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Mark Scheme (Results)

Summer 2016

Pearson Edexcel GCSE
in Biology (5BI2F) Paper 01
Unit 2: The Components of Life

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General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- For questions worth more than one mark, the answer column shows how partial credit can be allocated. This has been done by the inclusion of part marks eg (1).
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

Quality of Written Communication

Questions which involve the writing of continuous prose will expect candidates to:

- Write legibly, with accurate spelling, grammar and punctuation in order to make the meaning clear
- Select and use a form and style of writing appropriate to purpose and to complex subject matter
- Organise information clearly and coherently, using specialist vocabulary when appropriate.

Full marks will be awarded if the candidate has demonstrated the above abilities.

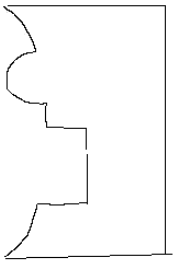
Questions where QWC is likely to be particularly important are indicated (QWC) in the mark scheme, but this does not preclude others.

Question Number	Answer	Acceptable answers	Mark
1(a)(i)	amylase		**(1)**
	(simple) sugars	Accept glucose	**(1)**

Question Number	Answer	Acceptable answers	Mark
1(a)(ii)	B small intestine		**(1)**

Question Number	Answer	Acceptable answers	Mark
1(b)(i)	A description linking two of the following • increases (1) • (peaks) between 36°C-38°C / at 50 (au) (1) • decreases (1)		**(2)**

Question Number	Answer	Acceptable answers	Mark
1(b)(ii)	An explanation linking two of the following • above optimum temperature/above value between 36-38 °C (1) • enzyme/active site changed shape (1) • enzyme is denatured (1) • so it will not fit with the substrate / form an enzyme substrate complex / no longer complementary to the substrate (1)	Accept destroyed / breaks down	**(2)**

Question Number	Answer	Acceptable answers	Mark
1(c)	Any drawing that shows that the enzyme has a complementary shape to any part of the substrate e.g. 		**(1)**

Total for question 1 = 8 marks

Question Number	Answer	Acceptable answers	Mark
2(a)(i)	**D**		**(1)**

Question Number	Answer	Acceptable answers	Mark
2(a)(ii)	evolution		**(1)**

Question Number	Answer	Acceptable answers	Mark
2(a)(iii)	An explanation including two of the following: • fossils do not always form (1) • soft tissue decays (1) • some fossils not found (1) • some fossils destroyed (1)		**(2)**

Question Number	Answer	Acceptable answers	Mark
2(b)	**D** A with T		**(1)**

Question Number	Answer	Acceptable answers	Mark
2(c)(i)	mitosis		**(1)**

Question Number	Answer	Acceptable answers	Mark
2(c)(ii)	a description including two of the following • useful substances produced (1) • will have known / desired characteristics/same characteristics as parent (1) • conservation of endangered species / increase population size(1)	Accept example of useful substance	**(2)**

Total for question 2 = 8 marks

Question Number	Answer	Acceptable answers	Mark
3(a)(i)	**A** left atrium		**(1)**

Question Number	Answer	Acceptable answers	Mark
3(a)(ii)	A description to include the following • open / close (1) • to keep blood flowing in one direction / to prevent backflow (1)		**(2)**

Question Number	Answer	Acceptable answers	Mark
3(b)(i)	• 60 **and** 15 (1) • (X) 4	Allow 2 marks for correct bald answer	**(2)**

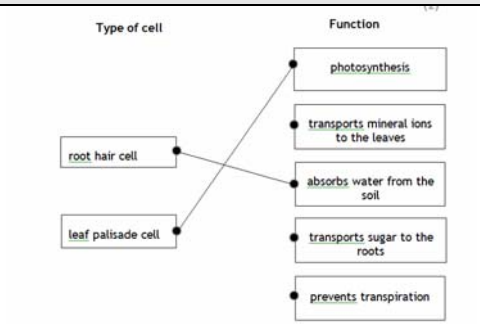
Question Number	Answer	Acceptable answers	Mark
3(b)(ii)	An explanation linking three from the following • more oxygen/glucose (needed) (1) • (more aerobic) respiration (1) • greater energy demand / muscles working harder/faster (1) • to remove (excess) carbon dioxide (1) • reduce lactic acid build-up/remove lactic acid (1)	Ignore reference to anaerobic respiration accept blood is diverted from other organs (1)	**(3)**

Question Number	Answer	Acceptable answers	Mark
3(c)	An explanation linking two of the following • not enough oxygen • (so) anaerobic respiration • supplies (more) energy	accept cannot respire aerobically any faster	**(2)**

Total for question 3 = 10 marks

Question Number	Answer	Acceptable answers	Mark
4(a)(i)	**B** cell wall		**(1)**

Question Number	Answer	Acceptable answers	Mark
4(a)(ii)	• contains DNA/chromosomes / genes / genetic information (1) • controls the cell (activities / reactions) / gives cell its characteristics (1)		**(2)**

Question Number	Answer	Acceptable answers	Mark
4(a)(iii)		Reject more than one line from each type of cell	**(2)**

Question Number	Answer	Acceptable answers	Mark
4(b)(i)	75 (mm) / ÷ 5 (1) 15 (mm)	Allow full marks for correct bald answer	**(2)**

Question Number	Answer	Acceptable answers	Mark
4(b)(ii)	A suggestion including **two** of the following: • any two named environmental factors (2) • (increased) photosynthesis (1) • different genes / different variety (of bean plant) (1) • grown for longer time / grew faster (1)	eg. light, water, carbon dioxide, minerals, temperature	**(2)**

Question Number	Answer	Acceptable answers	Mark
4(c)	**B** fertilisation		**(1)**

Total for question 4 = 10 marks

Question Number	Answer	Acceptable answers	Mark
5(a)(i)	**D** Watson and Crick		**(1)**

Question Number	Answer	Acceptable answers	Mark
5(a)(ii)	double helix		**(1)**

Question Number	Answer	Acceptable answers	Mark
5(b)	A description including two of the following • changed base / order of bases (1) • change in number of bases (1)	accept substitution eg A becomes T accept insertion or deletion eg ACTTGA becomes ATTGA	**(2)**

Question Number	Answer	Acceptable answers	Mark
5(c)	An explanation including two of the following: • higher magnification (1) • greater resolution / clearer image (1) • greater detail / can see more structures (1)	Allow reverse argument	**(2)**

Question Number		Indicative Content	Mark
QWC	***5(d)**	A description to include some of the following points Advantages • herbicide resistant • pest resistant • disease resistant • weather resistant • higher yield • better quality product • golden rice reducing problems of vitamin A deficiencies in humans Disadvantages • idea of monocultures • reduce biodiversity • idea of cross pollination may occur with weeds / other species • super weeds • ideas of farmers / countries becoming dependent on GM seed companies • only rich countries will be able to afford the seeds / poor countries will not be able to compete • cost of development	**(6)**
Level	**0**	No rewardable content	
1	**1 - 2**	• a limited description of either one advantage or one disadvantage • 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 of two or more advantages OR two or more disadvantages OR one advantage and one disadvantage • 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 of two or more advantages AND two or more disadvantages • 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
6(a)	A description including two of the following: • (attaches to) red blood cells (1) • transported through (named) blood vessels (1) • (blood) pumped / moved by heart (1)	accept dissolved in plasma Ignore other named blood components attaches to haemoglobin (1)	**(2)**

Question Number	Answer	Acceptable answers	Mark
6(b)(i)	A description including two of the following: • through xylem (vessels) (1) • transpiration (stream) (1) • into leaf cells by osmosis (1)	ignore phloem accept diffusion	**(2)**

Question Number	Answer	Acceptable answers	Mark
6(b)(ii)	An explanation including two of the following: • (at midday) more light / higher temperature (1) • more stomata open (1) • (more) evaporation / transpiration (1)	allow more sun ignore references to water drying up	**(2)**

Question Number		Indicative Content	Mark
QWC	***6(c)**	A description to include some of the following points Equipment • use a pooter • use of pitfall traps • use of sweep nets • use of quadrats Description of method • pooter to suck up insects without damaging them • pitfall trap buried to trap walking insects • sweep nets to collect flying insects / in long grass • quadrat used to sample plants/insects • count plants / quantify numbers of insects Process • sampling occurs randomly • sampling occurs several times • sampling occurs in different locations • calculate an average • multiply average by area of a field / scale up	**(6)**
Level	**0**	No rewardable content	
1	**1 - 2**	• a limited description that includes at least two pieces of indicative content from any section • 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 at least two pieces of equipment with their method of use OR a detailed description of one piece of equipment with its method of use AND its linked process • 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 links at least two pieces of equipment with their method of use AND at least one linked process • the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately • spelling, punctuation and grammar are used with few errors	

Total for question 6 = 12 marks

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