

Mark Scheme (Results)

Summer 2012

International GCSE

Human Biology (4HB0) Paper 01

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**INTERNATIONAL GCSE HUMAN BIOLOGY PAPER 01 – SUMMER 2012**

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

**Total 10 marks**

Question number	Answer	Notes	Marks
2 (a) (i)	iris;	Reject pupil	1
	(ii) lens;		1
	(iii) choroid;		1
	(iv) fovea/yellow spot;		1
	(v) blind spot;		1
(b)	rays diverge from tree/parallel; refracted at cornea; refracted by lens; cross in vitreous humour/behind lens; inverted image on retina; arrows on rays on rays;		5 max

**Total 10 marks**

Question number	Answer			Notes	Marks	
3 (a)	Part of cell	Name of part	Function of part	Mark each point separately so if name is wrong can still get mark for correct function.  Reject controls activities	6	
A	cell membrane;	encloses cytoplasm/controls substances entering/leaving cell;				
B	nucleus;	controls chemical reactions/contains genetic material/DNA/chromosomes;				
C	cytoplasm;	site of chemical reactions;				
(b) (i)	mitochondria; endoplasmic reticulum; ribosomes; Golgi body; Nucleolus;			Reject starch granules	3 max	
(ii)	uses electrons, (not light); greater magnification/can see smaller objects; greater resolution;				2 max	
(c) (i)	sterilise skin/kill micro organisms/bacteria on skin;  prevent infection/can't introduce micro organisms/bacteria; see cells clearly/spread out cells; <u>white</u> cells/nuclei made easier to see;			Reject use of 'germs' once	4	
(ii)	risk of spread of disease/infection; e.g. AIDS/hepatitis; by transfer of pathogen/bacteria/micro organism;				2 max	
(d)	no nucleus; (bi)concave/larger surface area to volume ratio; haemoglobin present/carries oxygen;				3	

**Total 20 marks**

Question number	Answer	Notes	Marks
4 (a) (i)	2 <sup>1</sup> / <sub>2</sub> /2.5 (minutes);	Accept 2,5	1
(ii)	6.9; 5.9;		2
(iii)	22 <sup>1</sup> / <sub>2</sub> - 2 <sup>1</sup> / <sub>2</sub> ; 20 (minutes);	Award both marks for correct answer if no working shown.	2
(b)	bacteria in mouth breakdown/use/digest glucose; for respiration; acid/lactic acid produced; acid lowers pH;		3 max
(c) (i)	Add water to food; add Benedict's reagent; heat; change of colour (from blue) to brick red/red;		3
(ii)	use water bath/wear safety goggles;		1
(d) (i)	use fluoride toothpaste/fluoride in diet;		1
(ii)	high/pH above 5.5/alkaline (to kill bacteria);		1

**Total 14 marks**

Question number	Answer	Notes	Marks	
5	(a) (i)	faster walking more energy required; Steady/linear increase;	Accept correct ref to figures	2
	(ii)	energy used would be greater; at all speeds/for each speed;		2
	(b) (i)	aerobic; respiration;	2	
	(ii)	oxygen; water;	2	
	(c) (i)	diffuses from cell; carried in plasma; dissolved/as hydrogen carbonate ion; (diffuses) into alveoli; exhaled (from lungs);	Accept uses hydrogen carbonate indicator which turns red.	4 max
	(ii)	use limewater;  cloudy appearance (proves carbon dioxide);		2
	(iii)	cloudy more quickly; more carbon dioxide produced;		2 max

**Total 16 marks**

Question number	Answer	Notes	Marks
6	E; A; G; F;		1 1 1 1

**Total 4 marks**

Question number	Answer	Notes	Marks
7 (a)	thymine; cytosine; guanine;	Accept phonetic spellings Reject letters only	3
(b)	thymine;	Accept letter here if penalised in (a)	1

**Total 4 marks**

Question number	Answer			Notes	Marks
8	<i>Organism causing disease</i>	Name of disease	<i>Method by which disease is spread</i>	Reject answer if more than one is given.	6
	<i>Bacterium</i>	tuberculosis;	air;		
	<i>Virus</i>	polio;	water;		
	<i>Protozoan</i>	malaria;	vector;		

**Total 6 marks**



Question number	Answer	Notes	Marks
9 (a)	Bowman's capsule;		1
(b) (i)	protein is a large molecule/too large to filter; can't pass through walls of capillaries/glomerulus; none appears in filtrate;		2 max
(b) (ii)	0%/none present in urine; reabsorbed; all/100%; back into blood;		3 max
(c) (i)	liver;		1
(c) (ii)	increased loss of water by <u>sweating</u> ; secretion of (more) ADH increased permeability of collecting duct; more water reabsorbed; <u>concentration/%</u> of urea in urine increases;		4 max

**Total 11 marks**

Question number	Answer	Notes	Marks
10 (a) (ii)	pin/mounted needle used; subject/pupil blindfolded/looks away; so can't see when skin is touched; pupil reports when they can feel pin; repeat/use more than one person; appropriate example of fair testing e.g. same age/sex/use of same pin;		3 max
(i)	10; 4; 4;		3
(b)	more receptors; receptors closer together;		2

**Total 8 marks**

Question number	Answer	Notes	Marks
11 (a) (i)	85mm	Units required	1
(ii)	water passes from beaker into tubing;; by osmosis; down a water potential gradient/from low to high concentration; raising water level in capillary;		3 max
(b) (i)	crinkled appearance;		1
(ii)	water moves out of the cell by osmosis/down a water potential gradient/from low to high concentration; cell collapses/shrinks/flaccid;		2

**Total 7 marks**

Question number	Answer	Notes	Marks
12 (a) (i)	calcium/Ca /Ca <sup>2+</sup> ; phosphate/PO <sub>4</sub> <sup>-</sup> ;		2
(ii)	triceps muscle in correct position and correct size; attached to ulna; attachment to scapula/humerus;		3
(iii)	contraction of biceps; which is the antagonistic muscle; pulls on bones/forearm;		3
(b)	A has 360°/all round/three plane movement; B has 180°/one plane/up and down movement;		2

**Total 10 marks**

**PAPER TOTAL: 120 MARKS**



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