



Mark Scheme (Results)

Summer 2014

Pearson Edexcel GCSE in Biology
(5BI1H) Paper 01

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Question Number	Answer	Mark
1a(i)	A - bacterium	(1)

Question Number	Answer	Acceptable answers	Mark
1a(ii)	<p>A description to include two of the following points:</p> <p>Housefly carries a pathogen (1)</p> <p>housefly lands on (contaminated) faeces/animal waste (1)</p> <p>transfers dysentery /bacteria onto food (1)</p> <p>(infected) food eaten (1)</p>	<p>Ignore references to other types of disease transmission</p> <p>lands on food /infects the food</p>	(2)

Question Number	Answer	Acceptable answers	Mark
1a(iii)	<p>An explanation to include the following points:</p> <p><u>Hydrochloric acid</u> / <u>HCl</u>(1)</p> <p>in stomach (1)</p> <p>(acid) kills bacteria/ dysentery (1)</p>	<p>Both words needed for mark – stomach acid gets 1 mark for stomach.</p> <p>destroys/breaks down</p> <p>accept correct responses about antibodies/antitoxins for 1 mark</p>	(3)

Question Number	Answer	Acceptable answers	Mark
1 (b)	an explanation to include two of the following points: mosquito is a <u>vector</u> (1) carries protozoan/Plasmodium (1) pierces skin (1) transfers (protozoan/ <i>Plasmodium</i>) to blood (1)	Accept bites/injects/ sucks blood / feed on blood for pierces skin	(2)

(Total for question 1 = 8 marks)

Question Number	Answer	Acceptable answers	Mark
2(a)(i)	C Protocista		(1)

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

Question Number	Answer	Acceptable answers	Mark
2(a)(iii)	(both) contain chloroplasts / chlorophyll	Both can photosynthesise	(1)

Question Number	Answer	Acceptable answers	Mark
2(b)(i)	<p>An explanation linking 3 of the following points:</p> <ul style="list-style-type: none"> • autotrophs can make their own food (using sunlight) • heterotrophs eat other food • <i>Euglena</i> can make carbohydrates and/or eat carbohydrates • (so are) able to survive in different environments / survive in changing environments 	<p>autotrophs photosynthesise</p> <p>accept sugars/nutrients for carbohydrates</p>	(3)

Question Number	Answer	Acceptable answers	Mark
2(b)(ii)	A suggestion including two of the following points: <ul style="list-style-type: none">• publish findings in scientific journals• use the peer review process• attend scientific conferences	speak to other scientists	(2)

(Total for question 2 = 8 marks)

Question Number	Answer	Acceptable answers	Mark
3(a)(i)	C - positive gravitropism		(1)

Question Number	Answer	Acceptable answers	Mark
3(a)(ii)	<p>An explanation to include three of the following points:</p> <p>auxin (1)</p> <p>moves to / on the underside of the plant root (1)</p> <p>inhibits the elongation of root cells (on the underside of the root) (1)</p> <p>cells on upper side continue to elongate (1)</p> <p>making the root grow downwards (1)</p>	Grows towards gravity (1)	(3)

Question Number	Answer	Acceptable answers	Mark
3(a)(iii)	<p>A suggestion to include the following points</p> <p>anchor the plant /make plant stable (1)</p> <p>root can reach water / absorb water / access to mineral ions (1)</p>	Accept nutrients/named mineral ion/ mineral for mineral ions	(2)

Question Number	Answer	Acceptable answers	Mark
3(b)(i)	<p>A suggestion to include the following</p> <p>to see what the shoot should do under normal conditions /to compare the control results with the experimental results (1)</p>		(1)

Question Number	Answer	Acceptable answers	Mark
3 (b) (ii)	<p>A explanation to include three of the following:</p> <p>Rebecca's shoot did not curve and Andrew's shoot did curve (1)</p> <p>Rebecca's experiment (black cap will) does not allow light to shine on the tip (1)</p> <p>auxin / plant growth substance will not move (to shaded side of shoot) / is evenly distributed (1)</p> <p>Andrew's experiment</p> <p>jelly will allow auxin / plant growth substance to diffuse /move (through to shaded side) (1)</p> <p>causing cell elongation (1)</p>	<p>auxin is made/found in the tip</p>	<p>(3)</p>

(Total for question 3 = 10 marks)

Question Number	Answer	Acceptable answers	Mark
4(a)(i)	D sebaceous gland		(1)

Question Number	Answer	Acceptable answers	Mark
4(a)(ii)	<p>A description linking two of the following points:</p> <p>the sweat gland releases water / sweat onto (the surface of the skin) (1)</p> <p>the water evaporates (1)</p> <p>by removing heat from the surface of the skin / heat energy lost as latent heat(1)</p>	Accept cooling effect	(2)

Question Number	Answer	Acceptable answers	Mark
4(a)(iii)	<p>An explanation linking two of the following points:</p> <p>the (erector) muscle raises the hair (1)</p> <p>the hair traps air (next to the surface of the skin) (1)</p> <p>this acts as an insulator (1)</p> <p>causing more heat to be retained in the body (1)</p>	Ignore references to hair follicle standing up	(2)

Question Number	Answer	Acceptable answers	Mark
4(b)	A homeostasis		(1)

Question Number	Answer	Acceptable answers	Mark
4(c)	<p>An explanation linking two of the following points:</p> <p>this is the <u>optimum</u> temperature (1)</p> <p>involving enzymes (1)</p> <p>for chemical reactions in the body /metabolic reactions (1)</p> <p>denaturation occurs at higher temperatures / at lower temperatures reactions are slower (1)</p>	<p>Named chemical reactions e.g. digestion</p>	(2)

Question Number	Answer	Acceptable answers	Mark
4(d)	<p>An explanation linking two of the following points:</p> <p>reptiles are poikilothermic / ectothermic(1)</p> <p>they cannot generate heat to maintain their own body temperature (1)</p> <p>(so use the sun) to warm their bodies (1)</p> <p>for chemical reactions to occur (quickly) (1)</p>	<p>use the environment to control body temperature / internal temp is dependent on external temp</p>	(2)

(Total for question 4 = 10 marks)

Question Number	Answer	Acceptable answers	Mark
5a(i)	$\frac{(49 + 64 + 58)}{3}$ or $171 / 3 (1)$ $= 57$	Correct bald answer award 2 marks ecf applies if incorrect total is calculated but divided correctly by 3 for 1 mark	(2)

Question Number	Answer	Acceptable answers	Mark
5a(ii)	An explanation to linking four of the following points: nitrates leaked/leached into river (between the two sites) (1) causing eutrophication (1) algae block light to underwater plants / underwater plants cannot photosynthesise (1) (dead plants / algae) broken down by microorganisms (1) microorganisms respire (1) causing oxygen depletion / less oxygen available for the fish (1)	accept fertiliser for nitrates allow bacteria/decomposers	(4)

Question Number	Indicative Content	Mark
QWC	<p>*5(b) A description to include some of the following points</p> <ul style="list-style-type: none"> • indicator species used • number of indicator used as an assessment of pollution level <p>Water pollution – polluted</p> <ul style="list-style-type: none"> • bloodworms / sludgeworms /other named species • their presence signify high water pollution • they can survive in low oxygenated waters <p>Water pollution – clean</p> <ul style="list-style-type: none"> • freshwater shrimp / stonefly (larvae) / other named species • their presence signify low water pollution • they can only survive in areas of high oxygen (thus low pollution) <p>Air pollution</p> <ul style="list-style-type: none"> • blackspot fungus found on roses • blackspot fungus grows on roses in unpolluted areas because it is killed by the presence of sulfur dioxide that would be found in polluted air. • lichen – certain types of lichen can survive in polluted areas – so depending on the type of lichen found will be used to assess the pollution level of air 	(6) Exp
Level	0	No rewardable content
1	1 – 2	<ul style="list-style-type: none"> • a limited description of the use of indicator species no names of species needed • the answer communicates ideas using simple language and uses limited scientific terminology • spelling, punctuation and grammar are used with limited accuracy
2	3 – 4	<ul style="list-style-type: none"> • a simple description of the assessment of air or water pollution and the name/s of the species used with some idea of the level of pollution they respond to • 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	<ul style="list-style-type: none"> • a detailed description of the assessment of both air and water pollution and the names of indicator species with clear indication of polluted water and/or unpolluted water organisms as well as the response of lichen or blackspot fungus to sulphur dioxide • the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately • spelling, punctuation and grammar are used with few errors

(Total for question 5 = 12 mark)

Question Number	Answer	Acceptable answers	Mark
6(a)	Genus; Species;	Must be in the correct order	(2)

Question Number	Answer	Acceptable answers	Mark
6(b)	A suggestion including the following points: <ul style="list-style-type: none"> rats with the mutation survive to reproduce (1) pass on the allele which makes the offspring resistant to warfarin (1) 	accept breed / produce offspring etc for reproduce accept gene / mutation for allele	(2)

Question Number	Answer	Acceptable answers	Mark									
6(c)	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td>R</td> <td>r</td> </tr> <tr> <td>R</td> <td>RR</td> <td>Rr</td> </tr> <tr> <td>r</td> <td>Rr</td> <td>rr</td> </tr> </table> <p>Correct gametes (1) Correct offspring (1)</p>		R	r	R	RR	Rr	r	Rr	rr	If incorrect gametes are entered into the Punnett square but the offspring for those gametes are correct 1 mark can be awarded as an error carried forward	(2)
	R	r										
R	RR	Rr										
r	Rr	rr										

Question Number		Indicative Content	Mark
QWC	*6(d)	<p>A explanation to include some of the following points</p> <ul style="list-style-type: none"> • MRSA is a bacterial infection • number of cases increased from 1995 to 2006 • MRSA is resistant to antibiotics • so MRSA infection not easy to treat • number of cases were similar between 2005 and 2007 • antiseptics killed the bacteria • less bacteria were transferred from person to person • number of cases decreased from 2007 • antiseptics kill bacteria on surfaces • causing less infections from MRSA 	(6)
Level	0	No rewardable content	
1	1 – 2	<ul style="list-style-type: none"> • a limited explanation of the graph including correct data reading or the use of antiseptics or antibiotics to kill bacteria/treat MRSA • the answer communicates ideas using simple language and uses limited scientific terminology • spelling, punctuation and grammar are used with limited accuracy 	
2	3 – 4	<ul style="list-style-type: none"> • a simple explanation of one trend of the graph including correct data reading and the effect of the use of antiseptics or antibiotics to kill bacteria/treat MRSA • 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	<ul style="list-style-type: none"> • a detailed explanation of at least two trends of the graph linking it to antibiotic resistance and antiseptic programme • the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately • spelling, punctuation and grammar are used with few errors 	

(Total for question 6 = 12 marks)

Total for paper = 60 marks

