

Markscheme

May 2026

Biology

Standard level

Paper 1B

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Subject Details: Biology SL Paper 1B Markscheme

Candidates are required to answer **all** questions in Paper 1B. Maximum total = **25 marks**.

1. A markscheme often has more marking points than the total allows. This is intentional.
2. Each marking point has a separate line and the end is shown by means of a semicolon (;).
3. An alternative answer or wording is indicated in the markscheme by a slash (/). Either wording can be accepted.
4. An alternative answer is indicated by “**OR**”. Either answer can be accepted.
5. An alternative markscheme is indicated under heading **ALTERNATIVE 1** etc. Either alternative can be accepted.
6. Words in brackets () in the markscheme are not necessary to gain the mark.
7. Words that are underlined are essential for the mark.
8. The order of marking points does not have to be as in the markscheme, unless stated otherwise.
9. If the candidate’s answer has the same “meaning” or can be clearly interpreted as being of equivalent significance, detail and validity as that in the markscheme then award the mark. Where this point is considered to be particularly relevant in a question it is emphasized by **OWTTE** (or words to that effect).
10. Remember that many candidates are writing in a second language. Effective communication is more important than grammatical accuracy.
11. Occasionally, a part of a question may require an answer that is required for subsequent marking points. If an error is made in the first marking point then it should be penalized. However, if the incorrect answer is used correctly in subsequent marking points then **follow through** marks should be awarded. When marking indicate this by adding **ECF** (error carried forward) on the script.
12. Do **not** penalize candidates for errors in units or significant figures, **unless** it is specifically referred to in the markscheme.

Question		Answers	Notes	Total
1.	a	a. cell wall; b. cell/plasma membrane;	<i>Do not award a mark if another organelle/structure other than the correct answer is given (e.g. chloroplast).</i> <i>Mp b. Do not accept membrane on its own.</i> <i>Mp b. Do not accept reference to the membrane of an organelle, such as a chloroplast.</i>	1 max
1.	b	a. eukaryotic as it has a nucleus; b. eukaryotic as it has a (large/sap) vacuole / membrane-bound organelle; c. eukaryotic as it is compartmentalized;	<i>Do not award marks for evidence that is not shown in the micrograph, for example, 80S ribosomes or Golgi apparatus, unless two pieces of evidence are given and one of them is correct, but do not award the mark if there's a contradiction. For example, accept "Eukaryotic, because it has a cell wall and a nucleus", but do not accept "Eukaryotic, because it has a nucleus and plasmids".</i> <i>Mp b. Do not accept organelle on its own.</i> <i>Do not accept cell wall.</i>	1 max
1.	c	a. obtain epidermis/lower layer/single/thin layer of tissue; b. place (the tissue) on <u>slide</u>; c. place a drop of water/stain/dye/iodine solution (on the tissue); d. add cover slip/piece of glass/OWTTE; e. lower it at an angle/carefully (to avoid air bubbles) OR press gently (to avoid bubbles);	<i>Mp a. OWTTE, but it must refer to how a tissue is obtained (e.g. peeled or cut) and that it is thin/small enough to be seen under the microscope.</i> <i>Mp c. Accept another example of stain or dye.</i> <i>Do not accept answers referring to viewing the mount under the microscope.</i>	3 max

Question		Answers	Notes	Total
2.	d	a. test a range/intermediate/additional concentrations of sodium hydrogen carbonate; b. to identify the optimum concentration/maximum rate; c. perform more trials/repeats OR add more leaf discs (to the beakers); d. (to) increase reliability/precision/accuracy OR (to) allow a mean (rate)/standard deviation/SD to be calculated OR (to) allow for statistical testing; e. ensure temperature/light/size of discs/named variable that could affect rate of photosynthesis are controlled/at optimum levels; f. increase the duration of the experiment OR use a more precise timer OR use smaller time intervals; g. boil water in the control group; h. to remove all carbon dioxide; i. count the number of oxygen bubbles / measure the volume of oxygen gas / use an oxygen probe;	<i>Accept answers describing one idea thoroughly as well as multiple ideas briefly.</i> <i>Do not accept answers stating that more independent variables should be investigated (e.g. do not accept “repeat the experiment at a different temperature” or “use a different type of a plant”).</i> <i>Mp a. It must be clear that the answer refers to additional concentrations of a source of carbon dioxide.</i> <i>Mp a. Do not accept “amount” for concentration.</i> <i>Mp a. Do not accept answers implying replacing the control group with another concentration of sodium hydrogen carbonate.</i> <i>Mp b. Do not accept general statements about the effect of carbon dioxide on photosynthesis rate.</i> <i>Mp e. Do not accept the size of leaves as a controlled variable.</i> <i>Mp i. Accept any other verified and specific description of an alternative method of measurement of photosynthesis. Do not accept “use an alternative measurement” on its own. Do not accept vague statements, such as “use a tool to measure oxygen”.</i>	2 max

Question			Answers	Notes	Total
3.	a		volume of air that can be exhaled/inhaled/taken in a (single) breath/ventilation/respiratory cycle/OWTTE;	<i>Do not accept the word “amount” or “measure” for volume.</i> <i>Do not accept reference to maximum air breathed.</i> <i>Reference to a single breath or a complete inhalation/exhalation required for the mark.</i> <i>Do not accept answers referring to several breaths or dividing the volume over a number.</i>	1
3.	b		a. student inhales as much as possible/maximum inhalation; b. student exhales maximum volume of air into the spirometer/mouthpiece/apparatus OR student measures the distance moved up by the piston after a maximum exhalation;	<i>Mp a. Do not accept answers referring to inhalation with the mouth on the mouthpiece.</i> <i>Mp a. and b. It must be clear that a student refers to a forced inhalation/exhalation, but accept OWTTE. Yet, do not accept “as fast as possible” or “big/large”.</i> <i>Mp b. Reference to the equipment required for the mark.</i> <i>Do not accept reference to oxygen for air.</i>	2

Question		Answers	Notes	Total
3.	c	Muscle action [2 max] a. diaphragm contracts/flattens/moves down; b. (external) intercostal muscles contract; c. abdominal muscles/(internal) intercostal muscles relax; Causes of inhalation [2 max] d. increasing lung/chest/thorax volume OR lung/chest/thorax expands OR rib cage is pulled upwards/outwards; e. decreasing lung pressure;	<i>Ignore any reference to exhalation.</i> <i>Mp b. Do not accept external intercostal muscles relax.</i> <i>Mp c. Do not accept internal intercostal muscles contract.</i> <i>Mp c. Do not accept stomach muscles for abdominal muscles.</i> <i>Mp b. and c. When an answer states that both external and internal intercostal muscles contract or relax at the same time, do not award marks.</i> <i>Mp a., b. and c. Do not accept constrict or expand for contract.</i> <i>Mp d. Do not accept volume on its own or reference to the volume of oxygen.</i> <i>Mp e. Do not accept pressure on its own.</i>	3 max

Question			Answers	Notes	Total
4.	a		9.3;	<i>Units not required.</i> <i>Accept answers between 9.2 and 9.4.</i> <i>Only mark the first answer given but do not give the mark if it is a range.</i>	1
4.	b		(mean) number/quantity of spots (per fish);	<i>Do not accept “amount” instead of “number”.</i> <i>Accept “average”.</i> <i>If more than one answer is given, mark the first one provided, but do not award a mark if they refer to an independent variable in this investigation (number of months or the type of the predator).</i>	1

Question			Answers	Notes	Total
4.	c		a. female guppies mate/reproduce with males with more spots more frequently OR <u>sexual selection</u> for more spots; b. thus, the spotted trait/characteristic/phenotype/allele is passed on to offspring OR increasing the frequency of the spotted trait/characteristic/phenotype/allele in the offspring/with each generation; c. natural selection has occurred;	<i>Mp a. The answer must refer to mating/reproduction, not just attracting females.</i> <i>Mp b. Do not accept gene.</i>	2 max
4.	d		a. control ponds with no predators showed an increase in number of spots/variations; b. in ponds with cichlids/strong predators the number of spots/variations decreased OR the stronger predator/cichlid negatively affected the number of spots/variations in the offspring; c. (ponds with) weaker predator/<i>Rivulus</i> show increased numbers of spots/variation OR the presence of a weaker predator/<i>Rivulus</i> does not affect the number of spots/variations; d. the effect depends on the type of predator/strong or weak;	<i>Do not accept reference to the lowest/highest, more/less number of spots, without referring to decrease /increase in number of spots.</i>	3 max