AQA GCSE Biology

Practice answers

Question	Answers	Extra information	Mark	AO / Specification reference
01.1	as a control / as a comparison with no petroleum jelly		1	AO2 2.3.2
01.2	balance	do not accept scales	1	AO2 2.3.2
01.3	points plotted correctly smooth curve of best fit	allow one plotting error plots to ±1 mm	2 1	AO2 2.3.2 MS4c
01.4	D water is lost from both surfaces		1 1	AO2 2.3.2
02.1	stoma labelled (gap between cells on the lower surface of the leaf)		1	AO2 2.3.2
02.2	when less water is available the guard cells close this reduces rate of diffusion of water vapour out of leaf / plant loses less water through transpiration	accept converse	1 1	AO1 2.3.2
02.3	30 µm	accept answer in range 25 – 40 µm $\left(\frac{250}{(6–8)}\right)$	1	AO2 2.3.2 MS1d
03.1	loss of water vapour from leaves of plants by evaporation from the surface of cells and diffusion through the stomata		1 1	AO1 2.3.2

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03.2	rate of transpiration < rate of water uptake some water taken in is used in photosynthesis		1 1	AO2 2.3.2
03.3	points plotted correctly straight line of best fit	Line must include (0, 0)	1 2	MS4a
03.4	directly proportional	do not accept simply 'proportional'	1	AO2 2.3.2
03.5	12.5 min	Accept in range 12 – 13 min	1	AO2 2.3.2 MS4a
03.6	rate = change / time $= \frac{8}{10}$ = 0.8 mm/min		1 1 1 1	AO2 2.3.2 MS3d
03.7	gradient would be steeper as the rate of transpiration would be greater		1 1	AO2 2.3.2 MS4a
04.1	vascular bundle		1	AO1 2.3.2
04.2	movement of (dissolved) sugars (from the leaves to the rest of the plant)		1	AO1 2.3.2

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04.3	any **four** from: • phloem – living, xylem – dead • xylem contains lignin • which builds up in spirals in cell walls • forms one continuous hollow tube • phloem contains sieve plates • phloem cells supported by companion cells		4	AO1 2.3.2 1.1.3
04.4	phloem contains dissolved sugars (which the greenfly feed on)		1	AO2 2.3.2
05.1	place several strips of (nail) varnish on the leaf / several leaves and allow to dry peel the varnish off the leaf and place on a microscope slide observe the strip of varnish (under a set magnification) and count stomata in the field of view		1 1 1	AO2 2.3.2
05.2	$\frac{36+42+35+41+37}{5}$ = 38	award 2 marks for correct answer with no working shown award 1 mark for 38.2	1 1	AO2 2.3.2 MS 2a, b
05.3	upper surface is exposed to the sun / greater heat which would cause greater rate of evaporation if stomata were on top side	accept converse	1 1	AO1 2.3.2

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06.1	palisade mesophyll		1	AO2 2.3.2
06.2	contains chloroplasts		1	AO1 1.1.3 2.3.2
06.3	osmosis from a region of high water concentration to a region of lower water concentration		1 1	AO1 1.3.2 2.3.2
06.4	**Level 3:** The descriptions are detailed and accurate. The reasons given are clear and coherent.		6	AO1 1.1.3 2.3.2
	Level 2: The descriptions are correct, although lacks detail. Reasons are given for some, although these may not be clearly explained.			
	Level 1: The descriptions lack clarity and coherence.			
	No relevant content.			

Question	Answers	Extra information	Mark	AO / Specification reference
	Indicative content: **top of leaf:** • (tightly packed) palisade cells • contain many chloroplasts for photosynthesis • upper cells protected by epidermis • waxy surface reduces water loss from upper surface **middle of leaf:** • spongy mesophyll cells • have large air spaces / surface area to maximise gas exchange • xylem supplies water for photosynthesis • phloem transports dissolved sugars from photosynthesis to plant **lower part of leaf:** • stomata open or close through action of guard cells • to let carbon dioxide diffuse in to allow oxygen / water vapour to diffuse out			

Question	Answers	Extra information	Mark	AO / Specification reference
07.1	large surface area available for water / minerals to move into the cell large permanent vacuole to speed up movement of water into cell by osmosis many mitochondria to release energy needed for active transport of mineral ions into the cell		1 1 1	AO1 1.1.3 2.3.2
07.2	process Y – active transport concentration of mineral ions is usually lower in soil than in plant cells		1 1	AO2 1.3.1 1.3.3 2.3.2
07.3	xylem		1	AO1 1.1.3 2.3.2
07.4	any **one** from: • magnesium – for chlorophyll manufacture • nitrates – to produce amino acids / proteins	both mineral and use required for mark accept other correctly named mineral and its use	1	AO1 1.3.3 2.3.2

Question	Answers	Extra information	Mark	AO / Specification reference
08.1	radius = 0.20 mm		1	AO2
	area visible = πr^2		1	2.3.2
	area = $\pi \times 0.20^2 = 0.13$ mm^2	award 3 marks for 0.13 mm^2	1	MS1c
	density = $\frac{\text{number}}{\text{area}}$			MS3d
	$= \frac{6}{0.13}$	ecf for incorrectly calculated area	1	
	= 46(.1) stomata / mm^2	46.1 stomata / mm^2 scores 5 marks	1	
08.2	trace shape of leaf onto (cm^2) graph / squared paper	accept answer which converts complex shape into simple shapes (rectangles / triangles), area is sum of area of shapes	1	AO3
	count squares contained within outline – count ½ square or more, ignore < ½ square		1	MS5c
08.3	46(.1) stomata / mm^2 = 4600 stomata / cm^2		1	AO2
	total stomata = density × area			MS3d
	= 4600 × 8		1	
	= 36 800		1	
08.4	fewer stomata		1	AO2
	because upper surface is exposed to the sun / greater heat		1	2.3.2
	which would cause greater rate of evaporation if stomata were on top side		1	

Question	Answers	Extra information	Mark	AO / Specification reference
09.1	loss of water vapour from leaves of plants by evaporation from the surface of cells and diffusion through the stomata		1 1	AO1 2.3.2
09.2	impermeable		1	AO1 2.3.2
09.3	rolled shape reduces surface area exposed to less humid air / wind / heat leaf hairs / rolled shape trap(s) moist air, increasing the humidity within the structure stomata in pits minimise surface area / exposure to ambient air for diffusion		1 1 1	AO3 2.3.2
10.1	length = 50 mm magnification = $\frac{\text{apparent size}}{\text{actual size}}$ = $\frac{50}{0.25}$ = ×200	accept 48 – 52 mm	1 1 1	AO2 1.1.5 2.3.1 2.3.2 MS 1c MS3d
10.2	xylem vessels have a larger diameter		1	AO2 2.3.1 2.3.2

Question	Answers	Extra information	Mark	AO / Specification reference
10.3	lignin		1	AO1 2.3.1 2.3.2
10.4	add stain to water and place stem of plant into water leave for water to be taken into the stem / absorbed via the xylem vessels / move due to transpiration stream cut a cross section of stem to view the stained vascular bundle (using a microscope)		1 1 1	AO2 2.3.1 2.3.2

Question	Answers	Extra information	Mark	AO / Specification reference
10.5	any **six** from: • if deer eat new growth / shoots, there are fewer leaves for photosynthesis • to produce food / energy for the plant to grow • if deer eat bark / rub antlers against bark to mark territory the phloem would be damaged / destroyed • phloem required to transport sugars made by photosynthesis around plant • by translocation • if phloem damaged, dissolved sugars will not be delivered so affecting / preventing growth of sapling as sugars are needed to produce new cells • lack of sugars prevent respiration in tree cells • reducing the energy available for growth • protective collar is placed to prevent new shoots / bark being eaten / antler damage to bark until the sapling is fully established		6	AO3 2.3.2

Question	Answers	Extra information	Mark	AO / Specification reference
11	• stem cells are undifferentiated cells • some / embryonic stem cells are able to develop into brain cells **arguments for:** • stem cell therapy could provide a cure • no alternative therapy currently exists • stem cells could be used to test new dementia drugs, instead of testing on human or animals **arguments against:** • adult stem cells cannot differentiate into required cell type • only embryonic stem cells are able to differentiate into required cell types • use of embryonic stem cells destroys an embryo • people object to the use of embryos for stem cell research for ethical, social and religious reasons • stem cell therapy may not offer a cure • stem cell therapy may lead to other medical conditions / infection	to gain full credit, answers should include at least two arguments **for** stem cell research, and two arguments **against**	6	AO3 1.2.3
12.1	A		1	AO2 1.1.1

Question	Answers	Extra information	Mark	AO / Specification reference
12.2	to help the bacterial cell move		1	AO2 1.1.1
12.3	genetic material is not contained within a nucleus plasmids are present		1 1	AO2 1.1.1
12.4	×73000		2	AO2 1.1.1 MS1d MS2a

Question	Answers	Extra information	Mark	AO / Specification reference
13.1	**method:** • cut six strawberry cores / chips / cubes • dry sample surface • measure mass of cores using a balance • place one core in each solution • leave for period of time (min. ½ hour) • remove cores and dry surface • re-measure mass of cores **control variables:** • leave in solution for same period of time • use same volume of sucrose solution • same diameter / surface area of strawberry cores • same starting mass of strawberry cores **determination of sucrose concentration:** • calculate change in mass for each sample • plot change in mass (*y*-axis) v sucrose concentration (*x*-axis) • sucrose concentration can be read from where line crosses *x*-axis	to gain full credit, answers should include a method which would lead to a valid set of data, with an explanation of how the sucrose concentration would be determined award up to 3 marks for sensible method award 1 mark for identification of **two or more** control variables award up to 2 marks for determination of sucrose concentration	6	AO2 1.3.2

Question	Answers	Extra information	Mark	AO / Specification reference
13.2	**advantages:** • the more water added, the larger the fruit will become • the grower therefore has a greater yield / mass of crop to sell • larger fruit look more attractive to consumers • so could command a higher price at market **disadvantages:** • additional water costs • may outweigh gain from producing larger fruit • additional water may dilute sucrose concentration, reducing fruit sweetness • which may reduce the value of the crop	to gain six marks, answers should include a discussion of at least one advantage and disadvantage within their answer. award 1 mark for each suggestion, and 1 mark for linked reasoning accept other reasonable advantage or disadvantage if supported by reasoning	6	AO3 1.3.2
14.1	fish is much larger than an amoeba so has a lower to surface area volume substances like oxygen / other named substance need to be transported to cells within the organism / that are not on the surface		1 1 1	AO2 4.2.2.2

Question	Answers	Extra information	Mark	AO / Specification reference
14.2	any **four** from: **similarities:** • have two atria / a left and a right atrium • blood returns to the heart through the vena cava / into the right atrium • contain valves • a separate blood vessel takes blood to the lungs to be oxygenated • blood passes twice through heart for complete circulation / systemic and pulmonary systems / to lungs and body **differences:** • in frog, ventricles not separated / one ventricle / partial or no septum • in frog, single vessel leaves the heart (which then splits) • oxygenated and deoxygenated blood not (fully) separated	to gain 4 marks, answers should include **two** similarities and **two** differences	4	AO1 AO2 4.2.2.2

Question	Answers	Extra information	Mark	AO / Specification reference
14.3	any **three** from: • blood will not be fully oxygenated as not all of it passes through the lungs • deoxygenated and oxygenated blood mixed • blood supplied to body still carrying carbon dioxide • lower pressure / less force / push from ventricle • as the heart is supplying blood to lungs and body • so transport system is slower / heart needs to beat more times		3	AO3 4.2.2.2