

APOLLO

Cell and nuclear division

HL

Biology

First assessment 2025

9 questions | mark schemes

Mark-scheme answers

Biology HL | Paper 1A | May 2025 TZ1 | Q19 | 1 marks

19. D

Biology HL | Paper 1A | May 2025 TZ1 | Q22 | 1 marks

22. A

Biology HL | Paper 1A | May 2025 TZ2 | Q19 | 1 marks

19. B

Biology HL | Paper 1A | May 2025 TZ2 | Q30 | 1 marks

30. D

8.	a	a. cell walls are found in plant cells but not in animal cells; b. vacuoles are large in plant and small in animal cells; c. chloroplasts/plastids present in plants but not in animals cells; d. centrioles present in animal cells but not in plant cells; e. cilia/flagella present in (some) animal cells but not in plant cells; f. lysosomes present in animal cells but not in plant cells;	<i>Accept answers in a table format.</i> <i>Note: There must be a clear difference between the 2 types of cells.</i> <i>Accept clearly annotated diagrams if the differences are evident and help to distinguish between the 2 cells.</i>	3 max
8.	b	a. (some) herbivores have piercing/chewing/jaw-like/modified mouthparts/teeth/tough mandibles to eat/chew leaves OR (some) herbivores have proboscis to suck nectar; b. (some) herbivores/ruminants have different stomachs/cellulase to digest plant/cellulose; c. (some) herbivores detoxify plant toxins; d. (some) plants resist herbivory using/by the presence of (sharp) thorns/spines/spikes/other physical structures; e. (some) plants have stings to cause pain/burning sensations / bad/unpleasant taste; f. (some) plants produce toxins/toxic chemicals/(secondary) compounds/metabolites (in seeds and leaves) to avoid predation by herbivores;	Max 2 for herbivores and Max 2 for plants.	4 max

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2225 – 6015

Question		Answers	Notes	Total
8.	c	Similarities: [6 max] a. (in both plants and animals) produces two <u>genetically</u> identical daughter cells; b. maintains the chromosome number/genome of cell / produces diploid/2n cells; c. used for generation of new cells/cell replacement/tissue repair/growth; d. in prophase the chromatin/chromosome condenses/formation of chromatids/supercoiling of chromosomes; e. supercoiling of DNA around histones (to form nucleosomes); f. microtubules/microtubule motors to move chromosomes/chromatids; g. in metaphase chromosomes align in equator of cell; h. in anaphase separation of chromatids; i. in telophase two nuclei/cells form / nuclear membrane/envelope reforms OR cytokinesis is the division into two cells; Differences: j. in animal cell centrosomes/centrioles facilitates the organization of the mitotic spindle/ spindle poles/microtubules; Marking points for 8c continued on next page....	Max 6 for similarities. <i>Allow clearly annotated diagrams.</i>	8 max

8c continued

8.	c	k. in plant cells spindle fibres attach to walls; l. in animal cells, the plasma membrane is pulled inwards around the equator to form a cleavage furrow in cytokinesis OR in animal cells actin and myosin pinch cell membrane to split cytoplasm/cytokinesis; m. in plant cells a cell plate forms (at the equator) to develop into the new cell wall to achieve cytokinesis OR in plant cell vesicles (containing pectin) assemble sections of membrane/cell wall (at/across the equator) to achieve splitting/cytokinesis;		
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Question	Answers	Notes	Total
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8.	a	a. meiosis halves the chromosome number / allows production of haploid gametes/cells; b. fusion of gametes/fertilization doubles (the chromosome number) / $n + n = 2$; c. meiosis prevents chromosome number doubling/conserves the chromosome number (between generations); d. fusion of gametes brings together genes/alleles/chromosomes from two parents; e. meiosis breaks up combinations of alleles/genes / segregation of alleles OR meiosis generates variation by independent assortment/crossing over; f. fusion of gametes/fertilization/meiosis produces variation needed for natural selection/evolution/resilience/survivability/<i>OWTTE</i>;		4 max
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2225 – 6021

Question		Answers	Notes	Total
8.	b	a. DNA replication / DNA is duplicated/copied; b. during S-phase of interphase OR DNA polymerase replicates/makes new DNA strands; c. each chromosome with two identical/sister chromatids/DNA molecules after replication/at start of mitosis; d. cell cycle controlled by cyclins / checkpoints with control by cyclins; e. chromosomes/chromatids/DNA condenses/coils/supercoils (at the start of mitosis/in prophase); f. microtubules/spindle attaches to the kinetochores/centromeres (in metaphase) OR in metaphase chromosomes are lined up/aligned on equator; g. kinetochores shorten/remove tubulin from (spindle) microtubules; h. cohesin molecules (binding sister chromatids together) break OR centromeres divide; i. (sister) chromatids/chromosomes) pulled to (opposite) poles/ends/sides (in anaphase); j. nuclear membranes reform (in telophase); k. cytokinesis (at the end of mitosis); l. (mitosis/cell division/cytokinesis) produces two (daughter) cells with the same chromosome number as the original cell/maintains diploid chromosome number;		7 max

2225-6021

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Mark-scheme answers

Biology HL | Paper 1A | Nov 2025 TZ1 | Q19 | 1 marks

19. B

Biology HL | Paper 1A | Nov 2025 TZ3 | Q19 | 1 marks

19. A

Biology HL | Paper 1A | Specimen 2025 | Q23 | 1 marks

23. A