



Mark Scheme (Results)

January 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 call our GCE line on 0844 576 0025, our GCSE team on 0844 576 0027, or visit our qualifications website at www.edexcel.com. For information about our BTEC qualifications, please call 0844 576 0026, or visit our website at www.btec.co.uk.

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.

Ask The Expert can be accessed online at the following link:

<http://www.edexcel.com/Aboutus/contact-us/>

Alternatively, you can speak directly to a subject specialist at Pearson about Edexcel qualifications on our dedicated Science telephone line: 0844 576 0037

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 raising achievement through innovation in education. Find out more about how we can help you and your students at: www.pearson.com/uk

January 2012

Publications Code UG030680

All the material in this publication is copyright

© Pearson Education Ltd 2012

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 border="1"> <thead> <tr> <th>Test</th> <th>Powder A</th> <th>Powder B</th> <th>Powder C</th> <th>Powder D</th> </tr> </thead> <tbody> <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> </tbody> </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
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													
	(one mark for each correct column)																
4 (c) (i)	A;	1															
(ii)	D;	1															
(iii)	C;	1															
(iv)	B	1															

Total 14 marks

Question number	Answer	Marks														
5	<table border="1"> <thead> <tr> <th>Description of substance</th> <th>Name of substance</th> </tr> </thead> <tbody> <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> </tbody> </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>	
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>															

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)	cirrhosis/damage of liver/damage to brain;	1

Total 9 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

Order Code xxxxxxxx January 2012

For more information on Edexcel qualifications, please visit
www.edexcel.com/quals

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

