



EXAM PAPERS PRACTICE

Question Number	Answer	Acceptable answers	Mark
1(a)(i)	nucleus (1)		(1)

Question Number	Answer	Acceptable answers	Mark
1(a)(ii)	C In DNA, the bases A - T are complementary		(1)

Question Number	Answer	Acceptable answers	Mark
1(b)	A definition including two of the following: <ul style="list-style-type: none">• a sperm fuses with egg / penetrates the egg (1)• nuclei/genetic information fuses /combines (1)• reference to haploid gametes /gametes have 23 chromosomes (1)• reference to cell made being diploid / has 23 pairs of chromosomes / zygote formed (1)	Ignore sperm meets egg	(2)

Question Number	Answer	Acceptable answers	Mark
1(c)(i)	A description that includes the following: <ul style="list-style-type: none">• (aerobic) respiration / using glucose / using oxygen (1)• energy released (for movement / swimming / metabolism)(1)		(2)



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Question Number	Answer	Acceptable answers	Mark
1(c)(ii)	An explanation including two of the following: <ul style="list-style-type: none">• a change in a base/base sequence/order of bases / a change in mRNA (1)• named change e.g. addition/deletion (1)• reference to change in an amino acid / order of amino acids (1)	Accept codon, triplet, genetic code for base. substitution/deletion/other named gene mutation.	(2)

(Total for question 1 = 8 marks)



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Question Number	Answer	Acceptable answers	Mark
2a (i)	B – the glucose content of their blood		(1)

Question Number	Answer	Acceptable answers	Mark
2a (ii)	An explanation linking three of the following points: <ul style="list-style-type: none">• (the hormone) insulin (1)• (insulin)is injected (into subcutaneous fat) (1)• use a low carbohydrate /healthy diet (1)• (increase) exercise (1)• to lower blood glucose levels / when blood glucose levels get too high / regulate glucose levels(1)	use of epipen	(3)

Question Number	Answer	Acceptable answers	Mark
2b	Body Mass Index calculation: $120/1.8^2$ (1) 37 (1)	ecf for correct manipulation with incorrect figures	(2)



Question Number	Indicative Content		Mark
QWC *2(c)	An explanation including the following points in a logical order: <ul style="list-style-type: none">• a reflex response is an involuntary response• reflex responses do not involve the brain• reflex responses involve sensory neurones• reflex responses involve relay neurones• reflex responses involve motor neurones• relay neurones are in the spinal cord• impulses travel along neurones as electrical signals• the axon is insulated by the myelin sheath• which ensures the electrical signal does not lose energy• at the junction between two neurones there is a synapse• the message is carried across the synapse by neurotransmitters• the message travels from the stimulus along the axon and dendron of the sensory neurone to the spinal cord• the reflex arc is important to keep the body safe		(6)
Level		No rewardable content	
1	1-2	<ul style="list-style-type: none">• A limited written explanation of some of the neurones involved in the reflex arc or a limited explanation of how messages /impulses are transmitted as electrical signals• the answer communicates ideas using simple language and uses limited scientific terminology• spelling, punctuation and grammar are used with limited accuracy	
2	3-4	<ul style="list-style-type: none">• A simple explanation of the neurones involved in the reflex arc in the correct order, with the method of transmission along neurones, one neurone may be missing or a detailed description of all of the neurones in the reflex arc and the role of the CNS• the answer communicates ideas showing some evidence of clarity and organisation and mostly uses scientific terminology appropriately• spelling, punctuation and grammar are used with some accuracy	
3	5-6	<ul style="list-style-type: none">• A detailed explanation of the neurones involved in the reflex arc in the correct order, with the method of transmission along neurones including the role of the synapse and/or myelin sheath.• the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately• spelling, punctuation and grammar are used with few errors	



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Question Number	Answer	Acceptable answers	Mark
3(a)(i)	A		(1)

Question Number	Answer	Acceptable answers	Mark
3(a)(ii)	A		(1)

Question Number	Answer	Acceptable answers	Mark
3(b)	<p>an explanation linking the following</p> <ul style="list-style-type: none">• from receptor (cells) / sense organ (1)• to the {brain / spinal cord / CNS / synapse / other neurone} (1)• as an <u>electrical</u> impulse (1)	<p>Accept named sense organ</p> <p><u>electrical</u> message/signal Ignore references to current</p>	(2)

Question Number	Answer	Acceptable answers	Mark
3(c)	<p>a description including two of the following</p> <ul style="list-style-type: none">• insulates (electrical signal) (1)• the axon (1)• speeds up the impulse (1)	<p>ignore protects / protection</p> <p>accept message / signal for impulse</p>	(2)



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Question Number	Answer	Acceptable answers	Mark
3(d)	<p>a description including three of the following</p> <ul style="list-style-type: none">• receptor cells (pick up a stimulus) (1)• sensory neurone sends a message to the spinal cord / relay neurone / CNS (1)• the message travels from the relay neurone / CNS / spinal cord to the motor neurone (1)• (this initiates a response) in the effector / muscle / gland (1)• message travels across synapse (by neurotransmitters) (1)	<p>accept the correct nerve pathway diagram for 3 marks</p> <p>accept nerve for neurone</p>	(3)



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Question Number	Answer	Acceptable answers	Mark
4(a)	A differentiate into any type of cell		(1)

Question Number	Answer	Acceptable answers	Mark
4(b)	<p>Any two structures from the list with at least one matched adaptation:</p> <p>Structures (maximum of 2)</p> <ul style="list-style-type: none">• biconcave shape (1)• no nucleus (1)• thin membrane (1)• flexible / small (1)• contains haemoglobin (1) <p>(matched) adaptation (maximum of 2)</p> <ul style="list-style-type: none">• large surface area / increase oxygen uptake (1)• to increase amount of haemoglobin / oxygen-carrying capacity (1)• so short distance for diffusion (1)• to get through capillaries (1)• to bind oxygen (1)		(3)

Question Number	Answer	Acceptable answers	Mark
4(c)	<p>A description including two of the following points</p> <ul style="list-style-type: none">• clotting / to seal a wound / scab formed (1)• stop bleeding (1)• prevent infection / entry of microbes (1)• fibrin (1)		(2)



Question Number		Indicative Content	Mark
QWC	*4d	<p>A comparison between mitosis and meiosis including</p> <p>Mitosis</p> <ul style="list-style-type: none">• (genetically) identical cells produced• two daughter cells• one division• diploid daughter cells• identical set of chromosomes• occurs in the formation of body cells• for growth and repair (of body tissues) <p>Meiosis</p> <ul style="list-style-type: none">• (genetically) non-identical cells• four daughter cells• 2 divisions• haploid daughter cells• half the number of chromosomes• occurs in the formation of gametes• for sexual reproduction• results in genetic variation	(6)
Level	0	No rewardable content	
1	1 - 2	<ul style="list-style-type: none">• a limited description including two points on either meiosis or mitosis there maybe confusion between the two but this does not negate the level• the answer communicates ideas using simple language and uses limited scientific terminology• spelling, punctuation and grammar are used with limited accuracy	
2	3 - 4	<ul style="list-style-type: none">• a simple description including one comparison of meiosis and mitosis or a detailed description of either mitosis or meiosis• the answer communicates ideas showing some evidence of clarity and organisation and uses scientific terminology appropriately• spelling, punctuation and grammar are used with some accuracy	
3	5 - 6	<ul style="list-style-type: none">• a detailed comparison of both meiosis and mitosis – at least two correct comparisons made• the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately• spelling, punctuation and grammar are used with few errors	



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Question number	Answer	Mark
5(a)(i)	B cell wall The only correct answer is B <i>A is not correct because X is not the cell membrane</i> <i>C is not correct because X is not the cytoplasm</i> <i>D is not correct because X is not the nucleus</i>	(1)

Question number	Answer	Mark
5(a)(ii)	(allows) movement / swim / motility	(1)

Question number	Answer	Additional guidance	Mark
5(a)(iii)	<ul style="list-style-type: none">(bacteria) have no nucleus / have chromosomal DNA / have a cell wall	accept converse for all differences	(1)



Question number	Answer	Mark
5(b)	<p>C diffusion</p> <p>The only correct answer is C</p> <p><i>A is not correct because oxygen does not move into and out of cells by transpiration</i></p> <p><i>B is not correct because oxygen does not move into and out of cells by active transport</i></p> <p><i>D is not correct because oxygen does not move into and out of cells by osmosis</i></p>	(1)

Question number	Answer	Additional guidance	Mark
5(c)	<p>Substitution</p> <p>500 x 0.04 (1)</p> <p>Evaluation</p> <p>20 (mm)</p>	<p>award two marks for correct answer with no working</p>	(2)

(Total for question 2 = 6 marks)