

# Mark Scheme (Results)

January 2012

International GCSE Biology (4BI0)  
Paper 2B

## **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](http://www.edexcel.com). For information about our BTEC qualifications, please call 0844 576 0026, or visit our website at [www.btec.co.uk](http://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](http://www.pearson.com/uk)

January 2012

Publications Code UG030191

All the material in this publication is copyright

© Pearson Education Ltd 2012

**INTERNATIONAL GCSE BIOLOGY 4BIO 2B– JANUARY 2012**

Question number	Answer	Notes	Marks
1 (a)	low in fat / eq; heart disease / blocks blood vessels / eq; high in protein / amino acids; growth / repair / eq; ignore muscles		2
(b)	conserves snail / natural populations / less collected / eq;		1
(c)	spider(s);		1
(d)	calcium / phosphate;	allow if in list with other ions	1
(e) (i)	cannot digest/breakdown <u>cellulose</u> / <u>fibre</u> / <u>roughage</u> ; no absorption of <u>cellulose</u> / <u>fibre</u> / <u>roughage</u> ;  lack enzyme / cellulase; lack symbiotic organisms;	ignore converse	max 2
(ii)	70;; one for 2.8 in working		2
(f)	(more) (glucose) metabolism / (more) respiration;  heat loss / need to maintain body temperature / keep warm / eq;  more active / more movement;	ignore energy use / energy loss  allow converse for snails  allow converse for snails  allow converse for snails	2
(g)	humans + (select) desired characteristics (for breeding) / eq;	allow human terms such as you / we / farmers	1
(h)	(no) bacteria / microorganism / fungi / pathogen / infection / disease / parasites / eq;	ignore germs	1

**TOTAL 13 MARKS**

Question number	Answer	Notes	Marks
2	cell; egg / ovum / sex; mitosis; embryo; uterus / womb; surrogate;	allow (udder) cell  look carefully at spelling and reject meiosis	6

**TOTAL 6 MARKS**

Question number	Answer	Notes	Marks
3 (a)	within range of 1.7 to 1.8;;  allow one for 16 in working;		2
(b)	(different) gender; (different) body size / mass ; (different) age;  reason for differences in sweat production: eg hydration levels / (different) genes / (different) body temperature / metabolic rate / fitness / eq;  human error / error described;  (different) size of cotton wool / area in contact / placing / cotton wool moved / eq;  time delay before weighing;	ignore ref to clothing / environment / antiperspirant / intensity of exercise	2
(c)	A;		1
(d) (i)	more sweat / more perspiration / more evaporation ;  need to cool / maintain body temperature / thermoregulation / thermoregulatory centre / hypothalamus eq;	must give idea of more	2
(ii)	less evaporation / sweat can not disperse / eq; cannot cool / overheating / eq; more sweat;		max 2

**TOTAL 9 MARKS**

Question number	Answer	Notes	Marks
4 (a)	light (intensity); affects/alters/increases/decreases/changes CO <sub>2</sub> level / gas exchange / photosynthesis;		2
(b)	size / species of leaves / eq; volume/amount/concentration of indicator; temperature;	ignore ref to tube size / time / cork seal / humidity	max 2
4 (c)	control / allow (valid) comparison / see if indicator changes (with no leaf) / colour change due to leaf / see if gas exchange happens without the leaf / eq;		1
(d) (i)	photosynthesis / allow photosynthesis more than respiration;  less CO <sub>2</sub> / CO <sub>2</sub> absorbed / eq;	ignore photosynthesis and respiration unqualified  ignore ref to pH	2
(ii)	respiration / <u>no</u> photosynthesis; CO <sub>2</sub> released / more CO <sub>2</sub> / no CO <sub>2</sub> absorbed / eq;	ignore ref pH	2
(e) (i)	respiration equals photosynthesis / CO <sub>2</sub> in equals CO <sub>2</sub> out / eq;	ignore gas exchange	1
(ii)	<u>no leaf</u> ;	ignore empty tube / nothing in tube	1
(f)	limewater only shows increase in CO <sub>2</sub> / cannot show decrease in CO <sub>2</sub> / cannot show amount of CO <sub>2</sub> / eq;		1

**TOTAL 12 MARKS**

Question number	Answer	Notes	Marks
5 (a) (i)	pigeons/birds in middle; arrows correct;	ignore sun	2
(b) (i)	fewer pigeons more hawk success / eq;  less chance to see or spot hawk / less chance to warn / eq;	allow converse  ignore ref to distance	2
(ii)	<u>ciliary</u> muscle / <u>ciliary</u> body; contracts / eq; ignore constrict <u>suspensory</u> ligaments; slacken / relax / eq; lens; fat(ter) / thick(er) / wider / rounder / eq;	assume near but allow converse if ref to hawk far away  only accept words linked to width  ignore pupil / iris / radial circular muscles  eg do not award contract mark if ref to radial / circular	max 4
(iii)	digested / broken down / large to small molecules;  protease / pepsin / enzyme; amino acids / peptides;  HCl / acid / low pH;	allow ref to digestion break down anywhere  only allow the term enzyme if in stomach reject trypsin	max 3

**TOTAL 11 MARKS**

Question number	Answer	Notes	Marks
6 (a)	TT and tt;	accept symbols other than T or t	1
	T and t;	eg P and p	1
	Tt;	parent mark can only be awarded if dominant and recessive letters are the same eg TT and tt or AA and aa	1
	correct Punnett square = 3	TT and DD = 0	
(b) (i)	stop <u>cross-pollination</u> / stop cross-pollination described / pollen from one plant getting to different plant / eq;	allow transfer error (TE) for gametes and offspring	max 2
	Mendel did it himself / manual pollination / use brush / pollen from plant to (stigma) of plant / self-pollination described / eq;	if parent genotype wrong allow TE for gametes and offspring	
(ii)	isolate plants (in greenhouse) / keep plants apart / cover plant / keep insects/wind away; eq;	allow isolation idea if applied to group of plants	
	TT, Tt (Tt) and tt;	reject combinations of different letters eg T and D or T and d or T and S	1
	accept symbols other than T or t eg P and p		

Question number	Answer	Notes	Marks
6 (c)	T / always expressed / expressed in heterozygote / expressed in homozygote and heterozygote / always shown in phenotype / eq;	reject dominates over recessive	1
	(d)  both / two alleles / equal / eq; reject if reference to genes  expressed / contribute / shown / eq;  in heterozygote / phenotype / characteristic;  example described / intermediate phenotype described / eq;	reject weaker and stronger ignore dominant and recessive	max 2

**TOTAL 9 MARKS**

**PAPER TOTAL : 60 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 January 2012

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

