



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 ₂ 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 ₂ / CO ₂ absorbed / eq;	ignore photosynthesis and respiration unqualified ignore ref to pH	2
(ii)	respiration / <u>no</u> photosynthesis; CO ₂ released / more CO ₂ / no CO ₂ absorbed / eq;	ignore ref pH	2
(e) (i)	respiration equals photosynthesis / CO ₂ in equals CO ₂ 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 ₂ / cannot show decrease in CO ₂ / cannot show amount of CO ₂ / 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 eg P and p	1
	T and t;		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 allow transfer error (TE) for gametes and offspring if parent genotype wrong allow TE for gametes and offspring	
(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;		max 2
(ii)	isolate plants (in greenhouse) / keep plants apart / cover plant / keep insects/wind away; eq; TT, Tt (Tt) and tt; accept symbols other than T or t eg P and p	allow isolation idea if applied to group of plants reject combinations of different letters eg T and D or T and d or T and S	1

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)	<u>both</u> / <u>two alleles</u> / <u>equal</u> / 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

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