

Past-paper walk-through

Leaf structure ■ 6.2

eXercise

Questions in this set

- 0610/21 N25 Q9 ■ 1 mark
- 0610/21 J25 Q8 ■ 1 mark
- 0610/22 J25 Q10 ■ 1 mark
- 0610/23 J25 Q9 ■ 1 mark
- 0610/22 M25 Q11 ■ 1 mark
- 0610/42 M25 Q5 ■ 12 marks

Reading the mark scheme

- **B1** a mark that stands on its own – the point is either made or not.
- **M1** a *method* mark: the right approach, even if the number is wrong.
- **A1** an *answer* mark, and it usually needs its M mark first.
- **C1** a working mark on the way to the answer.
- **//** separates answers the examiner accepts equally.
- **ecf** = error carried forward: a later part is marked on your own earlier answer.
- **owtte** = “or words to that effect” – the wording need not match.

Question 9

0610/21 N25 ■ Q9 ■ 1 mark

- 9** A student wrote some statements about the palisade mesophyll and spongy mesophyll tissues.
- 1 The spongy mesophyll tissue is near the stomata for gas exchange.
 - 2 Only palisade mesophyll cells have chloroplasts for photosynthesis.
 - 3 Palisade cells are closely packed but there are air spaces in the spongy mesophyll tissue.

Which statements are correct descriptions of the two tissues?

- A** 1, 2 and 3 **B** 1 and 2 only **C** 1 and 3 only **D** 2 and 3 only

Solution 9

Answer: **C**

Why

- Spongy mesophyll lies next to the stomata, with air spaces for gas exchange – statement 1 is right.
- *Both* tissues contain chloroplasts, so “only palisade” is wrong.
- Palisade cells simply have more of them, because they receive the light first.

Question 8

0610/21 J25 ■ Q8 ■ 1 mark

8 Which descriptions of adaptations for photosynthesis are correct for spongy mesophyll tissue?

	air spaces for efficient gas exchange	long, rectangular cells to absorb light
A	yes	yes
B	yes	no
C	no	yes
D	no	no

Solution 8

Answer: **B**

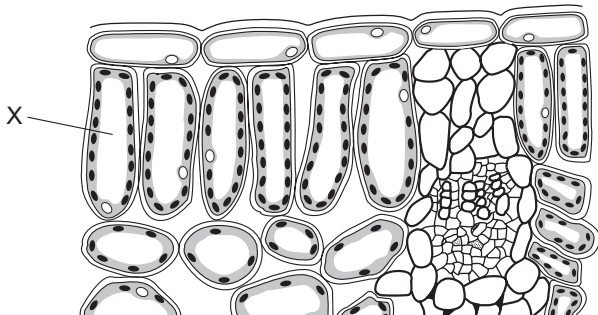
Why

- Spongy mesophyll has large air spaces, which let gases diffuse to and from the cells.
- But it is the *palisade* cells that are long and rectangular, packed at the top to absorb light.
- So the air spaces belong to spongy mesophyll and the light-absorbing shape does not.

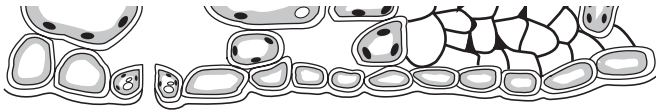
Question 10

0610/22 J25 ■ Q10 ■ 1 mark

10 The diagram shows a cross-section of part of a leaf.



Question 10



What is the cell labelled X?

- A** epidermis
- B** guard cell
- C** palisade mesophyll
- D** spongy mesophyll

Solution 10

Answer: **C**

Why

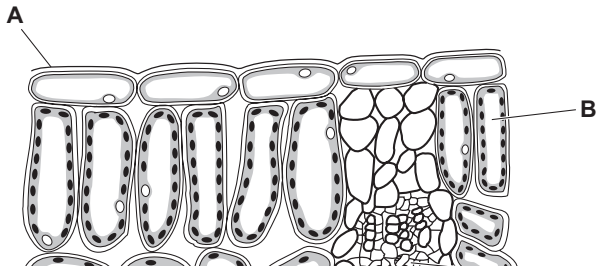
- Palisade mesophyll cells are the long, closely-packed column-shaped cells just under the upper epidermis.
- They contain the most chloroplasts, because they receive the most light.
- Spongy mesophyll below them is irregular with air spaces, and the epidermis has almost no chloroplasts.

Question 9

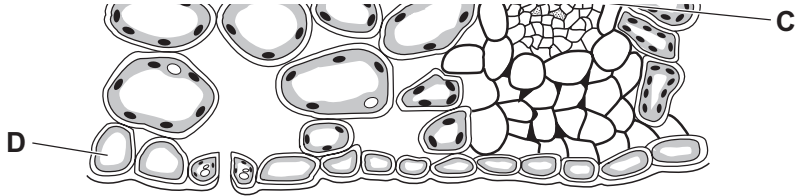
0610/23 J25 ■ Q9 ■ 1 mark

- 9 The diagram shows part of a cross-section of a leaf.

Which structure is a palisade mesophyll cell?



Question 9



Solution 9

Answer: **B**

Why

- Palisade mesophyll cells are the tall column-shaped cells just below the upper epidermis.
- They are packed tightly together and full of chloroplasts.
- Spongy mesophyll below is irregular with air spaces, and the epidermis has almost no chloroplasts.

Question 11

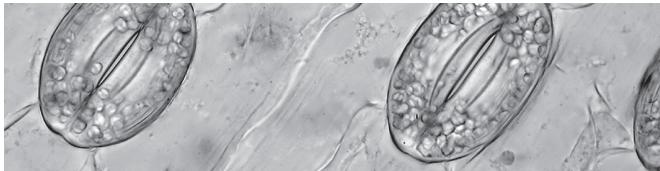
0610/22 M25 ■ Q11 ■ 1 mark

11 The photomicrograph shows part of the lower surface of a leaf.



X

Question 11



What is the structure labelled X?

- A** guard cell
- B** palisade mesophyll cell
- C** spongy mesophyll cell

Question 11

D xylem vessel

Solution 11

Answer: **A**

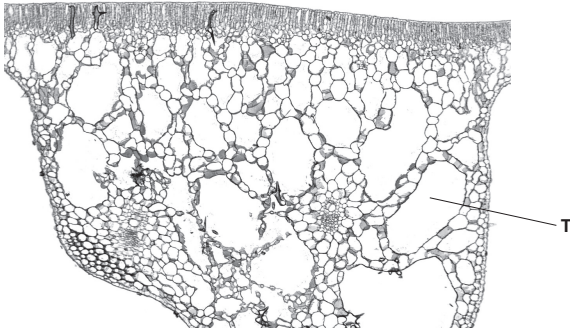
Why

- The lower surface of a leaf is where the stomata are.
- Each stoma is bounded by a pair of curved guard cells.
- Palisade cells are in the upper part of the leaf and xylem is inside the veins.

Question 5

0610/42 M25 ■ Q5 ■ 12 marks

5 (a) Fig. 5.1 shows a cross-section of a leaf.



Question 5

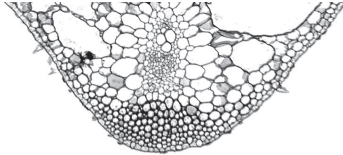


Fig. 5.1

- (i) On Fig. 5.1, draw a circle around **one** vascular bundle. [1]
- (ii) On Fig. 5.1, draw a label line and the letter **X** to identify the palisade mesophyll tissue. [1]
- (iii) State the name of the cell structure in palisade mesophyll cells where photosynthesis occurs.

Question 5

- (iv) Describe the functions of the tissues in a vascular bundle in a leaf.

Question 5

- (b)** The leaf shown in Fig. 5.1 is from an aquatic plant adapted to live in water. The leaves float on the surface of the water.
- (i)** State the term used to describe plants that are adapted to live in water.

Question 5

- (ii) Identify feature **T** shown in Fig. 5.1 **and** explain how this feature adapts the leaf to float on the surface of the water.

Question 5

[2]

- (iii) Explain **one** other adaptation of this group of aquatic plants.

Question 5

[Total: 12]

Solution 5

(a)(i)

Mark scheme

- circle drawn around one vascular bundle ;
- 1

(a)(ii)

Mark scheme

- X drawn to identify palisade mesophyll tissue ;
- 1

Solution 5

(a)(iii)

Mark scheme

- chloroplasts ;
- 1

Solution 5

(a)(iv)

Mark scheme

- ref to xylem and phloem ;
- phloem responsible for, translocation / transport of sucrose or amino acids ;
- xylem transports, water / mineral ions ;
- xylem provides support ;
- 4

Solution 5

(b)(i)

Mark scheme

- hydrophyte ;
- 1

Solution 5

(b)(ii) Mark scheme

- T:
- air space ;
- explanation:
- creates buoyancy / decreases density, (of leaf) ;
- 2
- 0610/42
- February/March 2025
- Guidance

Solution 5

(b)(iii) Mark scheme

- stomata on, upper epidermis / upper side of leaf ;
- allows gas exchange / AW ;
- or
- thin / no, cuticle ;
- no need to prevent water loss ;
- or
- AVP ;;
- 2 Explanation must be linked to correct

Solution 5

- description