



Mark Scheme (Results)

November 2012

GCSE Biology  
5BI2F/01

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## GCSE Biology 5BI2F/01 Mark Scheme – November 2012

Question Number	Answer	Acceptable answers	Mark
<b>1(a)</b>	<ul style="list-style-type: none"> <li>diploid (1)</li> <li>chromosomes (1)</li> <li>nucleus (1)</li> </ul> correct order		<b>(3)</b>

Question Number	Answer	Acceptable answers	Mark
<b>1(b)</b>	C – growth		<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>1(c)(i)</b>	An explanation including two of the following points <ul style="list-style-type: none"> <li>undifferentiated / unspecialised (cells) (1)</li> <li>can change into any type of (body) cell (1)</li> <li>can be used (in research) to grow new tissues/ repair damaged tissue / organs (for transplant)/for treatment/cure for genetic disease (1)</li> </ul>	Equivalent wording  Named example of body cell  Named genetic disease/valid disease e.g. Parkinson's/diabetes	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>1(c)(ii)</b>	<ul style="list-style-type: none"> <li>4 x 30 (1)</li> <li>120 (minutes) (1)</li> </ul>	Allow one mark for a given calculation that includes any number x30 = their correct answer e.g. 16 x 30 = 480  Bald answer 120 (minutes) (2)  Allow 2 hours <b>only</b> if units given	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>1(d)</b>	B - clones		<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>2ai</b>	D – produce a clear detailed image		<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>2(a)(ii)</b>	<ul style="list-style-type: none"> <li>• 0.005 x 400 (1)</li> <li>• 2 (mm) (1)</li> </ul>	Bald answer 2 (mm) (2)	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>2(b)</b>	(releases) energy	Reject: stores energy  Accept: (aerobic) respiration Reject: anaerobic respiration	<b>(1)</b>

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

Question Number	Answer	Acceptable answers	Mark
<b>2(c)(ii)</b>	A description including two of the following points <ul style="list-style-type: none"> <li>• chloroplasts contain chlorophyll (1)</li> <li>• which absorb (sun)light (1)</li> <li>• for photosynthesis (1)</li> <li>• to produce glucose/sugar (1)</li> </ul>	takes in/traps (sun) light  Accept: starch Ignore: food	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>3(a)(i)</b>	<p>A description including the following points</p> <ul style="list-style-type: none"> <li>• increases to midday/in the morning (1)</li> <li>• decreases from midday/ in the afternoon/to 6pm (1)</li> </ul>	<p>increases and then decreases (1)</p> <p>reference to highest rate around midday (1)</p>	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>3(a)(ii)</b>	<p>two of the following points</p> <ul style="list-style-type: none"> <li>• light (levels) (1)</li> <li>• temperature (1)</li> <li>• water (levels) (1)</li> <li>• carbon dioxide (concentration)(1)</li> </ul>	<p>mineral ion concentration</p> <p>cloudy</p> <p>too hot/cold</p> <p>Ignore: rain/weather</p> <p>Reject: (change of) seasons as 12 hour period in question</p>	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>3(a)(iii)</b>	<p>1 carbon dioxide/CO<sub>2</sub>;</p> <p>2 oxygen/O<sub>2</sub>;</p>	<p>Ignore: sunlight/light energy</p> <p>Reject: CO<sup>2</sup> or O<sup>2</sup> or any other variation in formulae from that given</p>	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>3(b)(i)</b>	<ul style="list-style-type: none"> <li>• 100 x 20 (1)</li> <li>• 2000 m<sup>2</sup> (1)</li> </ul>	Bald answer 2000 (m <sup>2</sup> ) (2)	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>3(b)(ii)</b>	<p>A description including any three of the following points</p> <ul style="list-style-type: none"> <li>• use a quadrat/select smaller area of the field (1)</li> <li>• place quadrat randomly/select areas randomly (1)</li> <li>• count the number of plants in each quadrat/location (1)</li> <li>• reference to use of several locations (1)</li> <li>• calculate average number of plants from quadrats/samples (1)</li> <li>• multiply sample size up to the total area of the field (1)</li> </ul>	<p>Accept: multiplied by 2000 m<sup>2</sup> (from 3bi)</p>	<b>(3)</b>

Question Number	Answer	Mark															
<b>4(a)(i)</b>	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">A</td> <td style="text-align: center;">T</td> <td style="text-align: center;">A</td> <td style="text-align: center;">G</td> <td style="text-align: center;">C</td> </tr> <tr> <td style="text-align: center;">⋮</td> <td style="text-align: center;">⋮</td> <td style="text-align: center;">⋮</td> <td style="text-align: center;">⋮</td> <td style="text-align: center;">⋮</td> </tr> <tr> <td style="text-align: center;">T</td> <td style="text-align: center;">A</td> <td style="text-align: center;">T</td> <td style="text-align: center;">C</td> <td style="text-align: center;">G</td> </tr> </table> <p>TAT (1) CG (1) Must be in correct order</p>	A	T	A	G	C	⋮	⋮	⋮	⋮	⋮	T	A	T	C	G	<b>(2)</b>
A	T	A	G	C													
⋮	⋮	⋮	⋮	⋮													
T	A	T	C	G													

Question Number	Answer	Acceptable answers	Mark
<b>4(a)(ii)</b>	(weak) hydrogen / H (bonds)		<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>4(b)(i)</b>	In any order: <ul style="list-style-type: none"> <li>• chromosomal (DNA) (1)</li> <li>• plasmid(s) (DNA) (1)</li> </ul>	circular (DNA) Ignore: circle/ring/chromosome(s) named plasmid	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>4(b)(ii)</b>	give instructions to make proteins	Accept controls activities /characteristics of the cell	<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>4(c)</b>	An explanation including any three of the following points  Protein may have: <ul style="list-style-type: none"> <li>• different amino acids (1)</li> <li>• different order of amino acids (1)</li> <li>• a different shape/structure (1)</li> <li>• a different function/not function correctly(1)</li> </ul>	References to change in active site (of enzymes)  Ignore: references to mutations (as in the question) Ignore: denaturing	<b>(3)</b>

Question Number	Answer	Acceptable answers	Mark
<b>5(a)(i)</b>	vein / vena cava	pulmonary vein Reject: pulmonary artery	<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>5(a)(ii)</b>	An explanation including any two of the following points <ul style="list-style-type: none"> <li>• <u>valves</u> (1)</li> <li>• between the atria and ventricles/in arteries leading away from heart (1)</li> <li>• (valves) only open one way</li> <li>• (valves) close (when blood flows backwards) (1)</li> </ul>	Accept: named valves  Ignore: prevents from flowing backwards (as in the question)	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>5(b)</b>	A suggestion including any two of the following points <ul style="list-style-type: none"> <li>• the heart has two sides/left and right side (1)</li> <li>• destination of blood from one side e.g. left side pumps to body (1)</li> <li>• type of blood from one side e.g. right side pumps deoxygenated blood(1)</li> </ul>	Accept: one side pumps blood to the body/lungs  Accept: one side pumps oxygenated/deoxygenated blood	<b>(2)</b>



Question Number		Indicative Content	Mark
<b>QWC</b>	<b>*5(c)</b>	<p>An explanation including some of the following points in a logical sequence</p> <ul style="list-style-type: none"> <li>• increased muscle contraction</li> <li>• blood is pumped faster around the body/to muscles</li> <li>• more oxygen/glucose delivered to cells/muscles</li> <li>• for aerobic respiration</li> <li>• which releases energy</li> <li>• rate of gas exchange increases</li> <li>• more carbon dioxide in the blood</li> <li>• more oxygen inhaled/into body</li> <li>• more carbon dioxide exhaled/from body</li> <li>• reduce build up of lactic acid</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 the reasons why heart or breathing rate increase with exercise e.g. blood flows faster or more oxygen is 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 that links an increase in heart rate with increased blood flow and an increase in breathing rate with increased oxygen uptake</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 linking an increase in heart rate AND breathing rate to an increase in blood flow and oxygen uptake. A link to aerobic respiration and/or energy demand is made.</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>5(d)</b>	B – lactic acid		<b>(1)</b>

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

Question Number	Answer	Acceptable answers	Mark
<b>6(a)(ii)</b>	<p>A description including any two from the following points</p> <ul style="list-style-type: none"> <li>• movement of food/peristalsis(1)</li> <li>• release of enzymes (1)</li> <li>• breakdown/digestion of food (1)</li> <li>• absorption/diffusion of small/soluble molecules (1)</li> <li>• into the blood (1)</li> </ul>	<p>named digestive enzymes named nutrients</p> <p>absorption/diffusion of food/nutrients</p>	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>6(b)</b>	<p>An explanation including three of the following points</p> <ul style="list-style-type: none"> <li>• amylase is an enzyme (1)</li> <li>• (amylase) breaks down/digests starch (1)</li> <li>• to maltose/sugar (1)</li> <li>• maltose/sugar is a small/soluble molecule (1)</li> <li>• (and can) diffuse through the wall of the visking tubing (1)</li> </ul>	<p>glucose for maltose/ sugar</p> <p>allow 'pass through' for diffusion</p>	<b>(3)</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> <p><b>mouth</b></p> <ul style="list-style-type: none"> <li>teeth chew food/break food down into smaller pieces</li> <li>increasing its surface area</li> <li>(and) mixes food with saliva so it can be swallowed more easily</li> <li>enzyme action in mouth / references to named enzymes?</li> <li>tongue helps to roll food into a ball/bolus (so it can be swallowed more easily)</li> </ul> <p><b>oesophagus</b></p> <ul style="list-style-type: none"> <li>swallowing</li> <li>muscular contractions/peristalsis in oesophagus</li> <li>pushes/moves food towards the stomach</li> </ul> <p><b>stomach</b></p> <ul style="list-style-type: none"> <li>contraction of muscle tissue in the stomach mixes food with acid and digestive juices</li> <li>enzyme action in stomach / references to named enzymes?</li> <li>hydrochloric acid contributes to the breakdown of food</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 which is likely to be restricted to one or two processes in one area only e.g. teeth chew food or saliva helps food to be swallowed.</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 describes one process in at least two areas e.g. food is chewed in the mouth and pushed down the oesophagus to the stomach.</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 describes most of the processes in at least two areas and includes the action of enzymes in the mouth or stomach</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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