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Mark Scheme (Results)

Summer 2012

GCSE Biology
5BI1F/01

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Summer 2012
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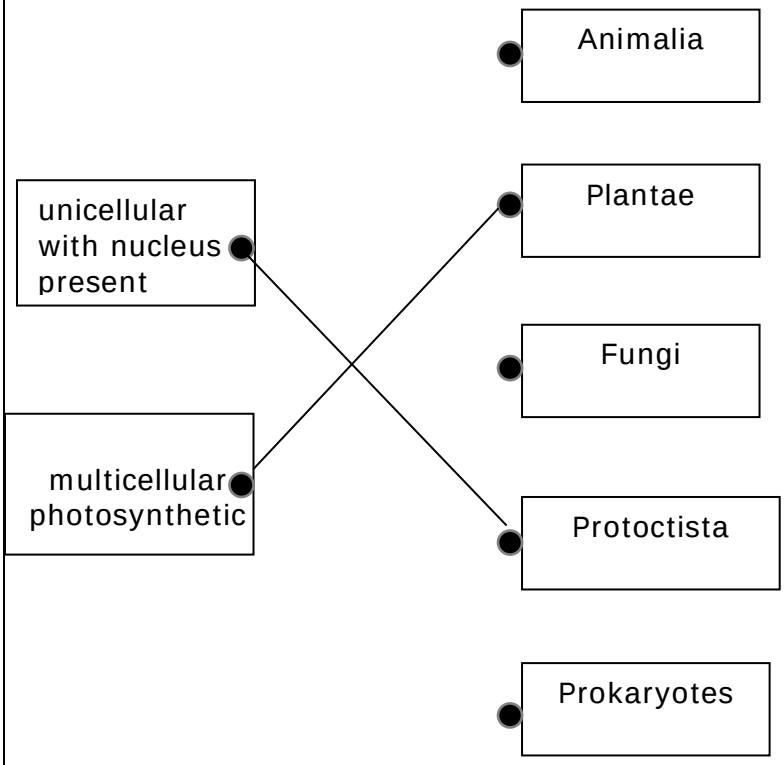
GCSE Biology 5BI1F/01 Mark Scheme – Summer 2012

Question Number	Answer	Acceptable answers	Mark
1(a)(i)	**D** species		**(1)**

Question Number	Answer	Acceptable answers	Mark
1(a)(ii)	Any **one** from the following points • supporting rod (1) • notochord (1) • spinal cord (1)	backbone / vertebrae / spine they are all vertebrates	**(1)**

Question Number	Answer	Acceptable answers	Mark
1(a)(iii)	An explanation to include two of the following points • reptiles use their environment (1) • mammals maintain body temperature from within (1) • reptiles are cold blooded (cannot control) AND mammals are warm blooded (can control) (1)	use the sun / shade thermoregulatory mechanism / named thermoregulatory mechanism e.g. sweat / shiver / insulation from fur	**(2)**

Question Number	Answer	Acceptable answers	Mark
1 (b)	 One mark for each correct line drawn from each left hand box Deduct each mark if more than one line is drawn from the left hand box		**(2)**

Question Number	Answer	Acceptable answers	Mark
1(c)	An explanation linking **two** of the following points • viruses are non-living (1) • viruses are not made up of cells (1) • viruses do not possess any cell organelles (1) • viruses rely upon a host to exist (1)	 viruses are not alive do not have cells a named process relying on host dependence	**(2)**

Question Number	Answer	Acceptable answers	Mark
2(a)(i)	**B** Martina: Churandy		**(1)**

Question Number	Answer	Acceptable answers	Mark
2(a)(ii)	Bolt: Usain		**(1)**

Question Number	Answer	Acceptable answers	Mark
2(a)(iii)	correct values selected (1) 10.03 and 9.69 evaluation (1) 0.34 (s)	 ECF give full marks for correct answer, no working	 **(2)**

Question Number	Answer	Acceptable answers	Mark
2(b)(i)	ear		**(1)**

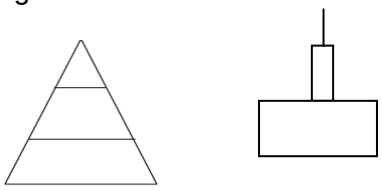
Question Number	Answer	Acceptable answers	Mark
2(b)(ii)	An explanation linking **three** of the following points • (impulse travels along) sensory neurone (1) • to the brain (1) • along relay neurone (1) • (impulse travels along) motor neurone (1) • to the muscle / effector (1) • reference to synapses (1)	 sensory / affector nerve to the spinal cord / CNS motor / effector nerve ignore reference to leg	 **(3)**

Question Number	Answer	Acceptable answers	Mark
3(a)(i)	**B** parasitism		**(1)**

Question Number	Answer	Acceptable answers	Mark
3(a)(ii)	photosynthesis		**(1)**

Question Number	Answer	Acceptable answers	Mark
3(b)(i)	A suggestion linking the following **collection** • the Mistle Thrush eats the seeds of the mistletoe plant / seeds stick to the Mistle Thrush (1) **transfer** • these are then egested / regurgitated / seeds deposited (onto the new trees) (1)	gathering nesting material excreted	**(2)**

Question Number	Answer	Acceptable answers	Mark
3 (b)(ii)	Substitution (200) ÷ (1000) (1) evaluation (answer X 100) = 20(%)(1)	If working shows division of any numbers from chain (1) give full marks for correct answer, no working	**(2)**

Question Number	Answer	Acceptable answers	Mark
3 (b)(iii)	• a pyramid which is pyramid shaped (1) • correct widths and same heights for each of the trophic levels (1)	ignore labels  correct area	**(2)**

Question Number	Answer	Acceptable answers	Mark
3 (b)(iv)	Any **two** of the following points • movement (1) • heat production (1) • excretion (1) • not all of the matter is digestible /egestion (1) • not all of the organism is eaten (1)	 flying respiration urine faeces	**(2)**

Question Number	Answer	Acceptable answers	Mark
4(a)(i)	400 (cm^3)		**(1)**

Question Number	Answer	Acceptable answers	Mark
4(a)(ii)	Any **one** of the following points • more urine produced on a cold day / ORA (1)	600 (cm^3)	**(1)**

Question Number	Answer	Acceptable answers	Mark
4(a)(iii)	An explanation linking **two** of the following points • water lost via sweating (1) • we sweat **<u>more</u>** (1) • maintain water levels of the body (1)	liquid / fluid lots of sweat dehydration reference / to keep hydrated	**(2)**

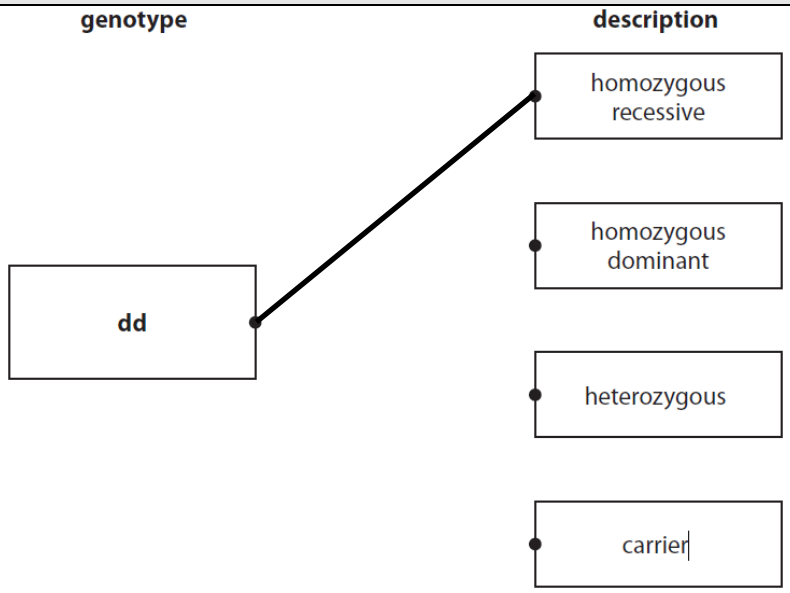
Question Number	Answer	Acceptable answers	Mark
4(b)(i)	**C** insulin		**(1)**

Question Number	Answer	Acceptable answers	Mark
4(b)(ii)	An explanation linking the following points • (glucose) converted into / stored as glycogen (1) • Liver / target cells (1)	 muscle / kidney / brain	 **(2)**

Question Number	Answer	Acceptable answers	Mark
4(b)(iii)	An explanation including **three** of the following points • injecting insulin (1) • into fat (1) • exercising (to use up excess blood glucose) (1) • controlling diet / control carbohydrate intake (1)	 insulin tablets / take insulin any named exercise glucose tablets	 **(3)**

Question Number	Answer	Acceptable answers	Mark
5(a)(i)	gene (1) alleles (1) Note: these MUST be in the correct order		**(2)**

Question Number	Answer	Acceptable answers	Mark
5(a)(ii)	**D** nucleus		**(1)**

Question Number	Answer	Acceptable answers	Mark
5(b)(i)	 one mark for correct line		**(1)**

Question Number	Answer	Acceptable answers	Mark
5(b)(ii)	A description including **two** of the following symptoms • will become tired (1) • shortness of breath (1) • painful joints (1)	weak (muscles) / tiredness / exhaustion breathing problems	**(2)**

<table>
<tr><th colspan="2">Question Number</th><th>Indicative Content</th><th>Mark</th></tr>
<tr><td>QWC</td><td>*5 (b) (iii)</td><td>
Punnett square showing the following gametes and offspring
Father gametes
<table>
<tr><td></td><td>D</td><td>D</td></tr>
<tr><td>d</td><td>Dd</td><td>Dd</td></tr>
<tr><td>d</td><td>Dd</td><td>Dd</td></tr>
</table>
Mother gametes

An explanation of the inheritance based on the Punnett square

parents will give one allele to the offspring
father can only give the dominant/D allele
mother will only give the recessive/d allele
a dominant and recessive allele will result in heterozygous offspring
offspring are all heterozygous
0% chance of offspring showing sickle cell disease phenotype
because the allele for no sickle cell disease is dominant over the recessive allele for sickle cell disease
all offspring are carriers for sickle cell disease
sickle cell disease is caused by 2 recessive alleles

</td><td>(6)</td></tr>
<tr><td>Level</td><td>0</td><td colspan="2">No rewardable content</td></tr>
<tr><td>1</td><td>1 - 2</td><td colspan="2">

one piece of correct information shown either in any genetic diagram or a written explanation e.g. “father has two dominant alleles”, “offspring are carriers”
the answer communicates ideas using simple language and uses limited scientific terminology
spelling, punctuation and grammar are used with limited accuracy

</td></tr>
<tr><td>2</td><td>3 - 4</td><td colspan="2">

correct genotype of offspring identified either in any genetic diagram or a written explanation
the answer communicates ideas showing some evidence of clarity and organisation and uses scientific terminology appropriately
spelling, punctuation and grammar are used with some accuracy

</td></tr>
<tr><td>3</td><td>5 - 6</td><td colspan="2">

a correct written explanation, which may include a genetic diagram, of why none of the children will have sickle cell disease
the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately
spelling, punctuation and grammar are used with few errors

</td></tr>
</table>

Question Number	Answer	Acceptable answers	Mark
6(a)(i)	**D** sulfur dioxide		**(1)**

Question Number	Answer	Acceptable answers	Mark
6(a)(ii)	A description including **two** of the following points • pollutant (1) • released into atmosphere (1) • dissolves with rain / water / water vapour (1) • forming sulfuric acid (1)	sulfur dioxide / nitrogen oxides / carbon dioxide cloud / air reacts / forms / mixes nitrogen oxides / nitrous acid / carbonic acid	**(2)**

Question Number	Answer	Acceptable answers	Mark
6 (a)(iii)	Any **one** from the following points • damage to aquatic environment • damage to soil environment • damage / erosion to buildings / statues / rocks / metals	damage / kills any named aquatic organism damage / kills plants / trees	**(1)**

Question Number	Answer	Acceptable answers	Mark
6 (b)	An explanation linking two of the following • reference to indicator species / organisms (1) • {bloodworm / red worm / sludgeworm} in polluted / dirty water (1) • {stonefly / mayfly / (freshwater) shrimp} in unpolluted /clean water (1)		**(2)**

Question Number		Indicative Content	Mark
QWC	***6 (c)**	An explanation of how eutrophication can cause problems in an aquatic environment including Occurs: • an overuse of nitrate fertiliser • leach / run into the aquatic environment • eutrophication is a build up of nitrates in an environment Problems: • this can cause an algal bloom • the algae will block the sunlight from the plants at the bottom of the lake/river • the plants at the bottom cannot photosynthesise • the plants on the bottom die and start to decompose • decomposers respire while decomposing the dead plants • the decomposers use the oxygen in the water • the water becomes anoxic • aquatic organisms such as fish will die • due to lack of oxygen	**(6)**
Level	**0**	No rewardable content	
1	**1 - 2**	• a limited explanation including one statement of how eutrophication occurs or the problems of eutrophication • the answer communicates ideas using simple language and uses limited scientific terminology • spelling, punctuation and grammar are used with limited accuracy	
2	**3 - 4**	• a simple explanation including two or more statements of how eutrophication occurs or the problems of eutrophication • some of the steps will be missing and not in a sequential order • the answer communicates ideas showing some evidence of clarity and organisation and uses scientific terminology appropriately • spelling, punctuation and grammar are used with some accuracy	
3	**5 - 6**	• a detailed explanation including three or more statements of how eutrophication occurs **and** some of the problems of eutrophication • the steps are identified and most are in a sequential order • the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately • spelling, punctuation and grammar are used with few errors	

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