

# Mark Scheme (Results)

March 2013

GCSE Biology  
5BI2F/01

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Question Number	Answer	Acceptable answers	Mark
<b>1(a)</b>	<p><b>enzyme</b></p> <p><b>molecule that the enzyme digests</b></p> <p>amylase ●</p> <p>lipase ●</p> <p>(1)</p> <p>● DNA</p> <p>● fat (1)</p> <p>● protein</p> <p>● starch</p>		<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>1(b)(i)</b>	<b>A</b> amino acids		<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>1(b)(ii)</b>	<b>B</b> pepsin has an optimum pH of 3		<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>1(b)(iii)</b>	<p>A description including two from the following points</p> <ul style="list-style-type: none"> <li>• pepsin has a lower activity</li> <li>• pepsin works at a lower pH</li> <li>• pepsin works within a narrower pH range</li> <li>• the optimum pH of pepsin is lower</li> </ul>	<p>ORA</p> <p>Accept: pepsin works in acidic conditions</p>	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>1(b)(iv)</b>	<p>A explanation linking the following points</p> <ul style="list-style-type: none"> <li>• it is less active/activity only 6 arbitrary units (1)</li> <li>• (starting to) denature (1)</li> <li>• active site is changing shape (1)</li> <li>• cannot bind to its substrate as well at this pH (1)</li> </ul>	<p>Accept: reference to pH9 being the optimum/pH11 is not the optimum</p>	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>2(a)(i)</b>	<b>B</b> - oligosaccharides		<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>2(b)(i)</b>	<ul style="list-style-type: none"> <li>• 15000 - 8000 (1)</li> <li>• 7000 (1)</li> </ul>	Accept: ecf - a sum that includes any value from 14200 to 15000 as alternative to 15000 minus 8000 and its correct answer e.g. $14200 - 8000 = 6200$ (1 maximum)  2 marks for correct bald answer	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>2(b)(ii)</b>	A description that includes:  increases number of useful bacteria	Ignore numbers	<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>2(c)(i)</b>	objective lens / eye piece lens	lens	<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>2(c)(ii)</b>	<p>A description including two of the following:</p> <ul style="list-style-type: none"> <li>• Image has more clarity/is more clear(1)</li> <li>• More detail can be seen(1)</li> <li>• Larger image can be seen(1)</li> </ul>	<p>Accept: more focussed</p> <p>Accept: named bacterial cell components</p> <p>Accept: idea of greater magnification</p>	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>2(c)(iii)</b>	<p>Any one of the following:</p> <ul style="list-style-type: none"> <li>• cell wall</li> <li>• flagellum</li> </ul>	<p>Accept: cell membrane</p> <p>Ignore: tail</p>	<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>3(a)(i)</b>	mitosis (1)	Do not accept meiosis or any word that sounds similar	<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>3(a)(ii)</b>	<b>B</b> - getting longer		<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>3(a)(iii)</b>	An description linking the following points <ul style="list-style-type: none"> <li>idea that cells are becoming specialised (1)</li> <li>to perform a specific function / eq (1)</li> <li>eg phloem, xylem, root hair cell (1)</li> </ul>		<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>3(b)(i)</b>	<ul style="list-style-type: none"> <li>total = 30.3 (1)</li> <li>mean = 10.1 (1)</li> </ul>	<p>2 marks for correct bald answer</p> <p>Accept: incorrect values in sum <math>\div 3 =</math> correct answer e.g. <math>(20.4 + 14.6 + 10.6) \div 3 = 15.2</math> (1 mark max)</p>	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>3(b)(ii)</b>	A suggestion including two from the following points <ul style="list-style-type: none"> <li>fertilisers increase plant height/growth (1)</li> <li>A has a greater effect than B/ A has a greater effect than C/ B has a greater effect than C (1)</li> <li>A has the greatest effect/C has the least effect (1)</li> </ul>	<p>Accept: Fertiliser A/B/C increases height/growth (1)</p> <p>ORA Accept: reference to compared figures/correct manipulation of figures (1)</p>	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>3(b)(iii)</b>	Any two from the following points <ul style="list-style-type: none"> <li>• shoot/stem diameter (1)</li> <li>• number of branches (1)</li> <li>• number of leaves/flowers (1)</li> <li>• length/surface area of leaves (1)</li> <li>• length of roots (1)</li> <li>• size of fruit (1)</li> <li>• number/yield of fruit (1)</li> </ul>	Accept: size of leaves  Accept: mass/dry mass/weight of plant/fruit (1)	<b>(2)</b>



Question Number	Answer	Acceptable answers	Mark
<b>4(a)(i)</b>	<p>A description that includes two of the following points</p> <ul style="list-style-type: none"> <li>• gametes produced (1)</li> <li>• haploid cells / half the number of chromosomes (1)</li> <li>• genetically different (1)</li> </ul>	<p>Accept: sex cells are produced Accept: 23 chromosomes</p>	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>4(a)(ii)</b>	<p>A description that includes two of the following points</p> <ul style="list-style-type: none"> <li>• idea that sperm and egg cell/gametes join (1)</li> <li>• genetic information combines (1)</li> <li>• zygote produced (1)</li> </ul>	<p>Accept sex cells join Accept: chromosomes/DNA combines Accept: diploid cell</p>	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>4(b)</b>	<p>Suggestions that include <b>one</b> advantage from</p> <ul style="list-style-type: none"> <li>• differentiate into any (body) cell</li> <li>• grow/repair tissues/ body organ / limb</li> <li>• for transplants</li> </ul> <p>and one disadvantage from</p> <ul style="list-style-type: none"> <li>• embryos are destroyed</li> <li>• can become cancerous</li> <li>• justified ethical issue e.g some people feel that embryo has a right to life</li> </ul>	<p>Accept: research cures/treatments for disease/named genetic disease/Parkinsons/cancer/diabetes</p>	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>4(c)(i)</b>	<p>A description that includes three of the following points</p> <ul style="list-style-type: none"> <li>• two strands (1)</li> <li>• double helix (1)</li> <li>• reference to bases (1)</li> <li>• A with T / G with C (1)</li> <li>• hydrogen bonds (1)</li> </ul>	<p>Accept: description e.g twisted ladder</p> <p>Accept: complimentary pairs</p>	<b>(3)</b>

Question Number	Answer	Acceptable answers	Mark
<b>(4)(c)(ii)</b>	<b>C</b> protein		<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>5(a)(i)</b>	<b>B</b> 80 cm <sup>3</sup>		<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>5(a)(ii)</b>	<p>A description that includes <b>two</b> of the following:</p> <ul style="list-style-type: none"> <li>• it increases from rest to low intensity (1)</li> <li>• low to moderate intensity stays the same (1)</li> <li>• increases from moderate (1)</li> <li>• reference to compared figures/correct manipulation of figures (1)</li> </ul>	<p>Accept: increases as exercise intensity increases (1)</p>	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>5(a)(iii)</b>	<p>A explanation that includes <b>three</b> of the following</p> <ul style="list-style-type: none"> <li>• (more) oxygen needed (1)</li> <li>• (more) glucose needed (1)</li> <li>• for (aerobic) respiration (1)</li> <li>• which releases (more) energy (1)</li> <li>• so that muscles can work for longer/harder (1)</li> </ul>	<p>Accept: reduce muscle fatigue/cramp</p> <p>Accept: to reduce build up of lactic acid (1) remove carbon dioxide/waste from cells (1) maintain body temperature (1)</p>	<b>(3)</b>

Question Number		Indicative Content	Mark
<b>QWC</b>	<b>*5(b)</b>	<p>An explanation including some of the following points in a logical sequence</p> <ul style="list-style-type: none"> <li>• two sides to prevent mixing of blood</li> <li>• left side deals with oxygenated blood</li> <li>• thicker wall of left ventricles</li> <li>• pump blood to body</li> <li>• right side deals with deoxygenated blood</li> <li>• pumps blood to lungs</li> <li>• muscular wall of ventricles which contract</li> <li>• atria receive blood</li> <li>• valves to prevent backflow</li> <li>• correct reference to (named) arteries/veins</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 explanation that links one structure to its function e.g. the right side pumps blood (to the lungs) OR the pulmonary vein takes blood into the heart.</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 that links two different structures in the heart to their function e.g. right ventricle pumps blood to the lungs AND atria receive blood</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 that covers most of the indicative content and that includes at least three different structures linked to their function</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>	

Question Number	Answer	Acceptable answers	Mark
<b>6(a)(i)</b>	<b>B</b>		<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>6(a)(ii)</b>	<p>A explanation that includes any two of the following points</p> <ul style="list-style-type: none"> <li>contains chloroplasts (1)</li> <li>containing chlorophyll (1)</li> <li>which absorb light energy (1)</li> </ul>		<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>6(b)(i)</b>	<ul style="list-style-type: none"> <li>Any value between 24 °C to 28°C</li> </ul>	units (°C) must be given	<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>6(b)(ii)</b>	<p>A description that includes two of the following:</p> <ul style="list-style-type: none"> <li>named limiting factor e.g water, carbon dioxide, light (1)</li> <li>described effect on rate of photosynthesis e.g (lower light intensity) lower rate of photosynthesis (1)</li> </ul>	ORA	<b>(2)</b>

Question Number		Indicative Content	Mark
<b>QWC</b>	<b>*6(c)</b>	<p>A description including some of the following points in a logical sequence</p> <ul style="list-style-type: none"> <li>• (water moves into) root hair cells</li> <li>• by osmosis</li> <li>• from a high concentration (of water)</li> <li>• to a low concentration (of water)</li> <li>• down a concentration gradient</li> <li>• through a partially permeable membrane</li> <li>• through xylem vessels</li> <li>• by capillary action</li> <li>• (into leaves) and out through the stomata</li> <li>• reference to transpiration/transpiration stream</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 description of how water enters the plant <b>OR</b> how water moves through the plant e.g. water goes into the roots from the soil <b>OR</b> water goes up the stem</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 that includes a reference to root hair cells <b>OR</b> xylem vessels <b>OR</b> osmosis in the correct context.</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 that includes a reference to root hair cells <b>AND</b> xylem vessels <b>AND</b> osmosis in the correct context.</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>	



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