Mark Scheme (Results)

Summer 2017

Pearson Edexcel International GCSE
in Human Biology (4HB0) Paper 02

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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	Accept	Reject	Marks
1 (a) (i)	B; Sun **The only correct answer is B** A is not correct because the grass is not the source of energy C is not correct because insects are not the source of energy D is not correct because water is not the source of energy			1
(ii)	grass → insects → shrew → snake OR grass → insects → mouse → snake	One mark for organisms in correct order. One mark for arrows in correct direction		2
(iii)	movement/excretion/egestion/respiration/heat/keeping warm/not all parts of organism eaten/digested;	Accept lost in faeces		1
(b)	A description including two from the following: • bacteria/microorganisms/decomposers / detritus feeders/fungi / saprophytes / saprobionts; • breakdown/decompose/digest/decay; • organic matter/named organic matter; • releasing nutrients into soil;			2 max

Question 1 total marks 6

Question number	Answer	Accept	Reject	Marks
2 (a) (i)	C increases/increases **The only correct answer is C** A is not correct because this does not show the volume of water lost in breathing and sweat during exercise B is not correct because this does not show the volume of water lost in breathing and sweat during exercise D is not correct because this does not show the volume of water lost in breathing and sweat during exercise			1
(ii)	An explanation including two of the following: • breathing faster/deeper/harder; • faster rate of (aerobic) respiration/more energy; • (more) lactic acid produced; • (more) water produced (from aerobic respiration/lactic acid breakdown);			2 max
(b) (i)	• X and Y axis fully labelled with correct units; • axes scales; • bars for each variable plotted correctly; • bars labelled/key added;	Max 3 marks for line graph		4

(ii)	smaller volume of urine lost on a hot day;	Reverse argument applies Ignore values quoted from table Ignore references to concentration		1
(iii)	An explanation including three from the following: On a hot day: • more water lost as sweat; • to cool (down the body); • more ADH produced; • more water reabsorbed; • into the blood;	Allow reverse argument		3 max 1
(iv)	person 3/3/three			
(v)	Any two from the following; • repeat (measurements); • ignore anomalous results; • calculate a mean/average; • use more people;	Ignore values 950/690/260 Ignore references to health, age, gender		2 max

Question 2 total marks 14

Question number	Answer	Accept	Reject	Marks
3 (a)	In the following order: • skin; • trachea/ windpipe/bronchi; • stomach; • antibiotics;	Ignore respiratory tract Accept named antibiotic		4
(b)	line drawn on syringe at 0.56 cm^3;	Reject if more than one line drawn		1
(c)	• effectiveness/to see if it works/different people respond differently/test effectiveness on people with different characteristics e.g. male/female; • to test for toxicity/side effects/name side effect/to see if it causes harm;			2

Question 3 total marks 7

Question number	Answer	Accept	Reject	Marks
4 (a) (i)	Insulin			1
(ii)	Any two from the following: • decreases levels; • converted to glycogen;			2 max
(b) (i)	Any three from the following: • level is always higher; • increases more rapidly/increases by a greater amount/comparison of peak values for both;	Allow reverse argument for non-diabetic Allow rises by 85/90mg per 100 cm^3 in diabetics whereas rises by 55mg per 100 cm^3 in non-diabetics/diabetic increases by 35/40 mg per 100 cm^3 <u>more</u>		3 max
(ii)	• until 1/1 ½ hours after a meal; • drops more slowly/returns to initial level more slowly; Any three from the following: • glucagon released; • from pancreas; • glycogen converted to glucose;	Ignore increase in blood glucose level		3 max

		• (glucose) released into blood (from the liver);			1
(c)	(i)	Any order carbon, hydrogen, oxygen;	Do not allow symbols		
	(ii)	• add Benedict's solution; • heat ; • brick-red (in the presence of glucose);	Allow orange/red/yellow/green		3

Question 4 total marks 13

Question number	Answer	Accept	Reject	Marks
5 (a) (i)	• arrow(s) on right side of heart; • in through vena cava and out of pulmonary artery;			2
(ii)	• W prevents backflow of blood; • X transports/receives blood from the lungs; • Y (contracts to) push blood out of aorta/artery/to body	Allow ensures blood flows in one direction		3
(b) (i)	Reduce chances of (graft/tissue) rejection;	Ignore agglutination		1
(ii)	A suggestion including three of the following: • atheroma/fatty deposit; • coronary artery blocked; • vein bypasses blockage; • blood flow through coronary artery/cardiac/heart muscle resumed; • oxygen delivered to heart/cardiac muscle;	Ignore blood flow to/through heart		3 max
(c) (i)	20 000 x $\frac{80}{100}$;	Ecf: Incorrect values in calculation but correct answer to their calculation = 1 mark		
	16 000;	Full marks for final correct answer without working.		2

(ii)	• (eat) less sugar/(saturated) fat/salt; • exercise; • no smoking; • no/little alcohol;	Ignore balanced/healthy diet		2 max

Question 5 total marks 13

Question number	Answer	Accept	Reject	Marks
6 (a)	(Stage A) telophase; (stage B) metaphase; (stage C) anaphase;			3
(b)	In the following order: B before C; C before A;			2
(c)	Any two from the following: • production of genetically identical (body) cells/clones; • that are diploid; • for growth/repair;			2 max

Question 6 total marks 7

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