

Markscheme

November 2025

Biology

Standard level

Paper 1B

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Subject Details: Biology SL Paper 1b Markscheme

Candidates are required to answer **all** questions. 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	i	third row (from the top);	<i>Accept an arrow going to the third row or underlined. Must indicate the entire row.</i>	1
1.	a	ii	48 / 24 <u>pairs</u> ;		1
1.	b		female as all chromosome pairs are similar in size/length OR female because in males X is larger than Y;	<i>Must refer to size; do not accept absence of Y. Female alone does not get a mark.</i>	1
1.	c		a. photograph/image of chromosomes in metaphase/mitosis/cell division; b. chromosomes arranged in (homologous) pairs; c. (pair chromosomes) according to size/length/centromere position; d. (pair chromosomes) by banding pattern;		2 max

Question		Answers	Notes	Total
2.	a	temperature / precipitation / winds / humidity / light / slope / soil / pH;		1
2.	b	(physical) place/environment where a community/species/population/organism lives;	<i>OWTTE</i> <i>Do not accept e.g. “an organism’s environment” without stating that it is where it lives.</i>	1
2.	c	a. transect; b. quadrats; c. placed randomly/periodically; d. each different species identified; e. using (dichotomous) keys / software/app; f. use specific rule to decide if species in/out the quadrat; g. numbers of each species counted;	<i>The answer ideally refers to the data but the question does not specify.</i> <i>b. Accept traps (to catch animals).</i> <i>f. Allow marking, release, recapture or a description.</i>	3 max

Question		Answers	Notes	Total
3.	a	enzyme/papain/bromelain concentration OR type of enzyme OR time (24 and 48 hrs);	<i>Do not accept enzyme alone.</i>	1
3.	b	(as concentration increases) tyrosine increases (at both times) OR positive correlation;		1
3.	c	a. 48 h/hours has higher activity / more tyrosine produced than after 24 h/hours; b. only 48 h/hours has a (nearly) constant increase in tyrosine OR 48 h/hours has a steeper gradient/sharper rise;	<i>Or vice versa.</i> <i>Do not accept faster rate OWTTE.</i>	2
3.	d	a. proteins are digested/broken down/degraded into <u>amino acids</u> ; b. the more (protease) activity the more amino acid/tyrosine produced; c. not all proteins contain tyrosine / have different amounts OR some tyrosine is released with no enzyme; d. other amino acids could be measured;	<i>a. Accept proteins are composed of amino acids.</i>	3 max

Question			Answers	Notes	Total
4.	a		a. budding; b. asexual reproduction / mitosis; c. unequal cytokinesis;	<i>a. and b. Accept description of process. Do not accept description of meiosis. Do not accept (binary) fission.</i>	2 max
4.	b		point/substitution / deletion / insertion / frameshift (mutation);	<i>Do not accept (skin) cancer.</i>	1
4.	c		food / energy/ATP/respiration / osmotic concentration/water potential;	<i>Accept nutrients/nutrition and fermentation.</i>	1
4.	d	i	UV/sunlight kills yeast in (control) 2 but not in (control) 1 OR more mutations in (control) 2 which inhibits reproduction/colony growth;	<i>Accept vice versa and OWTTE. A reason must be given e.g. kills yeast, not just presence or absence of UV/sunlight. Do not accept light alone.</i>	1
4.	d	ii	SPF50 blocks/absorbs more UV/sunlight / more protection against UV/sunlight OR SPF50 greater reduction in mutation/damage in yeast;	<i>Accept vice versa.</i>	1
4.	e		a. cotton clothes give more UV/sunlight protection (than polyester); b. results in yeast may not be the same as in humans; c. limited data / no repeats so difficult to evaluate / assess significance;	<i>a. Or vice versa. c. Allow a specific limitation e.g. thickness/colour of fabric.</i>	2 max