

Mark Scheme (Results)

November 2012

GCSE Biology
5BI2F/01

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Publications Code UG034041

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

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

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

Question Number	Answer	Acceptable answers	Mark
1(c)(ii)	<ul style="list-style-type: none"> • 4 x 30 (1) • 120 (minutes) (1) 	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 only if units given	(2)

Question Number	Answer	Acceptable answers	Mark
1(d)	B - clones		(1)

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

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

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

Question Number	Answer	Acceptable answers	Mark
2(c)(i)	B - osmosis		(1)

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

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

Question Number	Answer	Acceptable answers	Mark
3(a)(ii)	<p>two of the following points</p> <ul style="list-style-type: none"> • light (levels) (1) • temperature (1) • water (levels) (1) • carbon dioxide (concentration)(1) 	<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>	(2)

Question Number	Answer	Acceptable answers	Mark
3(a)(iii)	<p>1 carbon dioxide/CO₂;</p> <p>2 oxygen/O₂;</p>	<p>Ignore: sunlight/light energy</p> <p>Reject: CO² or O² or any other variation in formulae from that given</p>	(2)

Question Number	Answer	Acceptable answers	Mark
3(b)(i)	<ul style="list-style-type: none"> • 100 x 20 (1) • 2000 m² (1) 	<p>Bald answer 2000 (m²) (2)</p>	(2)

Question Number	Answer	Acceptable answers	Mark
3(b)(ii)	<p>A description including any three of the following points</p> <ul style="list-style-type: none"> • use a quadrat/select smaller area of the field (1) • place quadrat randomly/select areas randomly (1) • count the number of plants in each quadrat/location (1) • reference to use of several locations (1) • calculate average number of plants from quadrats/samples (1) • multiply sample size up to the total area of the field (1) 	<p>Accept: multiplied by 2000 m² (from 3bi)</p>	(3)

Question Number	Answer	Mark															
4(a)(i)	<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	(2)
A	T	A	G	C													
⋮	⋮	⋮	⋮	⋮													
T	A	T	C	G													

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

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

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

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

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

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

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

Question Number		Indicative Content	Mark
QWC	*5(c)	<p>An explanation including some of the following points in a logical sequence</p> <ul style="list-style-type: none"> • increased muscle contraction • blood is pumped faster around the body/to muscles • more oxygen/glucose delivered to cells/muscles • for aerobic respiration • which releases energy • rate of gas exchange increases • more carbon dioxide in the blood • more oxygen inhaled/into body • more carbon dioxide exhaled/from body • reduce build up of lactic acid 	(6)
Level	0	No rewardable content	
1	1 - 2	<ul style="list-style-type: none"> • a limited description of the reasons why heart or breathing rate increase with exercise e.g. blood flows faster or more oxygen is 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 that links an increase in heart rate with increased blood flow and an increase in breathing rate with increased oxygen uptake • 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 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. • the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately • spelling, punctuation and grammar are used with few errors 	

Question Number	Answer	Acceptable answers	Mark
5(d)	B – lactic acid		(1)

Question Number	Answer	Acceptable answers	Mark
6(a)(i)	(Label) B		(1)

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

Question Number	Answer	Acceptable answers	Mark
6(b)	<p>An explanation including three of the following points</p> <ul style="list-style-type: none"> • amylase is an enzyme (1) • (amylase) breaks down/digests starch (1) • to maltose/sugar (1) • maltose/sugar is a small/soluble molecule (1) • (and can) diffuse through the wall of the visking tubing (1) 	<p>glucose for maltose/ sugar</p> <p>allow 'pass through' for diffusion</p>	(3)

Question Number		Indicative Content	Mark
QWC	*6(c)	<p>A description including some of the following points in a logical sequence</p> <p>mouth</p> <ul style="list-style-type: none"> teeth chew food/break food down into smaller pieces increasing its surface area (and) mixes food with saliva so it can be swallowed more easily enzyme action in mouth / references to named enzymes? tongue helps to roll food into a ball/bolus (so it can be swallowed more easily) <p>oesophagus</p> <ul style="list-style-type: none"> swallowing muscular contractions/peristalsis in oesophagus pushes/moves food towards the stomach <p>stomach</p> <ul style="list-style-type: none"> contraction of muscle tissue in the stomach mixes food with acid and digestive juices enzyme action in stomach / references to named enzymes? hydrochloric acid contributes to the breakdown of food 	(6)
Level	0	No rewardable content	
1	1 - 2	<ul style="list-style-type: none"> 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. 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 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. 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 that describes most of the processes in at least two areas and includes the action of enzymes in the mouth or stomach the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately spelling, punctuation and grammar are used with few errors 	

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Order Code UG034041 November 2012

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