



Mark Scheme (Results)

January 2012

International GCSE Human Biology
(4HB0) Paper 01

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INTERNATIONAL GCSE HUMAN BIOLOGY 4HB0 01 – JANUARY 2012

Question number	Answer	Marks
1 (a) (b) (c) (d) (e) (f) (g) (h) (i) (j)	C; A; B; B; B; D; B; C; B; C;	10

Total 10 marks

Question number	Answer	Marks
2 (a) (i)	A;	1
(ii)	B;	1
(iii)	F;	1
(iv)	D;	1
(v)	C;	1
(vi)	E;	1

Total 6 marks

Question number	Answer	Marks
3 (a) (i)	Ribs/ribcage;	1
(ii)	spinal nerve/cord; Reject spine	1
(iii)	muscle attachment/movement/blood cell formation/support;	1
(b)	stomach; liver; small intestine/duodenum/ileum; large intestine; spleen; pancreas; kidney; gall bladder; uterus; ovary; bladder;	4 max
(c)	diaphragm/Z contracts; (diaphragm) flattens; increases volume of thorax/chest cavity; decreases pressure; reason for air moving in e.g. pressure difference;	3 max

Total 10 marks

Question number	Answer					Marks																
4	(a)	(i)	blue black colour; Accept black on its own but not blue on its own		1																	
		(ii)	place powder in boiling tube; Accept test tube dissolve in water; add Benedict's solution; heat/boil; in water bath; observe colour at end / observe or describe correct colour change;		3 max																	
		(iii)	use of goggles/protective gloves;		1																	
	(b)	<table><tr><td>Test</td><td>Powder A</td><td>Powder B</td><td>Powder C</td><td>Powder D</td></tr><tr><td>Iodine</td><td>yellow/brown</td><td>blue black</td><td>blue black</td><td>yellow/brown</td></tr><tr><td>Benedict's</td><td>blue</td><td>brick red</td><td>blue</td><td>brick red</td></tr></table>					Test	Powder A	Powder B	Powder C	Powder D	Iodine	yellow/brown	blue black	blue black	yellow/brown	Benedict's	blue	brick red	blue	brick red	5
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		Benedict's	blue	brick red	blue	brick red																
	(one mark for each correct column)																					
	(c)	(i)	A;		1																	
		(ii)	D;		1																	
(iii)		C;		1																		
(iv)		B		1																		

Total 14 marks

Question number	Answer	Marks														
5	<table><tr><th>Description of substance</th><th>Name of substance</th></tr><tr><td>excreted by the lungs</td><td><i>carbon dioxide;</i></td></tr><tr><td>nitrogen-containing compound excreted by the kidneys</td><td><i>urea;</i> Reject urine</td></tr><tr><td>used in temperature regulation</td><td><i>sweat;</i></td></tr><tr><td>produced during respiration</td><td><i>carbon dioxide;</i></td></tr><tr><td>formed in the large intestine</td><td><i>faeces;</i></td></tr><tr><td>formed by filtration and reabsorption</td><td><i>urine;</i></td></tr></table>	Description of substance	Name of substance	excreted by the lungs	<i>carbon dioxide;</i>	nitrogen-containing compound excreted by the kidneys	<i>urea;</i> Reject urine	used in temperature regulation	<i>sweat;</i>	produced during respiration	<i>carbon dioxide;</i>	formed in the large intestine	<i>faeces;</i>	formed by filtration and reabsorption	<i>urine;</i>	
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Total 6 marks

Question number	Answer	Marks
6 (a) (i)	circle around: legs; hairs; feet; proboscis;	3 max
	(ii) Typhoid/food poisoning/polio;	1
	(iii) cover food/place in a fridge; kill flies; (effective) treatment of sewage/sanitation; thorough cooking of food;	3 max
	(b) e.g. yoghurt making; cheese flavouring; sewage treatment; recycling nutrients; antibiotic manufacture; vinegar production	3 max

Total 10 marks

Question number	Answer	Marks
7 (a) (i)	sequence of nucleotides/section of DNA/part of a chromosome; give a particular characteristic/phenotype/feature; codes for amino acids; to produce protein/polypeptide;	2 max
(ii)	Hidden/not expressed; Unless homozygous/two present; Accept converse argument	2 max
(iii)	reduced/less oxygen transported; Reject no oxygen	1
(b) (i)	R r R r; RR Rr Rr rr;	2
(ii)	1:3/25%/1 in 4/1/4;	1
7 (c)	resistance to malaria; (People with the sickle cell allele) are better able to survive; and pass on allele;	2 max

Total 10 marks

Question number	Answer	Marks
8 (a)	taking sweet, sour, bitter and salt solutions taking individually; placed on the tongue; pieces of (filter) paper/cotton buds/pipette; soaked in one solution; held in forceps/tweezers; moved across tongue/test on each area of the tongue; washing out mouth between tastings; description of fair testing;	4 max
(b) (i)	back;	1
(ii)	front;	1
8 (c)	middle; lowest numbers;	2
(d)	more reliable results; children are different;	2

Total 10 marks

Question number	Answer	Marks
9 (a)	protein; enzyme	2
(b)	amylase has an optimum temperature at 40°C; (near) body temperature; denatured at 80°C Reject reference to enzyme dying	2
9 (c)	starch digested/broken down;	1
(d)	maltose; small molecule (so can pass through);	2
(e)	insufficient time for digestion of all starch / positive starch test would occur;	1
(f)	Mouth/salivary gland; duodenum/small intestine/pancreas;	2

Total 10 marks

Question number	Answer	Accept	Marks
10 (a)	(i) A ball and socket; B hinge;		2
	(ii) humerus;	Phonetically spelled	1
(b)	(i) position of biceps; tendons; (tendons) to radius and to scapula/humerus;		3
	(ii) contracts/shortens; tendons pull (bones);		2
10 (c)	(i) calcium;		1
	(ii) vitamin D formation; helps uptake/absorption of calcium ions;		2
	(iii) ultra-violet light; causes skin cancer; sunburn/heatstroke;		2 max

Total 13 marks

Question number	Answer	Marks
11 (a) (i)	C;	1
(ii)	excretory;	1
(b) (i)	ureter; Reject urethra Reject urinary tract	1
(ii)	vein; Ignore renal blood to heart/from organ; deoxygenated;	3
11 (c) (i)	62%/63%/64%/65%;	1
(ii)	10%//11%/12%/13%;	1
(iii)	A kidney machine at hospital; (Bar chart shows) because there are fewer people at work; Reference to actual data e.g. 36 +/- 2%; (Bar chart shows) because more unable to work; Reference to actual data e.g. 14 +/- 2%; (Bar chart shows) because more able to work but unemployed; Reference to actual data e.g. 28 +/- 2%;	4 max

Total 12 marks

Question number	Answer	Marks
12 (a)	liver;	1
(b) (i)	$(4 \times 15) + (5 \times 15) + (2 \times 15)$ 60 + 75 + 30 ; 165; mg; 165mg alone gains 3 marks	3
(ii)	no; over a period of three hours, body/liver breaks down 45mg; still leaves $120\text{mg}100\text{cm}^{-3}$ of blood; over legal limit/ $80\text{mg}100\text{cm}^{-3}$ (and unfit to drive);	4
(c)	cirrrosis/damage of liver/damage to brain;	1

Total 9 marks
PAPER TOTAL: 120 MARKS

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