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Mark Scheme (Results)

Summer 2023

Pearson Edexcel International GCSE in Human Biology (4HB1) Paper 01R

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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.

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Question number	Answer	Notes	Marks
1 a	retina; tympanum; optic nerve; semi-circular canals; iris; cochlea;		6
b	• part of retina; • no rods/cones/light sensitive cells/can't see/where optic nerve leaves the eye;		2

Total 8 marks

Question number	Answer	Notes	Marks
2 (a)	• two bones; • coming together/meet;		2
(b) (i)	X = tibia; Y = femur;	reject tibula	2
(ii)	tendons • connects bone to muscle; • transmits force/pull; cartilage • reduces friction/shock absorber/cushions; • allows smooth movement;		2 2
(iii)	• ligament; • second /another muscle;		2

Total 10 marks

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Question number	Answer	Notes	Marks
3 (a) (i)	• 120 - 5; • = 115 mm Hg;	allow +/- 2 for each figure ECF	2
(ii)	A; (arteries) B/C/D are represented by other parts of the graph		1
(iii)	D; (veins) A/B/C are represented by other parts of the graph		1
(b)	any 5 from • heart; • (left) ventricle contracts; • forces blood out of heart/through aorta; • high pressure; • ventricle relaxes; • pressure falls;		5
(c)	• capillaries; • no pulse/fluctuations; • as no muscle/elastic tissue; • (blood only pushed along at) low pressure/pressure drops;		4

Total 13 marks

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Question number	Answer	Notes	Marks
4 (a)	• correct plots;;; • key/labels;		4
(b)	• correct components/nutrients/list of components min of five; • in correct amounts/proportions;		2
(c)	• 75: • 15 • = 5:1;	ECF	2
(d)	• contain protein • needed for growth/repair/,muscles/tissues; • area A girl has low(er) levels/area B girl has high(er) levels; • less/poor growth/area B girl good growth; • kwashiorkor;		5

Total 13 marks

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Question number	Answer	Notes	Marks
5 (a) (i)	any two from • to allow the heart rate to return to normal; • allow respiration/breathing rate/body temperature to return to normal; • to allow sweat to evaporate;		2
(ii)	any three from • same time for exercise; • same type/intensity of exercise; • wear same clothing for each test; • measure sweat from same area;		3
(b) (i)	• axes labelled with units with independent variable on x-axis; • suitable scale; • both sets of data plotted correctly;; • suitable lines; • lines labelled;		6
(ii)	any five from • exercise increases muscle activity; • more energy/ATP required; • increased respiration; • heat produced as by product; • lost from body; • by increased sweating; • increase in room temperature increases rate of sweating;		5

Total 16 marks

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Question number	Answer	Notes	Marks
6 (a)	• general shape with nucleus at centre; • nucleus labelled; • cytoplasm labelled; • cell membrane labelled;		4
(b)	• scrape/swab cells from (inside of) cheek • smear (thinly) over slide;/place sample on slide; • add stain/cover with coverslip;		3
(c)	• cheek cell shape irregular, trachea cell oblong; • cilia present in trachea, absent in cheek cell; • position of nucleus different;		3

Total 10 marks

Question number	Answer	Notes	Marks
7 (a) (i)	• when both present; • both (equally) expressed;		2
(ii)	• I^BI^O; • I^BI^B;		2
(b)	any four from • carried on X chromosome; • not expressed in heterozygotes/recessive; • can't have male carriers; • can only have female heterozygotes/carriers; • because only females can have 2X chromosomes • male XY/only one X chromosome;		4

Total 8 marks

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Question number	Answer	Notes	Marks
8 (a) (i)	A = flagellum; B = cell wall/capsule; C = nucleic acid/genetic material/bacterial chromosome/(loop of) DNA;		3 (grad)
(ii)	pathogen;		1 (cler)
(b) (i)	• produced by microorganism/bacteria/fungi; • kills bacteria;		2 (grad)
(ii)	A *no mark for giving X* • because larger clear zone; • antibiotic diffused from filter paper; • bacteria have been killed;		3 (exp)
(iii)	• filter paper without antibiotic; • bacterial growth unaffected/no clear zones; • if antibiotic is causing effect;		3 (exp)

Total 12 marks

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