Mark Scheme (Results)

Summer 2013

International GCSE
Biology (4BI0) Paper 2B

Edexcel Level 1/Level 2 Certificate
Biology (KBI0) Paper 2B

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Question number	Answer	Notes	Marks
1 (a)	adenine / thymine / guanine / cytosine;	ignore A, T, G and C	1
(b)	1 (kill) bacteria / (kill) pathogens / fungi / microbes / viruses / eq; 2 prevent disease / prevent infection / prevent spread of disease / prevent spread of infection; 3 affect growth (of explant) / (less) competition (for minerals);	allow remove bacteria / get rid of bacteria / eq	max 2
(c)	protein / enzymes / named protein;	ignore other molecules - DNA	1
(d)	organism / bacterium / virus / fungus that causes disease / infection;	ignore harm / illness	1
(e)	1 identical / clones / all same / no variation / eq; 2 large quantities / more / high yield / eq; 3 fast / faster / eq; 4 free from disease / free from pathogens / eq; 5 all year production / prevent extinction / eq;	ignore quality and characteristics being controlled ignore cost /cheaper ignore conservation	max 2

Question number	Answer	Notes	Marks
(f)	never runs out / renewable / can be replaced / can be grown again / unlimited supply / eq;	ignore never dies out ignore reproduced ignore reused	1
(g)	1 leaching / eutrophication / run off / eq; 2 soil erosion / flooding / eq; 3 rain(fall) / water cycle effect / less transpiration / drought / desertification / eq; 4 global warming / greenhouse (effect) / (more) CO_2 in air / less CO_2 removed / eq; 5 loss of medicinal plants / eq;	ignore extinction / food chain effect ignore loss of habitat ignore loss of species / less biodiversity ignore climate change ignore loss of wood resource ignore aesthetic appearance	max 3
		Total	**11**

<table>
<tr><th>Question number</th><th>Answer</th><th>Notes</th><th>Marks</th></tr>
<tr><td>2 (a)</td><td>
<table>
<tr><th>Description of stage</th><th>Name of stage</th></tr>
<tr><td>Heat from the sun causes liquid water to change into water vapour</td><td>evaporation</td></tr>
<tr><td>Water vapour in the air changes back into liquid water</td><td>condensation;</td></tr>
<tr><td>The liquid water falls to the earth</td><td>precipitation / rain(fall) / snow;</td></tr>
<tr><td>loss / evaporation / diffusion of water from leaves / plant / stomata;</td><td>transpiration</td></tr>
</table>
</td><td>ignore guard cells.

water loss and plant needed for the mark</td><td>3</td></tr>
</table>

Question number	Answer	Notes	Marks
2 (b)	1 (more) bacteria / fungi / microbes / microorganisms; 2 decomposition / decompose(rs); 3 respiration; 4 (less) oxygen; 5 fish die / animals die; 6 mineral ions / named mineral ion / nutrients; 7 plant growth / algal bloom / eq; 8 <u>eutrophication</u>;	ignore disease ignore plant death; ignore blocking light / less photosynthesis	4
		Total	**7**

Question number	Answer	Notes	Marks
3 (a) (i)	changed (by scientist) / altered (by student) / variable that is changed / eq;		1
(ii)	volume of water (collected) / water in cm^3;	allow amount of water ignore time taken / variable that is measured / volume of water added	1
(iii)	<table><tr><th>Variable</th><th>Tick</th></tr><tr><td>mass of dry soil</td><td>✓</td></tr><tr><td>size of measuring cylinder</td><td></td></tr><tr><td>volume of water collected</td><td></td></tr></table>		1
(iv)	7.1(428) / 7.14 / 7.143;	allow one mark for 7.142 or 14 in working	2
(v)	(A) (more) decimal places / hundredths / smaller scale interval / eq;	ignore milliseconds ignore digital ignore split seconds	1
(b) (i)	less water / water drains away / eq; less anchorage / eq;	ignore mineral ions	2
(ii)	(less) oxygen / not aerobic; active transport / active uptake; respiration / energy / ATP;	ignore ref to mineral ion or water concentration gradient or waterlogged	max 2
		Total	**10**

Question number	Answer	Notes	Marks
4 (a) (i)	same <u>alleles</u> / DD / dd / both dominant / both recessive / only one type of allele / eq;	ignore only one allele present allow other letters eg AA or aa. reject <u>genes</u>	1
(ii)	DD; Dd;		2
(b) (i)	mother DD and father dd; Dd and Dd;		2
(ii)	zero / 0(%) / no chance / 0 out of 2 / eq;	Allow any ratio 0:whatever	1
(c) (i)	22 800 000 / 22.8 million;	allow one mark for 12 or 0.12 in working	2
(ii)	not enough people tested / small sample / only 24 tested / chance / probability / eq;	ignore anomalous ignore human error	1
		Total	**9**

Question number	Answer	Notes	Marks
5 (a)	removal / eq; waste products of cells / metabolism / respiration / chemical reactions;	getting rid of toxic waste = 1 ignore toxic ignore examples such as CO_2 / urea MP2 reject if ref to egestion/faeces	2
(b) (i)	release <u>sweat</u> / <u>sweat</u>ing / eq; evaporation / eq; cooling / heat loss / eq;		3
(ii)	vasodilation / dilate / widen / expand / eq; (more) <u>blood</u> to skin/surface / <u>blood</u> near to skin/surface; cooling / heat loss / eq;	ignore names of blood vessels ignore vasoconstriction reject blood vessels moving	3
(c) (i)	lower blood glucose / lower blood sugar / eq; glycogen; liver / muscle;	must be stated converts glucose to glycogen = 1	max 2
(ii)	1 control water level / water regulation / osmoregulation / eq; 2 permeability / eq; 3 <u>collecting duct</u> 4 water reabsorption / water into blood / water into body / less waterloss from body / more concentrated urine / less urine / eq;		max 3
		Total	**13**

Question number	Answer	Notes	Marks
6 (a)	*Lactobacillus (bulgaricus) / Streptococcus (thermophilus)*;	ignore lactic acid bacteria	1
(b)	sterilise / kill / pasteurise; bacteria / microorganisms / pathogens / eq;	ignore get rid of ignore denature enzymes ignore taste / competition / contamination / disease	2
(c)	1 avoid killing *Lactobacillus* / bacteria / organisms (that make yoghurt); 2 optimum temperature; 3 enzymes; 4 (enzymes) denatured / destroyed;	ignore denature organism allow converse ignore make lactic acid / make yoghurt	2
(d)	(time) to make lactic acid; (warm) optimum temperature; enzymes; bacteria reproduction / bacteria growth / eq;		max 2
(e)	kills bacteria / stop growth of bacteria; low pH / more acid / acidic / lactic acid / eq; denatures/destroys enzymes / alters active site / eq;	allow microbes as eq to bacteria denatures bacteria = 1	3
		Total	**10**
		Total for paper	**60**

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