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Mark Scheme (Results)

January 2016

Pearson Edexcel International GCSE in Biology (4BI0) Paper 2B

Pearson Edexcel Certificate in Biology (KBI0) Paper 2B

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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.
- 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.

Question number	Answer	Notes	Marks
1 (a)	removal of nucleus / without a nucleus / no nucleus / eq;	ignore without DNA	1
(b)	retina / fovea / yellow spot / macula / macula lutea;	reject if in list eg. retina and iris	1
(c)	1. less (aerobic) respiration; 2. less energy / ATP; 3. <u>anaerobic</u> respiration; 4. lactic acid; 5. low pH / acidic; 6. denature <u>enzymes</u>;	5. ignore if linked to carbon dioxide	4
(d)	1. thin / one cell thick; 2. pores / gaps / permeable / eq; 3. short <u>diffusion</u> distance / faster <u>diffusion</u> / better <u>diffusion</u> / eq;	reject cell wall	2

(e)	1. not rejected / no need to match / for specific person; 2. no shortage of organs / less waiting time / better supply / no need of donors / organs always available; 3. free from infection / free from disease / ref. to age;		2
(f)	1. nucleus (from body cell) put into empty egg / enucleated egg; 2. electricity; 3. mitosis / cell division; 4. embryo; 5. uterus / womb; 6. surrogate mother;	ignore DNA removed	5

Total 15 marks

Question number	Answer	Notes	Marks
2 (a) (i)	1. measure mass / measure weight / measure water loss; 2. in one minute / in an hour / per minute / per hour / per day / after a period of time / eq;	 2. ignore before and after / at the end of the experiment	2
(ii)	1. no plant; 2. oil layer and water present; 3. balance present;	ignore twig with no leaves ignore number on balance labels not needed	3

(b)

change of condition	Change in transpiration rate	Explanation
warmer air	**increase;**	**more (kinetic) energy / more evaporation / molecules move faster / eq;**
put in the dark decrease	put in the dark decrease	**stomata close;**
increased wind increase	increased wind	**increased concentration gradient / moves molecules away / blows water away / eq;**
increased humidity	**decrease;**	decreased concentration gradient

5

(c)

1. supply mineral ions / supply named mineral ion; — 1. ignore nutrients
2. support / turgidity / prevent wilting / eq;
3. cooling / prevent overheating; — 3. ignore homeostasis idea
4. water for photosynthesis; — ignore growth

2

Total 12 marks

Question number	Answer	Notes	Marks
3 (a)	1. eat (more) plants / eats grass / eq; 2. food difficult to digest / less food digested / break down less food / food egested / eq; 3. cellulose;	allow converse for fish	2
(b)	1. more cells / bigger; 2. heat loss; 3. use more energy in movement;	3. ignore move more	1
(c)	1. keep indoors; 2. less heat loss / maintain body temperature / less energy loss / keep warm; OR 3. restrict movement / eq; 4. less <u>respiration</u> / less <u>energy</u> used; OR 5. more digestible food / food with more energy / food with more fat; 6. more energy absorbed;		4

Total 7 marks

Question number	Answer	Notes	Marks
4 (a) (i)	1. distribute food / nutrients / eq; 2. distribute oxygen; 3. even out temperature / distribute heat;	 2. ignore air 3. ignore maintain temperature constant	2
(ii)	1. optimum / best / suitable for enzymes; 2. prevent denaturation / prevent change to active site;	 2. ignore death of microbes	2
(iii)	insulin / antibiotics / enzymes / hormones / yeast / amino acids / clotting factors / gibberellin / eq;	reject ethanol / beer / biogas / yoghurt / medicine / drugs	1
(b)	1. stop air supply / stop oxygen supply; 2. open pressure release valve / have exit pipe (for biogas) / eq;	1. ignore reduce air supply / remove air filter	2

Total 7 marks

Question number	Answer	Notes	Marks
5 (a) (i)	1. (flask X) red / orange; 2. (flask Y) yellow;		2
(ii)	(more) carbon dioxide (in flask Y) / carbon dioxide produced;	ignore colour eg. goes purple because of CO_2 = 1	1
(b) (i)	1. colour change faster for small hamster / takes less time for small hamster / eq; 2. more respiration with small hamster / faster production of carbon dioxide / eq; 3. larger surface area to volume / loses <u>more</u> heat maintain body temperature / eq;	allow converse	2
(ii)	1. <u>optimum</u> temperature; 2. enzymes;	2. reject if enzymes die	2
(c) (i)	only one reading / not repeated / not enough results / only one hamster of each size used / eq;		1
(ii)	difficult to tell when colour changes / eq;	ignore gas escape / loose bung	1

(d)	1. age / species / type; 2. temperature; 3. volume of indicator; 4. concentration of indicator;	mark first three answers 3 and 4 ignore amount ignore activity / size of bell jar	3

Total 12 marks

Question number	Answer	Notes	Marks
6 (a)	root appears / shoot appears / sprout / seed coat splits / eq;	ignore growth alone	1
(b)	1. oxygen; 2. respiration; 3. water / moisture / rain; 4. (activate) enzymes / reactions / hydrolysis / digestion / eq; 5. warmth / suitable temperature / optimum temperature; 6. enzymes / reactions; 7. light; 8. activate plant growth regulators / eq;	ignore air / pH 3. ignore humid 5. ignore temperature alone / heat four conditions and no explanations = 3 max	6

Total 7 marks

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