Pearson Edexcel

Mark Scheme (Results)

Summer 2025

Pearson Edexcel International GCSE In Human Biology (4HB1) Paper 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	• antagonistic; • hinge; • biceps; • triceps; • tendons; • cartilage;		6
			6 marks

Question number	Answer	Notes	Marks
2 (a) (i)	X = (pentose) sugar/deoxyribose; Y = phosphate;	reject ribose reject phosphorus	2
(ii)	DNA/deoxyribonucleic acid;		1
(iii)	• double/two stranded; • thymine present; • only found in DNA (not RNA);		3
(iv)	nucleus;		1
(b) (i)	hydrogen bonds;		1
(ii)	• connect/hold/join, two strands/bases, together; • between complementary bases (pairs)/nucleotides; • adenine thymine/guanine cytosine;	ignore just A T G C	3
			11 marks

Question number	Answer	Notes	Marks
3 (a)	• control of/maintenance of • constant internal environment; • despite changes in external environment; • ref negative feedback;	ignore specific examples	4
(b)	box 1 hypothalamus; detects rise/increase in blood temperature; box 2 arterioles dilate/vasodilation; box 3 sweat evaporates; box 4 (more) heat loss (from skin); by radiation;	ignore thermoregulatory centre	6
(c)	• enzymes; • denatured; • fewer/no enzyme substrate complexes formed/substrate can't bind to active site/reduced <u>enzyme</u> activity/reaction; • reduced metabolic activity/rate of reactions in body reduced;		4
			14 marks

Question number	Answer	Notes	Marks
4 (a)	disease causing organism/micro-organism;		1
(b) (i)	any three from • cytoplasm; • cell/plasma membrane; • cell wall; • (loop of) nucleic acid/DNA; • flagellum;	if more than three parts labelled minus one mark for each incorrect label	3
(ii)	• distance between A and B = 64 mm/6.4 cm; • 64 × 1000 = 64 000 µm; • magnification = $\frac{64\,000}{2}$ = 32 000;	ecf allow +/- 1 mm	3
(c) (i)	• suitable scale, axes labelled with units; • correct way round; • points plotted correctly; • lines joining plotted points; • key to identify lines;	needs to cover half of paper award mp1,2 and 5 if bar chart plotted	5
(ii)	any three from • both fall/vaccine becomes less effective over time; • 45-64 years more effective (over all months)/over 65 less effective (over all months); • slowly for first two months; • more/ rapid /steep decrease, between 3-4 months/after month 3 (for over 65);		3
			15 marks

Question number	Answer	Notes	Marks
5 (a) (i)	A = sternum; B = rib(cage); C = intercostal muscle;	ignore external/internal	3
(ii)	• lungs; • diaphragm; • nose/trachea/bronchi/bronchus/bronchioles/alveoli;	in any order mark only first three	3
(iii)	• diaphragm flattens; • ribs move up and out; • by contraction of intercostal muscles; • volume of <u>thorax</u> increases; • pressure in thorax/lungs decreases; • air forced/rushes/sucked/drawn, in (from outside);	reject moves down ignore external/internal ignore air flows in	6
(b)	• $C_6H_{12}O_6 + 6O_2$; • $6CO_2 + 6H_2O$; • energy/ATP;		3
			15 marks

Question number	Answer	Notes	Marks
6 (a) (i)	any two from: • alcohol absorbed/passes into blood; • rapidly/immediately/straight away/steep increase; • by stomach;	ignore intestines	2
(ii)	• (alcohol carried to) liver; • broken down/detoxified; • level (in blood) falls;		3
(b) (i)	• any time after (including) 2.4 hours/2 hours 24 mins;	allow a time of between 1-20 minutes	1
(ii)	• alcohol is a depressant; • slows reaction/increases reaction time; • drivers can't respond as quickly/less alert; • leads to accidents;		4
(c)	• collecting duct less permeable (in absence of ADH); • less water reabsorbed; • into blood; • volume of urine (therefore) increased/more urine produced; • and is more dilute/less concentrated;	accept ref fewer aquaporins/water channels	5
			15 marks

Question number	Answer	Notes	Marks
7 (a) (i)	any two from: • pressure falls because of fall in volume; • fluid drains from capillaries; • and into lymph vessels • further away from heart ; • larger cross sectional area; • increased resistance/friction; • lumen of vein large(er)/artery narrow(er);		2
(ii)	• stay in capillary; • too large to pass out;		2
(b)	• plasma in test tube; • add biuret reagent; • (blue to) lilac/purple; • shows presence of protein;	ORA for last two points linked to mp3	4
(c)	• arterial end 4 - 3.3 = 0.7kPa; • (net) flow out; • venous end 1.6 - 3.3 = -1.7kPa; • (net) flow in;		4
(d)	• volume of blood decreases/less blood; • blood pressure drops;		2
			14 marks

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