

APOLLO

Neural signalling SL

Biology

First assessment 2025

11 questions | mark schemes

Mark-scheme answers

Biology SL | Paper 1A | May 2025 TZ1 | Q17 | 1 marks

17. B

Biology SL | Paper 1A | May 2025 TZ3 | Q12 | 1 marks

12. D

3.	a	i	as axon diameter increases, the speed of transmission increases too / positive correlation/relationship;		1
3.	a	ii	a. R^2 is the coefficient of determination; b. R^2 compares variation between dependent and independent variables; c. R^2 represents the (percentage of) data that is closest to the line of best fit/regression line; d. $0.92/R^2$ is close to 1 / is highly significant; e. 92% of the variation in conduction velocity can be explained by variations in axon diameter;	e. 92% must be mentioned.	2 max
3.	b		sensory (neurons) transmit impulses to CNS/spinal cord/brain/interneurons while motor transmit away from CNS/spinal cord/brain/interneurons OR sensory receive impulses from sense organs/receptors while motor stimulate effectors/muscles/glands;	Accept an annotated diagram eg reflex arc with both neurons.	1 max
3.	c		a. ATP is stable/soluble in the cytoplasm; b. (ATP) stores/supplies energy / is energy currency; c. when ATP is converted to ADP / a phosphate group is released (from ATP); d. <u>hydrolysis</u> produces ADP; e. the small amounts of energy involved means little energy is wasted; f. ATP is easily/rapidly regenerated (from ADP and P);		3 max

Question	Answers	Notes	Total
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3.	a	the neuron is insulated since it shows Schwann cells/myelin sheath can be seen;		1
3.	b	a. DNA/chromosomes; b. ribosomes; c. plasma/cell membrane/phospholipid bilayer; d. cytoplasm/cytosol;		2 max
3.	c	a. action potential/nerve impulse reaches the end of the presynaptic neuron; b. impulse/action potential/depolarization of the (presynaptic) membrane causes calcium (ions)/Ca ²⁺ uptake/diffusion into the neuron; c. (calcium ions) cause vesicles to move to the (presynaptic) membrane; d. vesicles contain neurotransmitter; e. neurotransmitter released into the synaptic gap/cleft by exocytosis/when vesicle fuses with membrane;		3 max

Question	Answers	Notes	Total
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6.	a		a. dendrite; b. receives impulse/signals/neurotransmitter from (adjacent) neuron OR conducts/passes impulses/signals towards cell body/neuron;		2 max
6.	b		a. calcium/ Ca^{2+} /Ca moves into the presynaptic membrane OR neurotransmitter/acetylcholine released from presynaptic membrane; b. (neurotransmitter) diffuses across the synapse/synaptic cleft; c. binds to transmembrane receptors/receptors in postsynaptic membrane; d. (protein) channels open/ Na^{+} /positive ions diffuse in; e. causes depolarization (of (post synaptic) membrane) / action potential / membrane potential increases;		3 max

Mark-scheme answers

Biology SL | Paper 1A | Nov 2025 TZ1 | Q11 | 1 marks

11. A

Biology SL | Paper 1A | Nov 2025 TZ1 | Q16 | 1 marks

16. D

Biology SL | Paper 1A | Nov 2025 TZ3 | Q11 | 1 marks

11. C

Biology SL | Paper 1A | Nov 2025 TZ3 | Q17 | 1 marks

17. C

5.	a	neurotransmitter/acetylcholine/another verified example of neurotransmitter;		1
5.	b	a. (only) pre-synaptic membrane has calcium channels/allows calcium to diffuse across OR (only) pre-synaptic membrane releases neurotransmitters from their axon terminals; b. (only) post-synaptic membrane has receptors for neurotransmitter OR (only) accept neurotransmitter in their dendrites/post-synaptic membrane; c. the presynaptic membrane is at the axon terminal, but the post synaptic membrane is at a dendrite;	<i>Accept other verified differences.</i>	2 max
5.	c	short distance for diffusion of neurotransmitter; synaptic transmission is faster;		1 max

Mark-scheme answers

Biology SL | Paper 1A | Specimen 2025 | Q13 | 1 marks

13. B