



Mark Scheme (Results)

Summer 2026

Pearson Edexcel International GCSE in Human Biology

4HB1/01

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General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

Question number	Answer	Notes	Marks												
1 (a) (i)	<table><tr><th>Function</th><th>Component</th></tr><tr><td>prevents scurvy</td><td>vitamin C;</td></tr><tr><td>needed in haemoglobin production</td><td>iron;</td></tr><tr><td>helps absorption of calcium</td><td>vitamin D;</td></tr><tr><td>needed in the production of eye pigment</td><td>vitamin A;</td></tr><tr><td>helps form bones</td><td>calcium;</td></tr></table>	Function	Component	prevents scurvy	vitamin C;	needed in haemoglobin production	iron;	helps absorption of calcium	vitamin D;	needed in the production of eye pigment	vitamin A;	helps form bones	calcium;	ALLOW any correct component IGNORE 'vitamins/minerals'	(5)
	Function	Component													
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(ii)	<ul style="list-style-type: none">protein;fat/lipid;carbohydrate/named example;	(3)													
(b)	<ul style="list-style-type: none">all the necessary/essential/needed/types of components/food;in correct amounts;	ACCEPT list of at least three components of the diet for first point	(2)												
			Total 10												

Question number	Answer	Notes	Marks
2 (a)	(i) alcohol/lactic acid;	ACCEPT any correct substance	(1)
	(ii) <ul style="list-style-type: none"> • <u>deamination</u>; • <u>excess</u> amino acids; • broken down/have nitrogen containing part/amine group, removed; 		(3)
	(iii) <ul style="list-style-type: none"> • bile production; • regulation of blood glucose/sugar levels/store glycogen; 	ACCEPT any correct process	(2)
(b)	(i) <ul style="list-style-type: none"> • $1 - 0.5 = 0.5$ (AU); • $1.6 \times 60 = 96$; • $0.5 \div 96 = 0.0052(1/08)/5.2(1/08) \times 10^{-3}$; 	ecf if not converted to minutes IGNORE any minus signs in front of answer	(3)
	(ii) any six from: <ul style="list-style-type: none"> • hydrogen peroxide into test /boiling tube; • place catalase/enzyme (solution) into tube; • place tubes into a water bath; • measure volume of gas evolved/number of bubbles; • at set times; • repeat for all temperatures; • using same volume/concentration of peroxide/catalase; 	ACCEPT beaker/conical flask	(6)
			Total 15

Question number	Answer	Notes	Marks
3 (a)	(i) any two from: <ul style="list-style-type: none"> • A = ultrafiltration; • high (blood/hydrostatic) pressure; • forces out, molecules/substances/fluid; 		(2)
	(ii) <ul style="list-style-type: none"> • B = reabsorption of glucose/glucose goes back into blood (stream); • active transport; 		(2)
	(iii) C = reabsorption of water/osmoregulation;		(1)
(b)	any five from: <ul style="list-style-type: none"> • increase in (blood/body) temperature/ decrease in water potential of blood/increased blood concentration, detected by hypothalamus; • increased/more sweating (occurs); • causes release of ADH; • from pituitary; • increases reabsorption of water (into the blood); • smaller volume/higher concentration of urine; 		(5)
(c)	(i) kidney/Bowman's capsule, disease/failure/infection/damage,/high (blood) pressure;		(1)
	(ii) <ul style="list-style-type: none"> • place a sample (of urine) in a test/boiling tube; • add biuret reagent; • lilac colour protein present; • blue colour protein absent; 	ACCEPT sodium hydroxide plus copper sulphate	(4)
			Total 15

Question number	Answer	Notes	Marks								
4 (a) (i)	A = dendrite; B = axon; C = myelin sheath;		(3)								
	(ii) <ul style="list-style-type: none">carries/transfers/transmits/passes/transport/sends, impulse/action potential;from CNS/relay neurone;to an effector/muscle/gland;	IGNORE electrical/signal ACCEPT effector	(3)								
	(iii) muscle contracts;		(1)								
(b)	any two from: <table><tr><th>Motor neurone</th><th>Sensory neurone</th></tr><tr><td>impulse to effector,/from CNS/brain/relay neurone</td><td>impulses, to CNS/brain/relay neurone/from receptor;</td></tr><tr><td>long axon</td><td>short axon;</td></tr><tr><td>cell body at end</td><td>cell body in middle/side;</td></tr></table>	Motor neurone	Sensory neurone	impulse to effector,/from CNS/brain/relay neurone	impulses, to CNS/brain/relay neurone/from receptor;	long axon	short axon;	cell body at end	cell body in middle/side;		(3)
Motor neurone	Sensory neurone										
impulse to effector,/from CNS/brain/relay neurone	impulses, to CNS/brain/relay neurone/from receptor;										
long axon	short axon;										
cell body at end	cell body in middle/side;										
(c)	speed = distance ÷ time; 0.25 ÷ 0.0045; 55.5(5)/55.56/55.6/56 metres per second;	ACCEPT correct answer for full marks if no working shown.	(3)								
			Total 13								

Question number	Answer	Notes	Marks
5 (a) (i)	D; (120) A, B, and C all give lower values which are incorrect		(1)
	(ii) any five from <ul style="list-style-type: none"> • systolic pressure is higher pressure; • generated by contraction/pumping of left ventricle; • diastolic pressure is lower pressure; • occurs when left ventricle/heart relaxes; • aorta/arteries recoil; • because elastic tissue present; • pressure higher in aorta because closer to heart; 	REJECT right vent	(5)
	(iii) any four from <ul style="list-style-type: none"> • (in capillaries) smooth flow/not pulsatile; • (in capillaries) no recoil/constriction of vessels; • as there is no elastic/muscle tissue; • low(er)/fall/reduction in pressure; • further from heart; • enables exchange/passing out of, molecules/substances/named molecules; 	ACCEPT reverse argument for arteries	(4)
(b)	<ul style="list-style-type: none"> • measure heartbeat at rest; • finger over wrist/neck,/use stethoscope/monitor/pulse meter; • count pulses for 15/60 seconds/one minute; • repeat after exercise; 		(4)
			Total 14

Question number	Answer	Notes	Marks
6 (a)	(i) any three from <ul style="list-style-type: none"> carrier females; allele/condition on X chromosome/passed on X chromosome; no carrier males; only males have condition/no females with condition; 	only carrier females = 2 marks	(3)
	(ii) any two from: <ul style="list-style-type: none"> very few with condition; if it was dominant, females would be affected/not carriers/heterozygous/carriers would have the condition; skips a generation /AW; 		(2)
	(iii) <ul style="list-style-type: none"> male can only be $X^D Y$ because he doesn't have condition; female $X^D X^d$ as she is a carrier; <ul style="list-style-type: none"> offspring genotypes are $X^D X^D$ $X^D X^d$ $X^D Y$ $X^d Y$; phenotypes, unaffected female, carrier female, unaffected male, affected male <ul style="list-style-type: none"> 1 in 4/25%/0.25 chance; 	can use any letter for Duchenne allele but must have upper case for dominant and lower case for recessive ACCEPT Punnett square phenotypes must match genotypes	(5)
(b)	<ul style="list-style-type: none"> $70\,000\,000 \div 5000$; $= 14\,000$; 1.4×10^4; 		(3)
			Total 13

Question number	Answer	Notes	Marks
7 (a)	sexual intercourse;	ACCEPT correct alternatives	(1)
(b)	<ul style="list-style-type: none"> HIV is the organism/virus; AIDS is the name of the disease caused by the organism; 		(2)
(c) (i)	any three from: <ul style="list-style-type: none"> both infection and deaths decreased; by approximately the same amount; difference between the two numbers remains similar; reference to deaths increasing at 2017; number of people infected always greater than deaths; 		(3)
(ii)	<ul style="list-style-type: none"> greater awareness of causes/transmission; better treatment/healthcare; 	ALLOW examples e.g. use of condoms/sterile needles/any relevant example	(2)
(d)	<ul style="list-style-type: none"> only effective against bacteria/not effective against viruses; AIDS caused by a virus/HIV is a virus; 		(2)
			Total 10