

Mark Scheme (Results)

Summer 2014

Pearson Edexcel GCSE in Biology  
(5BI1H) Paper 01

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Question Number	Answer	Mark
<b>1a(i)</b>	<b>A</b> - bacterium	<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>1a(ii)</b>	<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>	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>1a(iii)</b>	<p>An explanation to include the following points:</p> <p><u>Hydrochloric</u> acid / <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>	<b>(3)</b>

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

**(Total for question 1 = 8 marks)**

Question Number	Answer	Acceptable answers	Mark
<b>2(a)(i)</b>	<b>C</b> Protocista		<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>2(a)(ii)</b>	<b>D</b> nucleus		<b>(1)</b>

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

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

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

**(Total for question 2 = 8 marks)**

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

Question Number	Answer	Acceptable answers	Mark
<b>3(a)(ii)</b>	<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)	<b>(3)</b>

Question Number	Answer	Acceptable answers	Mark
<b>3(a)(iii)</b>	<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	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>3(b)(i)</b>	<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>		<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>3(b)(ii)</b>	<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><b>(3)</b></p>

**(Total for question 3 = 10 marks)**



Question Number	Answer	Acceptable answers	Mark
<b>4(a)(i)</b>	<b>D</b> sebaceous gland		<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>4(a)(ii)</b>	<p>A description linking <b>two</b> 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	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>4(a)(iii)</b>	<p>An explanation linking <b>two</b> of the following points:</p> <p>the (erector) muscle raises the hair (1)</p> <p>the hair traps <u>air</u> (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	<b>(2)</b>

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

Question Number	Answer	Acceptable answers	Mark
<b>4(c)</b>	<p>An explanation linking <b>two</b> 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>	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>4(d)</b>	<p>An explanation linking <b>two</b> 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>	<b>(2)</b>

**(Total for question 4 = 10 marks)**

Question Number	Answer	Acceptable answers	Mark
<b>5a(i)</b>	$\frac{(49 + 64 + 58)}{3}$ 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	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>5a(ii)</b>	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	<b>(4)</b>

Question Number		Indicative Content	Mark
<b>QWC</b>	<b>*5(b)</b>	<p>A description to include some of the following points</p> <ul style="list-style-type: none"> <li>• indicator species used</li> <li>• number of indicator used as an assessment of pollution level</li> </ul> <p>Water pollution – polluted</p> <ul style="list-style-type: none"> <li>• bloodworms / sludgeworms /other named species</li> <li>• their presence signify high water pollution</li> <li>• they can survive in low oxygenated waters</li> </ul> <p>Water pollution – clean</p> <ul style="list-style-type: none"> <li>• freshwater shrimp / stonefly (larvae) / other named species</li> <li>• their presence signify low water pollution</li> <li>• they can only survive in areas of high oxygen (thus low pollution)</li> </ul> <p>Air pollution</p> <ul style="list-style-type: none"> <li>• blackspot fungus found on roses</li> <li>• 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.</li> <li>• 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</li> </ul>	<b>(6) Exp</b>
<b>Level</b>	<b>0</b>	No rewardable content	
<b>1</b>	<b>1 – 2</b>	<ul style="list-style-type: none"> <li>• a limited description of the use of indicator species no names of species needed</li> <li>• the answer communicates ideas using simple language and uses limited scientific terminology</li> <li>• spelling, punctuation and grammar are used with limited accuracy</li> </ul>	
<b>2</b>	<b>3 – 4</b>	<ul style="list-style-type: none"> <li>• 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</li> <li>• the answer communicates ideas showing some evidence of clarity and organisation and uses scientific terminology appropriately</li> <li>• spelling, punctuation and grammar are used with some accuracy</li> </ul>	
<b>3</b>	<b>5 – 6</b>	<ul style="list-style-type: none"> <li>• 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</li> <li>• the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately</li> <li>• spelling, punctuation and grammar are used with few errors</li> </ul>	

**(Total for question 5 = 12 mark)**

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

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

Question Number	Answer	Acceptable answers	Mark									
<b>6(c)</b>	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td><b>R</b></td> <td><b>r</b></td> </tr> <tr> <td><b>R</b></td> <td><b>RR</b></td> <td><b>Rr</b></td> </tr> <tr> <td><b>r</b></td> <td><b>Rr</b></td> <td><b>rr</b></td> </tr> </table> <p>Correct gametes (1) Correct offspring (1)</p>		<b>R</b>	<b>r</b>	<b>R</b>	<b>RR</b>	<b>Rr</b>	<b>r</b>	<b>Rr</b>	<b>rr</b>	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	<b>(2)</b>
	<b>R</b>	<b>r</b>										
<b>R</b>	<b>RR</b>	<b>Rr</b>										
<b>r</b>	<b>Rr</b>	<b>rr</b>										

Question Number		Indicative Content	Mark
<b>QWC</b>	<b>*6(d)</b>	<p>A explanation to include some of the following points</p> <ul style="list-style-type: none"> <li>• MRSA is a bacterial infection</li> <li>• number of cases increased from 1995 to 2006</li> <li>• MRSA is resistant to antibiotics</li> <li>• so MRSA infection not easy to treat</li> <li>• number of cases were similar between 2005 and 2007</li> <li>• antiseptics killed the bacteria</li> <li>• less bacteria were transferred from person to person</li> <li>• number of cases decreased from 2007</li> <li>• antiseptics kill bacteria on surfaces</li> <li>• causing less infections from MRSA</li> </ul>	<b>(6)</b>
<b>Level</b>	<b>0</b>	No rewardable content	
<b>1</b>	<b>1 – 2</b>	<ul style="list-style-type: none"> <li>• a limited explanation of the graph including correct data reading or the use of antiseptics or antibiotics to kill bacteria/treat MRSA</li> <li>• the answer communicates ideas using simple language and uses limited scientific terminology</li> <li>• spelling, punctuation and grammar are used with limited accuracy</li> </ul>	
<b>2</b>	<b>3 – 4</b>	<ul style="list-style-type: none"> <li>• 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</li> <li>• the answer communicates ideas showing some evidence of clarity and organisation and uses scientific terminology appropriately</li> <li>• spelling, punctuation and grammar are used with some accuracy</li> </ul>	
<b>3</b>	<b>5 – 6</b>	<ul style="list-style-type: none"> <li>• a detailed explanation of at least two trends of the graph linking it to antibiotic resistance and antiseptic programme</li> <li>• the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately</li> <li>• spelling, punctuation and grammar are used with few errors</li> </ul>	

**(Total for question 6 = 12 marks)**

**Total for paper = 60 marks**

