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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
1(a)	• 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 • 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)	• 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)	• 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 • 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)**

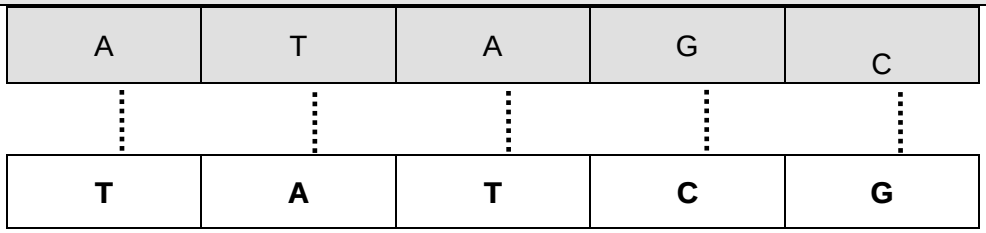
Question Number	Answer	Acceptable answers	Mark
3(a)(i)	A description including the following points • increases to midday/in the morning (1) • decreases from midday/ in the afternoon/to 6pm (1)	increases and then decreases (1) reference to highest rate around midday (1)	**(2)**

Question Number	Answer	Acceptable answers	Mark
3(a)(ii)	two of the following points • light (levels) (1) • temperature (1) • water (levels) (1) • carbon dioxide (concentration)(1)	mineral ion concentration cloudy too hot/cold Ignore: rain/weather Reject: (change of) seasons as 12 hour period in question	**(2)**

Question Number	Answer	Acceptable answers	Mark
3(a)(iii)	1 carbon dioxide/CO_2; 2 oxygen/O_2;	Ignore: sunlight/light energy Reject: CO^2 or O^2 or any other variation in formulae from that given	**(2)**

Question Number	Answer	Acceptable answers	Mark
3(b)(i)	• 100 x 20 (1) • 2000 m^2 (1)	Bald answer 2000 (m^2) (2)	**(2)**

Question Number	Answer	Acceptable answers	Mark
3(b)(ii)	A description including any three of the following points • 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)	Accept: multiplied by 2000 m^2 (from 3bi)	**(3)**

Question Number	Answer		Mark
4(a)(i)	 TAT (1) CG (1) Must be in correct order		**(2)**

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: • 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: • 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)	An explanation including any two of the following points • <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)	Accept: named valves Ignore: prevents from flowing backwards (as in the question)	**(2)**

Question Number	Answer	Acceptable answers	Mark
5(b)	A suggestion including any two of the following points • 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)	Accept: one side pumps blood to the body/lungs Accept: one side pumps oxygenated/deoxygenated blood	**(2)**

Question Number		Indicative Content	Mark
QWC	***5(c)**	An explanation including some of the following points in a logical sequence • 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**	• 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**	• 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**	• 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)	A description including any two from the following points • 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)	 named digestive enzymes named nutrients absorption/diffusion of food/nutrients	 **(2)**

Question Number	Answer	Acceptable answers	Mark
6(b)	An explanation including three of the following points • 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)	 glucose for maltose/ sugar allow ‘pass through’ for diffusion	 **(3)**

Question Number		Indicative Content	Mark
QWC	***6(c)**	A description including some of the following points in a logical sequence **mouth** • 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) **oesophagus** • swallowing • muscular contractions/peristalsis in oesophagus • pushes/moves food towards the stomach **stomach** • 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**	• 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**	• 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**	• 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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