

Mark Scheme (Results)

Summer 2012

International GCSE

Human Biology (4HB0) Paper 01

## Edexcel and BTEC Qualifications

Edexcel and BTEC qualifications come from Pearson, the world's leading learning company. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information, please visit our website at [www.edexcel.com](http://www.edexcel.com).

Our website subject pages hold useful resources, support material and live feeds from our subject advisors giving you access to a portal of information. If you have any subject specific questions about this specification that require the help of a subject specialist, you may find our Ask The Expert email service helpful.

[www.edexcel.com/contactus](http://www.edexcel.com/contactus)

## Pearson: helping people progress, everywhere

Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for our commitment to high standards and raising achievement through innovation in education. Find out more about how we can help you and your students at: [www.pearson.com/uk](http://www.pearson.com/uk)

Summer 2012

Publications Code UG032507

All the material in this publication is copyright

© Pearson Education Ltd 2012

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
(ii)	0%/none present in urine; reabsorbed; all/100%; back into blood;		3 max
(c) (i)	liver;		1
(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 <sup>0</sup> /all round/three plane movement; B has 180 <sup>0</sup> /one plane/up and down movement;		2

Total 10 marks

PAPER TOTAL: 120 MARKS



Further copies of this publication are available from  
Edexcel Publications, Adamsway, Mansfield, Notts, NG18 4FN

Telephone 01623 467467

Fax 01623 450481

Email [publication.orders@edexcel.com](mailto:publication.orders@edexcel.com)

Order Code xxxxxxxx Summer 2012

For more information on Edexcel qualifications, please visit our website  
[www.edexcel.com](http://www.edexcel.com)

Pearson Education Limited. Registered company number 872828  
with its registered office at Edinburgh Gate, Harlow, Essex CM20 2JE

Ofqual  




Llywodraeth Cynulliad Cymru  
Welsh Assembly Government

