

# Mark Scheme (Results)

January 2012

International GCSE Biology (4BI0)  
Paper 2B

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



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

**TOTAL 9 MARKS**

**PAPER TOTAL : 60 MARKS**





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