Solutions

Marking: **M1** a correct method, **A1** the correct answer, **B1** an independent mark.

Each answer shows the steps, then the **result**.

2.1

- **palisade mesophyll**

2.2

- let **gases** in and out: CO_2 in, O_2 and water vapour out

2.3

- **(waxy) cuticle**
- reduces **water loss**

2.4

- P **xylem**: carries **water** and mineral ions
- Q **phloem**: carries **sucrose** / amino acids

2.5

- broad: large **surface area** to absorb **light**
- thin: **short distance** for gases to diffuse

3.1

B

3.2

(a)

- carbon dioxide can **diffuse in** for photosynthesis
- oxygen can diffuse out

(b) to reduce **water loss** by transpiration

3.3

(a)

- 8 stomata counted; density $= \dfrac{8}{0.2}$
- $=$ **40** per mm^2

(b)

- the lower surface is **cooler / shaded**
- so **less water** is lost through them

3.4

(a)

- E **cuticle**: waxy, reduces water loss
- F **palisade mesophyll**: many chloroplasts absorb light
- G **air space**: lets gases diffuse to cells
- K **phloem**: carries sucrose away

(b)

- **guard cell**
- it changes shape to **open or close** the stoma

(c)

- from the **xylem** into mesophyll cells (by osmosis)
- **evaporates** from cell surfaces into the **air spaces**
- **diffuses** out through the **stoma**