

# Mark Scheme (Results)

January 2012

International GCSE Human Biology  
(4HB0) Paper 02

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**INTERNATIONAL GCSE HUMAN BIOLOGY 4HB0 02 – JANUARY 2012**

Question number			Answer	Marks
1	a		A thermometer; B beaker; C tripod; Accept tripod stand, but not stand on its own	3
	b		Two from: Goggles/eye protection; Tongs/protective gloves/asbestos/heat mat; Tie hair back/roll sleeves up;	2
	c	i	27;	1
	c	ii	23;; One mark for 50 - answer to part i	2

**Total 8 marks**

Question number			Answer	Marks
2	a	i	Rises (with age); Until 18/35 or falls after 35;	1 1
		ii	More energy; For growth/development/protein synthesis (for the unborn baby) or to carry the baby;	2
	b		Two from: Reference to poorer growth; Reference to impaired repair; Kwashiorkor/swollen stomach; Problems with muscles/anaemia/weakened immune system;	2

**Total 6 marks**

Question number			Answer	Marks
3	a	i	higher;	1
		ii	Blood is flowing/moving; (Maintains) low concentration in blood;	2
	b	i	Right hand side level higher than before; Left hand side level lower than before;	1 1
		ii	Water;	1

**Total 6 marks**

Question number			Answer	Marks
4	a	i	Nucleus correctly labelled; Myelin sheath correctly labelled;	2
		ii	Arrow going away from the cell body;	1
	b		Insulin; Pancreas; Glucagon; Negative;	4
	c		fast blood; slow; short long;	1 1 1

**Total 10 mark**

Question number			Answer	Marks
5	a		Reliability;	1
	b	i	20;; One mark for 60 in working	1 1
		ii	18/attempt 2 at 8 mins;	1
		iii	Breathing rate increases with increased time of exercise; increase slows/levels off;	1 1
		iv	More energy needed (during exercise); More oxygen; Respiration; Increased carbon dioxide;	3 max
	c		Strengthens; (Heart) muscle;	1 1

**Total 11 mark**

Question number			Answer	Marks
6	a		C <sub>6</sub> H <sub>12</sub> O <sub>6</sub> ; 6CO <sub>2</sub> ; 6 H <sub>2</sub> O;	1 1 1
	b	i	limewater; turns cloudy; (also allow hydrogen carbonate)and turns yellow	1 1
		ii	Measure <u>volume</u> of gas collected; Use measuring cylinder/gas syringe or eq.;	1 1

**Total 7 marks**

Question number			Answer	Marks
7	a		Four from: Eutrophication; <u>More or excessive</u> plant/algae growth/algal bloom; Blocking out light; Increase in microorganisms (feeding on dead plants); Respiration; Decrease in oxygen; Fish die;	4
	b	i	Three from: Breakdown of sewage/organic material; To <u>harmless</u> inorganic material/nitrogen gas; Anaerobic bacteria/respiration; Production of methane; Aerobic bacteria/respiration; Activated sludge;	3
		ii	1 mark for control, e.g. temperature; 1 mark for explanation, e.g. bacteria grow at different rates at different temperatures;	2
		iii	Three from: Mutate to resistant form; Non-resistant bacteria are killed (by antibiotics); Only resistant bacteria survive; Go one to reproduce/pass on the (resistant) gene; Increase over time/several generations;	3

**Total 12 mark**  
**PAPER TOTAL: 60 MARKS**





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