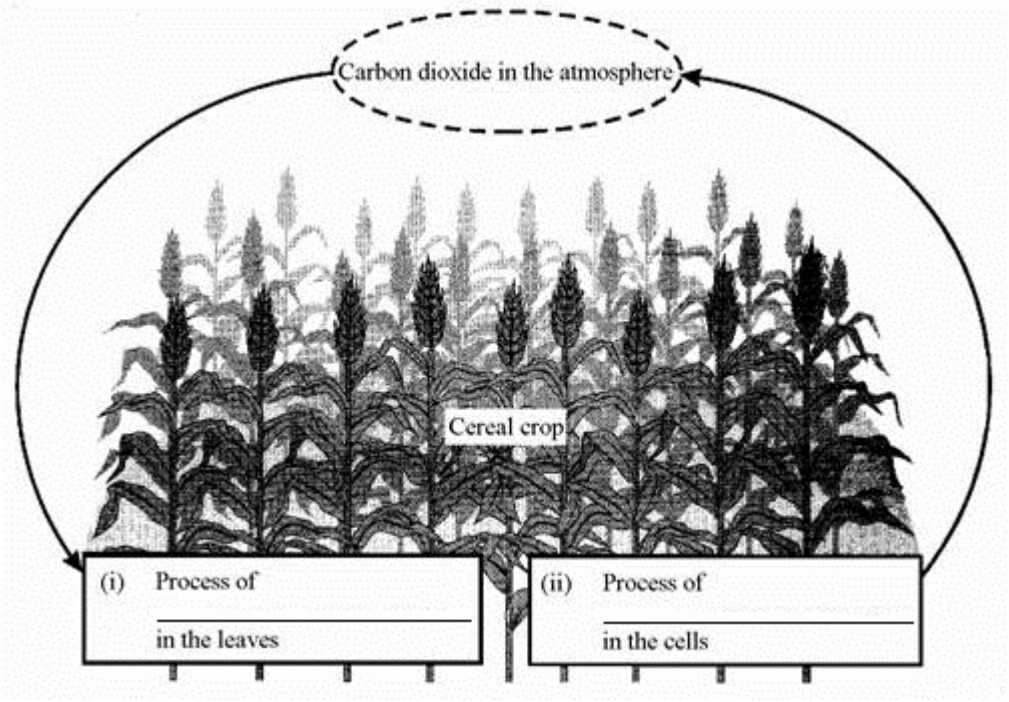
(Total 10 marks)

Q15.

(a) The diagram shows a cereal crop.

Complete spaces (i) and (ii).

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(2)

(iii) What sort of weather may cause the cereal crop to wilt?

_____

(1)

(b) Describe the process of transpiration in plants.

_____

_____

_____

_____

_____

_____

(3)

(Total 6 marks)

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