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# Mark Scheme (Results)

## January 2012

## International GCSE Biology (4BI0)
## Paper 2B

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**INTERNATIONAL GCSE BIOLOGY 4BI0 2B– JANUARY 2012**

| Question number | Answer | Notes | Marks |
|---|---|---|---|
| 1 (a) | low in fat / eq;<br>heart disease / blocks blood vessels / eq;<br>high in protein / amino acids;<br>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 cellulose / fibre / roughage;<br>no absorption of cellulose / fibre / roughage;<br><br>lack enzyme / cellulase;<br>lack symbiotic organisms; | ignore converse | max 2 |
| (ii) | 70;; one for 2.8 in working | | 2 |
| (f) | (more) (glucose) metabolism / (more) respiration;<br><br><br><br>heat loss / need to maintain body temperature / keep warm / eq;<br><br>more active / more movement; | ignore energy use / energy loss<br><br>allow converse for snails<br><br>allow converse for snails<br><br>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;<br>egg / ovum / sex;<br>mitosis;<br>embryo;<br>uterus / womb;<br>surrogate; | allow (udder) cell<br><br>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;;<br><br>allow one for 16 in working; | | 2 |
| (b) | (different) gender;<br>(different) body size / mass ;<br>(different) age;<br><br>reason for differences in sweat production: eg hydration levels /<br>(different) genes /<br>(different) body temperature / metabolic rate / fitness / eq;<br><br>human error / error described;<br><br>(different) size of cotton wool / area in contact / placing /<br>cotton wool moved / eq;<br><br>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 ;<br><br>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;<br>cannot cool / overheating / eq;<br>more sweat; | | max 2 |

**TOTAL 9 MARKS**

| Question number | Answer | Notes | Marks |
|---|---|---|---|
| **4** (a) | light (intensity);<br>affects/alters/increases/decreases/changes $CO_2$ level / gas exchange / photosynthesis; | | 2 |
| (b) | size / species of leaves / eq;<br>volume/amount/concentration of indicator;<br>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;<br><br>less $CO_2$ / $CO_2$ absorbed / eq; | ignore photosynthesis and respiration unqualified<br><br>ignore ref to pH | 2 |
| (ii) | respiration / <u>no</u> photosynthesis;<br>$CO_2$ 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;<br>arrows correct; | ignore sun | 2 |
| (b) (i) | fewer pigeons more hawk success / eq;<br><br>less chance to see or spot hawk / less chance to warn / eq; | allow converse<br><br>ignore ref to distance | 2 |
| (ii) | ciliary muscle / ciliary body;<br>contracts / eq; ignore constrict<br>suspensory ligaments;<br>slacken / relax / eq;<br>lens;<br>fat(ter) / thick(er) / wider / rounder / eq; | assume near but allow converse if ref to hawk far away<br><br>only accept words linked to width<br><br>ignore pupil / iris / radial circular muscles<br><br>eg do not award contract mark if ref to radial / circular | max 4 |
| (iii) | digested / broken down / large to small molecules;<br><br>protease / pepsin / enzyme;<br>amino acids / peptides;<br><br>HCl / acid / low pH; | allow ref to digestion break down anywhere<br><br>only allow the term enzyme if in stomach<br>reject trypsin | max 3 |

**TOTAL 11 MARKS**

| Question number | Answer | Notes | Marks |
|---|---|---|---|
| 6 (a) | TT and tt; | accept symbols other that 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 | |
| | | 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; | | max 2 |
| | 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; | allow isolation idea if applied to group of plants | |
| | eq; | | |
| (ii) | 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 that 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<br><br>expressed / contribute / shown / eq;<br><br>in heterozygote / phenotype / characteristic;<br><br>example described / intermediate phenotype described / eq; | reject weaker and stronger<br>ignore dominant and recessive | max 2 |

**TOTAL 9 MARKS**

**PAPER TOTAL : 60 MARKS**

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