

# Mark Scheme (Results)

June 2011

International GCSE

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.

**INTERNATIONAL GCSE HUMAN BIOLOGY 4HB0/02 – SUMMER 2011**

Question number	Answer	Notes	Marks
1 (a) (i)	three pieces correctly labelled;;; apparatus in correct sequence; (connect T piece to a short tube and a long tube)		4
	(ii) limewater/bicarbonate indicator;		1
	(iii) indicates presence of carbon dioxide; relevant colour change described;		2 max
	(iv) liquid in each flask; covering long arm of tube;		2
	(v) sterilise mouth piece/don't suck too hard;		1

**Total 10 Marks**

Question number	Answer	Notes	Marks
2 (a) (i)	always present (in population); at constant/low levels;		2
(ii)	in neck/throat; in front of trachea/windpipe;		2
(iii)	thyroxine;		1
(b)	higher the intake of iodine; lower incidence of goitre; ORA 1 mark for generic definition i.e. as one variable increases/decrease the other decreases/increases		2
2 (c)	levels of iodine were increased/taking iodine; still some goitres developed; 0.2%;		2 max

**Total 9 Marks**

Question number	Answer	Notes	Marks
3 (a) (i)	<p>carried on X chromosome; passed on to offspring/explanation as to why males are affected more than females;</p>		2
(ii)	<p>phenotype normal/blood clots normally/not affected by disease; (has dominant and) recessive alleles present;</p>		2
(b)	<p>prevent loss of blood; prevent entry of bacteria/pathogens;</p>		2
3 (c)	<p><math>X^H X^h</math>      <math>X^H Y</math>;</p> <p><math>(X^H) (X^h)</math>    <math>(X^H) (Y)</math>; <math>X^H X^H</math>    <math>X^H Y</math>    <math>X^h Y</math>      <math>X^H X^h</math>;</p> <p>normal female, normal male, haemophliac male, carrier female;</p>	<p>Accept consequential errors</p>	4

**Total 10 Marks**

Question number	Answer	Accept	Marks
4(a) (i)	8;		1
(ii)	$\frac{4}{32} \times 100$ ; 12.5/12 <sup>1</sup> %; (correct answer scores full marks without working)		2
(iii)	more fluoride in water of X; X visits dentist more often/better dental services; brushes teeth better/specific description of good dental hygiene; better diet;		3 max
(b)	Food left on teeth/trapped between teeth; bacteria use sugar/break down sugar; converts to acid; lactic; dissolves/erodes enamel;		4 max
4 (c)	molars/pre molars are ridged/larger surface area; food accumulates;	Accept Comments about ease of brushing Converse	2
(d)	32 teeth; not boys because they have fewer/20 teeth/no wisdom teeth/no large molars;		2

**Total 14 Marks**

Question number	Answer	Notes	Marks
5 (a)	Sulphur dioxide causes acid rain; which erodes buildings; destroys vegetation/kills pond life;  sulphur dioxide damages lungs; causes breathing difficulties; asthma;  carbon monoxide combines with haemoglobin; irreversibly; less oxygen transported; damage to nerve cells/brain;		7

**Total 7 Marks**

Question number	Answer	Notes	Marks
6 (a) (i)	1.3 per 1000 people/ $1.3/1000^{-1}$ ;		1
(ii)	Line or point drawn on graph		1
(c)	destroys cilia; accumulation of mucus; pathogens/bacteria not removed/lung infections;  emphysema; alveoli (walls) break down; less area for gaseous exchange;  bronchitis; gasping/wheezing; poor oxygenation of blood;	2 X 2 descriptions	4 max
6 (b)	smoking increases death rate; some people die even though they don't smoke; stopping smoking decreases death rate; longer stopped smoking greater decrease; nearly same as non-smokers after 25 years;		2 max
(d)	1mark for reason increase blood pressure/less oxygen to heart <u>muscle</u> ;  1 mark for explanation narrowing of <u>coronary</u> arteries; OWTTE		2

**Total 10 Marks**  
**PAPER TOTAL: 60 MARKS**





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