

APOLLO

Mutation and gene editing

SL

Biology

First assessment 2025

7 questions | mark schemes

Mark-scheme answers

Biology SL | Paper 1A | May 2025 TZ2 | Q17 | 1 marks

17. A

Biology SL | Paper 1A | May 2025 TZ2 | Q29 | 1 marks

29. A

Biology SL | Paper 1A | May 2025 TZ3 | Q8 | 1 marks

8. A

Biology SL | Paper 1A | Nov 2025 TZ1 | Q7 | 1 marks

7. C

4.	a		a. budding; b. asexual reproduction / mitosis; c. unequal cytokinesis;	<i>a. and b. Accept description of process.</i> <i>Do not accept description of meiosis.</i> <i>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.</i> <i>A reason must be given e.g. kills yeast, not just presence or absence of UV/sunlight.</i> <i>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.</i> <i>c. Allow a specific limitation e.g. thickness/colour of fabric.</i>	2 max

Mark-scheme answers

Biology SL | Paper 1A | Specimen 2025 | Q8 | 1 marks

8. B

7.	a		a. mutations are random changes in the sequences of genes/DNA; b. (mutation) may involve addition/deletion/substitution/inversion of DNA bases; c. (mutations) in tumour suppressor genes/oncogenes; d. uncontrolled cell division/mitosis occurs; e. abnormal cells cannot perform their function; f. they divide repeatedly to form tumours;		4
7.	b		a. name of condition e.g. PKU / other example; b. mutation in the gene for (the enzyme) phenylalanine hydroxylase (PAH) / if other example used name of gene that is mutated; c. outline of inheritance pattern, e.g. both parents need to carry the recessive allele; d. (without dietary modification, result is) toxic build-up of phenylalanine in the blood / low levels of tyrosine / symptoms if other example used; e. phenylalanine is not converted to tyrosine (by the enzyme) / effect of the mutation on the protein/enzyme/metabolism if other example used; f. requires dietary modification (as treatment) / treatment for other example used;		4

(continued...)

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SPEC/4/BIOLO/SP2/ENG/TZ0/XX/M

(Question 7 continued)

Question		Answers	Notes	Total
7.	c	a. new phenotypes/traits may result from mutations; b. mutations increase variation/differences between individuals in a population/species; c. individuals with new phenotype/trait may have more chances of survival; d. (more chances of survival) in a changing environment / presence of selection pressures; e. (selection pressure can be) intraspecific competition/abiotic factor; f. natural selection occurs; g. individuals with (advantageous) mutation have longer life spans/live longer; h. (so) more chances of reproduction; i. mutated gene passed on to new generations; j. allele frequencies change in the population over time; k. evolution is a consequence of natural selection;		7

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SPEC/4/BIOLO/SP2/ENG/TZ0/XX/M

Question	Answers	Notes	Total
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