AQA GCSE Combined Science - Trilogy | 8464

SPECIFICATION POINT 4.2.1

Principles of organisation

Mark schemes and examiner comments

Tier	**Higher**
Question groups	**1**
Available paper years	**2023–2023**

Using this booklet

1. Booklet answer numbers match the question booklet.
2. Use the original question number within marking tables.
3. Examiner comments are included where available.

Name: _____ **Date:** _____

Where a precise marking extract is unavailable, the full source document is included in an appendix. Any missing mark scheme is explicitly identified.

4.2.1 Principles of organisation

Answer 01 · Mark scheme

June 2023 | 8464/B/1H | Original Q4

Question 4

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.1	A		1	AO1 4.2.1 4.2.3.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.2	has (large) air spaces (between cells) (so) gases can diffuse / move through the leaf to / from the photosynthetic / palisade / B layer	allow has (large) gaps (between cells) allow carbon dioxide **or** oxygen **or** water vapour for gases allow to / from the upper mesophyll if named gas given for mp 2 direction of movement must be correct if no other marks awarded allow **1** mark for cells have chloroplasts for photosynthesis	1 1 1	AO1 4.2.1 4.2.3.1

4.2.1 Principles of organisation

Answer 01 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.3		reason must correctly match the structure		AO1 4.2.1
	composed of hollow tubes / cells	allow cells are empty allow no cytoplasm / nucleus / sub-cellular structures	1	4.2.3.1 4.2.3.2
	(so) no obstruction to water flow	allow (so) water flows easily if linked to hollow tubes allow to maintain the transpiration stream	1	
	OR			
	has lignin (1)	ignore has thick walls		
	(to) hold tubes open (1) **or** (to) strengthen the tubes	allow (to) keep water inside xylem allow (to) make tubes rigid		
	OR			
	no end walls (1)			
	(so) water flows easily (1) **or** (so) water flows continuously	must be linked to an adaptation allow (so) maintains a constant water flow allow to maintain the transpiration stream		

4.2.1 Principles of organisation

Answer 01 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.4	water enters (guard) cells by osmosis	allow water enters (guard) cells because the concentration of water is higher outside the cell than inside the cell	1	AO2
	cells swell and curve (to open the stoma)	allow cells become turgid and curve (to open the stoma) allow inner wall of (guard) cell is thicker / stronger **or** less flexible than outer wall so cells curve (to open stoma)	1	AO3 4.1.1.2 4.1.1.3 4.1.3.2 4.2.3.1 4.2.3.2

Total Question 4	**8**

4.2.1 Principles of organisation

Answer 01 · Examiner comments June 2023 | 8464/B/1H | Original Q4

Question 4

04.1 Three fifths of students correctly identified Tissue A as the epidermis. A quarter of students thought Tissue B, the palisade mesophyll, was the epidermis.

04.2 Half of the students scored at least 1 mark, usually for saying that the spongy mesophyll is adapted for its function by having air spaces. A description of these was allowed, such as gaps or air pockets. Only a fifth of students went on to explain the function of the air spaces, to score 2 marks. There was quite a lot of confusion regarding how water enters a plant, many thinking that it entered via the leaves. Some students thought the spongy mesophyll was a storage tissue. Quite a lot of students gained the compensation mark for saying the cells of the spongy mesophyll have chloroplasts for photosynthesis.

04.3 Fewer than a third of students scored any marks on this question. An adaptation of xylem had to be described in order to gain any marks. If a correct adaptation was given, the reason had to match the structure. Quite a lot of students talked about long tubes, which was insufficient. A reference to them being hollow or empty was needed. Some students gained 2 marks for saying the cells are strengthened with lignin. Others said the xylem cells did not have end walls, but only a few explained why this was useful.

04.4 Students struggled to answer this question which was set at the highest level of demand. Very few scored any marks. The most common responses referred to the stoma needing to open to either allow the transfer of gases for photosynthesis, or to allow the excess glucose to leave the leaf. Some said the glucose would be used in respiration to transfer energy to open the stoma. Few attempted to describe what caused the stoma to open.