

APOLLO

Adaptation to environment

SL

Biology

First assessment 2025

7 questions | mark schemes

Mark-scheme answers

Biology SL | Paper 1A | May 2025 TZ3 | Q24 | 1 marks

24. C

1.	a		any guard cell correctly labelled;	<i>Line must touch part of guard cell. Do not allow a circle around the whole stoma.</i>	1
1.	b		magnification of both lenses multiplied together (eyepiece/ocular and objective lens);		1
1.	c	i	(count) number of stomata (within field of view / image) AND divide by the area / field of view;		1
1.	c	ii	repeat with other areas of cast/leaf AND calculate the mean/average OR repeat/replicate with more leaves AND calculate the mean/average;		1 max
1.	d		a. aerial/upwards/vertical roots/pneumatophores / lenticels/pores; b. for gas exchange/respiration; ALTERNATIVE 1 c. thick impermeable outer layer/suberin; d. reduce salt absorption; ALTERNATIVE 2 e. (root) cells can accumulate solutes; f. reduce water loss due to osmosis/dehydration; ALTERNATIVE 3 g. buttress/prop/stilt roots; h. increase stability in swampy/muddy soils;	<i>Max 1 mark for correct feature or explanation alone. Explanation must match adaptation for 2 marks.</i> <i>a: Accept surface roots or roots out of the water.</i> <i>e: Accept reverse osmosis.</i> <i>g: Do not accept deep/long/tangled roots.</i>	2 max

Question	Answers	Notes	Total
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Mark-scheme answers

Biology SL | Paper 1A | Nov 2025 TZ1 | Q1 | 1 marks

1. C

Biology SL | Paper 1A | Nov 2025 TZ3 | Q21 | 1 marks

21. B

Biology SL | Paper 1A | Nov 2025 TZ3 | Q24 | 1 marks

24. D

Apollo | Original source crop | 5

Question			Answers	Notes	Total
1.	f		a. group 1 because there is less gap between T_{opt} and T_{max} OR group 1 is more likely to be adversely affected by increase in soil temperature because they have a narrow range of tolerance for higher temperatures than in group 2; b. group 1 because T_{max} is lower in most species; c. if global warming heats up the soil temperature, the seeds will germinate earlier which may be adverse (in either group); d. group 2 because T_{opt} is (generally) lower (than group 1); e. however, some species in group 2 have as low a T_{max} as group 1, therefore some species in group 2 will be adversely affected; f. species (regardless of group) may be adversely affected because increasing soil temperature means less water available for germination;		2 max

Question	Answers	Notes	Total
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7.	a	a. evolution occurs by natural selection; b. analogous structures come from convergent evolution; c. analogous structures have similar functions or structures evolved from different ancestry; d. similar conditions/environments have similar selective pressures favouring similar adaptations; e. similar functions/functional requirements result in similar adaptations/structures; f. e. g. torpedo shaped body in sharks and whales to facilitate swimming/ another verified example;	4 max
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7.	b	a. wide-spreading roots allow water collected from large area; b. water storage tissue/thick leaves/stem survival during (long) droughts/periods without rainfall; c. deep roots to collect water from greater depths/underground sources; d. vertical stems to reduce exposure to sun at midday/heating when the sun is overhead/hottest OR pleated stems to allow shrinkage and reswelling/to store water; e. few stomata transpiration reduced/minimizes; f. waxy cuticle conserves water; g. stomata open at night reduces transpiration; h. no leaves/narrow leaves/leaves as spines/scales decreases surface area/reduces stomata/transpiration/water loss; i. rolled leaves/hairs around stomata harness humidity/decrease water loss; j. pitted/sunken stomata reduces transpiration/water loss;	7 max
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Question			Answers	Notes	Total
7.	c		a. piercing mouthparts/stylet for feeding on/sucking out sap; b. chewing mouthparts/mandibles for eating leaves/stems/wood; c. grinding teeth/ridged molars; d. multiple stomachs/long caecum/intestine for better digestion; e. able to detoxify plant toxins; f. make cellulase to digest cellulose/harbour cellulase producing microbes; g. e.g. some birds/hummingbirds have long beak/tongue for extracting nectar / any verifiable adaptation for feeding or digestion;		4 max