Questions are for both separate science and combined science students

Q1.

Plants are made of different tissues.

(a) Which term describes a group of tissues working together?

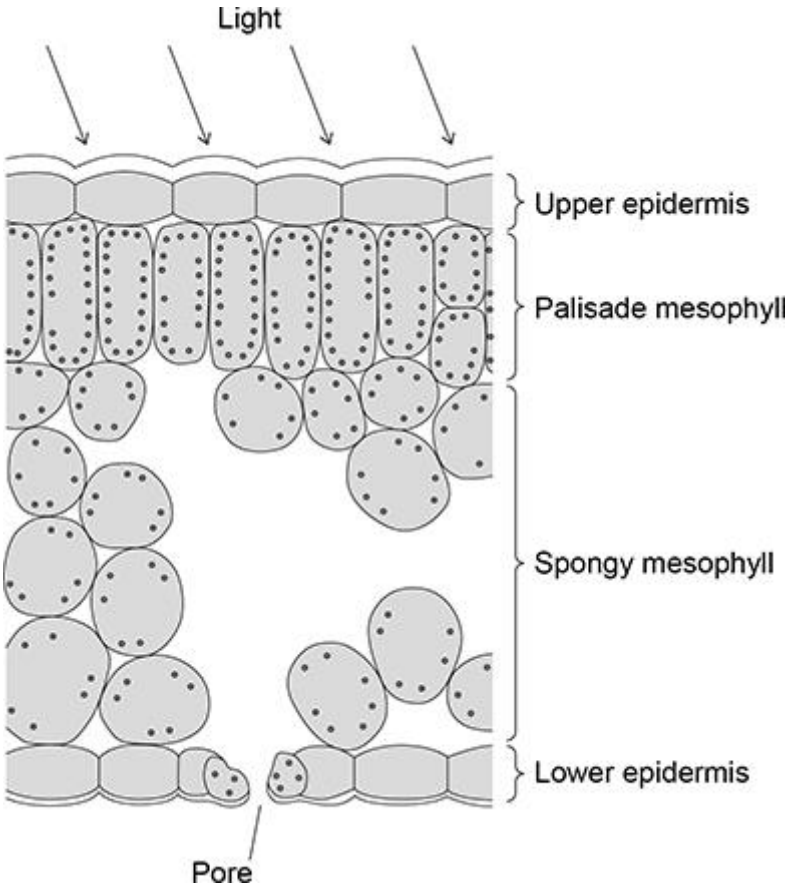
Tick (✓) **one** box.

Organ	☐
Organism	☐
Organ system	☐

(1)

Figure 1 shows the tissues in a leaf.

Figure 1



(b) Draw **one** line from each leaf tissue to an important feature of the tissue.

Leaf tissue	Feature
Palisade mesophyll	Contains many air spaces
Spongy mesophyll	Contains the most chloroplasts
	Made of dead cells

(2)

(c) Xylem tissue transports water to the leaves.

Which term describes the loss of water from the leaves?

Tick (✓) **one** box.

- Photosynthesis ☐
- Respiration ☐
- Transpiration ☐

(1)

(d) Which substance strengthens xylem tissue?

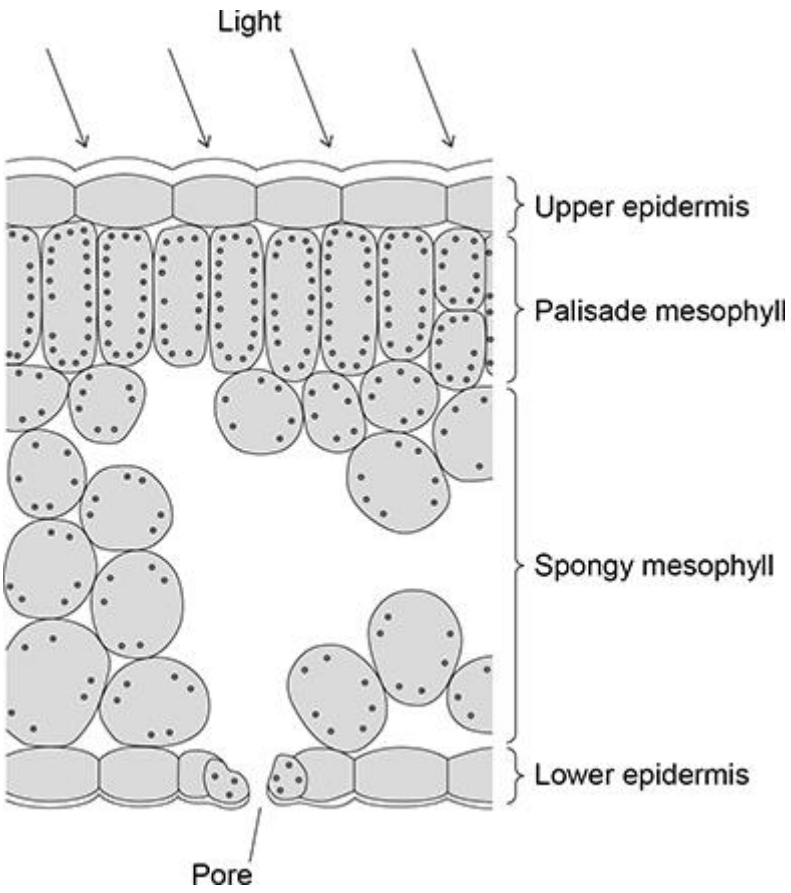
Tick (✓) **one** box.

- Glucose ☐
- Lignin ☐
- Starch ☐

(1)

Figure 1 is repeated below.

Figure 1



(e) The upper epidermis is transparent.

Explain why the upper epidermis needs to be transparent.

Use **Figure 1**.

_____

_____

_____

_____

(2)

(f) Complete the sentences.

Choose answers from the box.

chloroplasts	**guard cells**	**meristems**	**stomata**

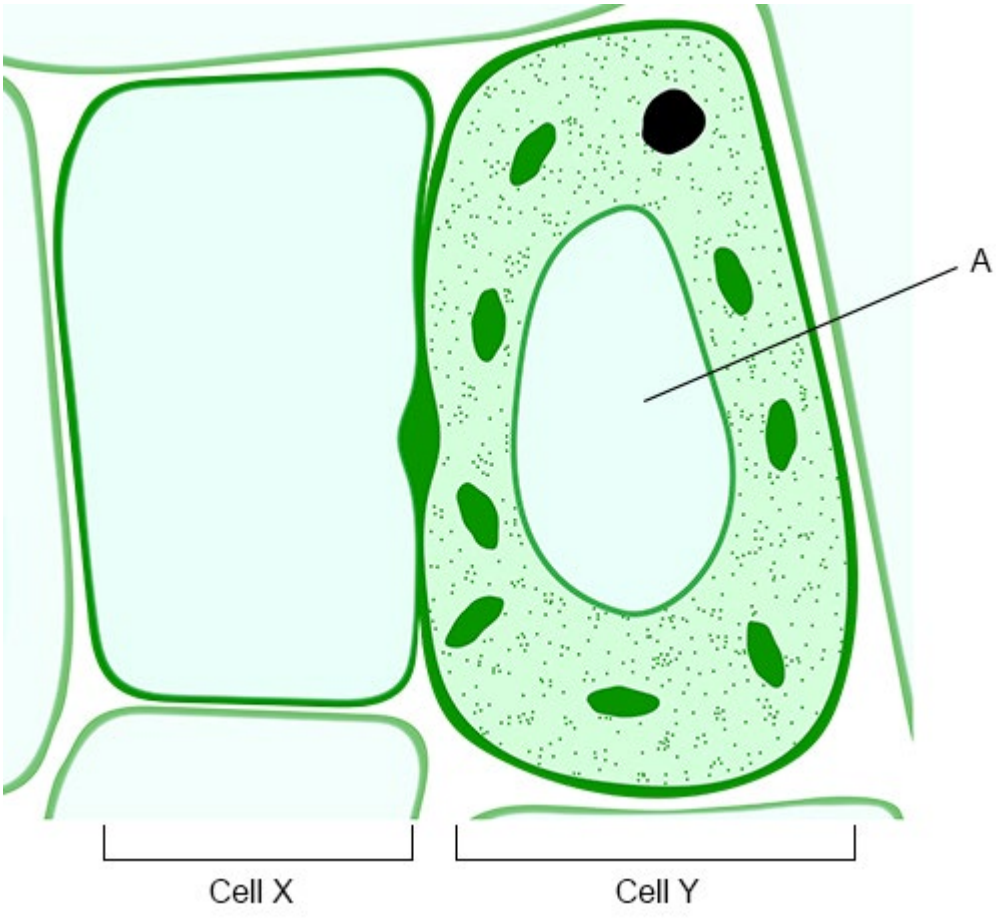
The pores in the lower epidermis of a leaf are called _____ .

The opening and closing of the pores in the lower epidermis is controlled by _____ .

(2)

Figure 2 shows two cells from phloem tissue.

Figure 2



(g) Part **A** in **Figure 2** contains cell sap.

Name part **A** in **Figure 2**.

_____

(1)

Sugars move from cell **Y** into cell **X** against the concentration gradient.

Energy is needed to move sugars against the concentration gradient.

(h) Which process moves sugars against the concentration gradient?

Tick (✓) **one** box.

- Active transport ☐
- Diffusion ☐
- Osmosis ☐

(1)

(i) Which cell structures are needed to provide energy to move sugars?

Tick (✓) **one** box.

- Chloroplasts ☐
- Chromosomes ☐
- Mitochondria ☐

(1)

(Total 12 marks)

Q2.

(a) Plants take up water from the soil through their roots.

Some of the water is used for photosynthesis.

Complete the word equation for photosynthesis.

Choose answers from the box.

fat	**glucose**	**nitrogen**	**oxygen**	**protein**

carbon dioxide + water → _____ + _____

(2)

(b) Water and dissolved substances are transported through a plant.

Complete the sentences.

Choose answers from the box.

epidermis	**guard cells**	**palisade cells**
phloem	**stomata**	**xylem**

Water moves from the roots to the leaves in the _____.

Water is lost from leaves through pores called _____.

Dissolved sugars are transported in the _____.

(3)

The table below shows the rate of transpiration in four different plant species.

Plant species	**Rate of transpiration in arbitrary units**
A	310
B	254
C	87
D	192

(c) Calculate how many times greater the rate of transpiration of species **A** is than the rate of transpiration of species **B**.

Give your answer to 2 significant figures.

_____

_____

_____

_____

_____

Number of times greater (2 significant figures) = _____

(3)

(d) Which factor could cause species **A** to have a higher rate of transpiration than species **B**?

Tick (✓) **one** box.

Each flower of species **A** has more petals. ☐

Each leaf of species **A** has more stomata. ☐

Each plant of species **A** has shorter roots. ☐

(1)

(e) Which environmental change would cause an increase in the rate of transpiration?

Tick (✓) **one** box.

Decreased light intensity ☐

Decreased wind speed ☐

Increased humidity ☐

Increased temperature ☐

(1)

(f) Which plant species in the table in part (c) is most likely to live in a dry desert?

Tick (✓) **one** box.

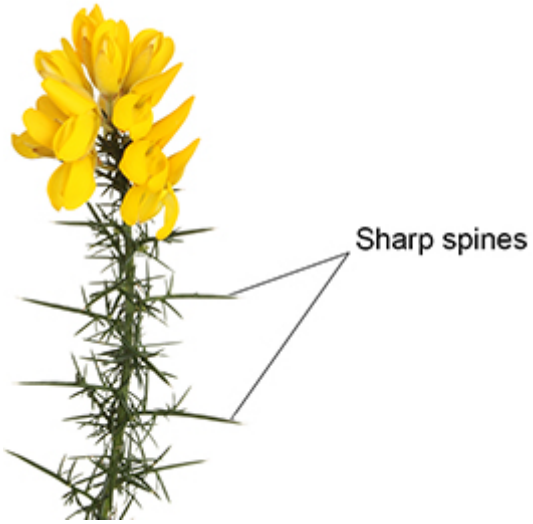
A ☐ **B** ☐ **C** ☐ **D** ☐

(1)

(g) Some plants have adaptations that help them survive.

Figure 1 shows part of a gorse plant.

Figure 1



How will the sharp spines help the gorse plant survive?

_____

_____

(1)

(h) Animals also have adaptations to help them survive.

Figure 2 shows two insects.

Figure 2

Hornets are insects that sting other animals and cause pain.

Hornet moths do **not** sting other animals.

Explain why animals avoid eating the **hornet moth**.

_____

_____

_____

_____

(2)

(Total 14 marks)