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Edexcel

Mark Scheme (Results)

November 2020

Pearson Edexcel International GCSE  
In Science (Single Award) (4SS0) Paper 1B

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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	Mark
<b>1(a)</b>	D muscle  <i>A is incorrect because it is not blood B is incorrect because it is not bone C is incorrect because it is not elastic</i>	<b>1 comp</b>

Question Number	Answer	Additional guidance	Mark
<b>1(b)</b>	A description that makes reference to the following points: <ul style="list-style-type: none"> <li>• contraction (of muscle) (1)</li> <li>• diaphragm moves down / flattens (1)</li> <li>• ribs move up/out (1)</li> <li>• increase volume in thorax (1)</li> <li>• decrease pressure in thorax/lung (1)</li> </ul>	Mp4+mp5 require idea of <i>change</i> in volume /pressure	<b>4 exp</b>

Question Number	Answer	Mark
<b>1(c)</b>	A $2.5 \times 10^{-4}$  <i>B is incorrect because <math>2.5 \times 10^4</math> is 25 000 C is incorrect because <math>25 \times 10^{-4}</math> is 0.0025 D is incorrect because <math>25 \times 10^4</math> is 250 000</i>	<b>1 comp</b>

Question Number	Answer	Additional guidance	Mark
<b>1(d)</b>	An explanation that makes reference to the following points: <ul style="list-style-type: none"> <li>• higher surface area has greater respiration rate (1)</li> <li>• higher oxygen diffusion / more oxygen diffuses/ eq (1)</li> </ul>	Accept reverse argument for lower s.a.	<b>2 exp</b>

Total 8 marks

Question Number	Answer	Additional guidance	Mark
<b>2(a)</b>	(number of plants)	(2)	Mark each row independently.  <b>3 cler</b>
	number of primary consumers	2 or two	
	number of carnivores	2 or two	
	number of food chains	6 or six	

Question Number	Answer	Additional guidance	Mark
<b>2(b)</b>	<p>An answer that makes reference to two of the following points:</p> <ul style="list-style-type: none"> <li>• coloured / bright / large petals (1)</li> <li>• enclosed anthers / short filaments (1)</li> <li>• enclosed stigma / short style (1)</li> <li>• sticky stigma / sticky pollen / rough surface on pollen (1)</li> <li>• scent / eq / (1)</li> </ul>		<b>2 grad</b>

Question Number	Answer	Additional guidance	Mark
<b>2(c)(i)</b>	<ul style="list-style-type: none"> <li>• select correct slope 1.3-0.7 (1)</li> <li>• calculation 0.6 (1)</li> </ul>	<p>Award full marks for correct numerical answer without working</p> <p>Award one mark for correct slope values 1.3 <u>and</u> 0.7 if final answer incorrect</p>	<b>2 grad</b>

Question Number	Answer	Mark
<b>2(c)(ii)</b>	<p>An answer that makes reference to one of the following points:</p> <ul style="list-style-type: none"> <li>• taken / fed on / drunk by insects (1)</li> <li>• evaporation (1)</li> </ul>	<b>1 grad</b>

Question Number	Answer	Additional guidance	Mark
<b>2(d)</b>	<p>An answer that makes reference to two of the following points:</p> <ul style="list-style-type: none"> <li>• prevent ants eating/removing/destroying <u>pollen</u> (1)</li> <li>• prevent ants / (other) insects from eating <u>flower</u> / named floral part e.g. petal (1)</li> <li>• prevent ants eating other insects / pollinators (1)</li> <li>• more nectar left (for attracting pollinators/other insects) (1)</li> <li>• more chance of being pollinated / can still be pollinated / more pollinators come (1)</li> </ul>	<p>For mp1,2,3 ignore 'harm' 'damage' unqualified</p>	<b>2 exp</b>

Total 10 marks

Question Number	Answer	Additional guidance	Mark
<b>3(a)</b>	An answer that makes reference to the following points: <ul style="list-style-type: none"> <li>no chloroplast / no chlorophyll (1)</li> <li>wall made of chitin (1)</li> </ul>	allow plant cell has  chlorophyll/ chloroplast  cellulose cell wall  ignore references to shape	<b>2 grad</b>

Question Number	Answer	Mark
<b>3(b)(i)</b>	An explanation that makes reference to two of the following points: <ul style="list-style-type: none"> <li>aerobic respiration (1)</li> <li>more energy / ATP (1)</li> <li>anaerobic respiration produces alcohol (1)</li> <li>kills yeast cells / eq (1)</li> </ul>	<b>2 exp</b>

Question Number	Answer	Additional guidance	Mark
<b>3(b)(ii)</b>	An explanation that makes reference to two of the following points: <ul style="list-style-type: none"> <li>affects growth / kills yeast cells (1)</li> <li>compete for / use up glucose (1)</li> <li>remove pathogens (1)</li> </ul>	Ignore 'competition' unqualified	<b>2 grad</b>

Question Number	Answer	Additional guidance	Mark
<b>3(b)(iii)</b>	<p>An answer that makes reference to three of the following points:</p> <ul style="list-style-type: none"> <li>• species of yeast / type of yeast / yeast from same batch (1)</li> <li>• temperature (1)</li> <li>• pH (of solution) (1)</li> <li>• concentration of glucose (1)</li> <li>• depth of sample (1)</li> <li>• view at same magnification / same area of field of view (1)</li> </ul>	<p>Allow same source of yeast</p> <p>Ignore light intensity</p> <p>Ignore volume of sample</p> <p>Ignore volumes of gases/named gases</p>	<b>3 exp</b>

Question Number	Answer		Mark
<b>3(b)(iv)</b>	<p>An answer that makes reference to the following point:</p> <ul style="list-style-type: none"> <li>• reliable because results are similar / concordant / eq</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>• not reliable because insufficient repeats / only three repeats done / eq</li> </ul>		<b>1 grad</b>

Total 10 marks



Question Number	Answer	Additional guidance	Mark
<b>4</b>	<p>An answer that makes reference to six of the following points:</p> <p>C range of salt concentration / salty and not salty / salt and no salt (1)</p> <p>O same saliva / same amylase (1)</p> <p>R repeat investigation (1)</p> <p>M1 measure <u>time</u> for starch to disappear/<u>time</u> for glucose to appear/<u>concentration</u> of starch (1)</p> <p>M2 use of iodine solution / use of Benedict's / use colorimeter (1)</p> <p>S1 same <u>concentration</u> of amylase or saliva / same <u>volume</u> of amylase or saliva / same (starting) <u>concentration</u> of starch / same (starting) <u>volume</u> of starch / (1)</p> <p>S2 same pH / same temp (1)</p>	<p>M2 test must be appropriate for M1 method</p> <p>Ignore 'amount' throughout</p> <p>S2 Allow same time if measuring concentration of starch</p> <p>Ignore light, CO<sub>2</sub>, O<sub>2</sub></p>	<b>6 exp</b>

Total 6 marks

Question Number	Answer	Mark
<b>5(a)(i)</b>	A one  <i>B is incorrect because it is not three</i> <i>C is incorrect because it is not four</i> <i>D is incorrect because it is not eight</i>	<b>1 comp</b>

Question Number	Answer	Mark
<b>5(a)(ii)</b>	D nine  <i>A is incorrect because it is not one</i> <i>B is incorrect because it is not three</i> <i>C is incorrect because it is not eight</i>	<b>1 comp</b>

Question Number	Answer	Mark
<b>5(a)(iii)</b>	C 0.5  <i>A is incorrect because it is not 0.0</i> <i>B is incorrect because it is not 0.25</i> <i>D is incorrect because it is not 1.0</i>	<b>1 comp</b>

Question Number	Answer	Mark
<b>5(a)(iv)</b>	0.125 / 12.5% / 1/8	<b>1 cler</b>

Question Number	Answer	Additional guidance	Mark
<b>5(b)</b>	<ul style="list-style-type: none"> <li>• <math>64 \div 500\,000 \times 100</math></li> <li>• <math>= 0.013</math> or <math>1.3 \times 10^{-2}</math></li> </ul>	<p>Award full marks for correct numerical answer without working Allow 0.0128 Allow <math>1.28 \times 10^{-2}</math></p> <p>Award one mark for correct working if final answer incorrect</p> <p><math>64 \div 500\,000 \times 100</math></p> <p>or</p> <p>evidence of 128 or 13 in working</p>	<b>2 grad</b>

Question Number	Answer	Additional guidance	Mark
<b>5(c)</b>	<p>An explanation that makes reference to three of the following points:</p> <ul style="list-style-type: none"> <li>• reduced ability to exercise / can't run fast / tires easily (when exercising) / tires faster (when exercising) (1)</li> <li>• less oxygen coming from lungs (1)</li> <li>• less oxygen to body / muscles (1)</li> <li>• less respiration / less energy / more <u>anaerobic</u> respiration/ lactic acid present (1)</li> </ul>	Ignore 'less oxygen' unqualified	<b>3 exp</b>

Total 9 marks

Question Number	Answer	Additional guidance	Mark
<b>6</b>	<p>An answer that makes reference to four of the following points:</p> <ol style="list-style-type: none"> <li>1. drug reduces number of bacteria / fewer bacteria with drug (1)</li> <li>2. phagocytes (may be) more active with drug (1)</li> <li>3. phagocytosis / phagocytes ingest / engulf / digest bacteria (1)</li> <li>4. drug may kill bacteria directly /eq (1)</li> <li>5. not tested on virus / fungus (1)</li> <li>6. not tested on lymphocytes / not certain reduction due to (just) phagocytes / lymphocytes may have produced antibodies (1)</li> <li>7. (only) one species of bacteria used / need to test more types of bacteria / bacteria used may not be a pathogen (1)</li> <li>8. no information about control of variables / named variable (1)</li> <li>9. no information about size / gender / health / ages / immune status of sample /eq (1)</li> </ol>	<p>Accept reverse argument for mp1+2 without drug</p> <p>Mp3 is role of phagocytes</p> <p>Mp8 refers to procedural variables</p> <p>Mp9 refers to representative sample</p>	<b>4 exp</b>

Total 4 marks

Question Number	Answer	Additional guidance	Mark
<b>7(a)(i)</b>	An answer that makes reference to one of the following points: <ul style="list-style-type: none"> <li>cellulose (1)</li> <li>glucose (1)</li> <li>starch (1)</li> </ul>	Allow named carbohydrate	<b>1 grad</b>

Question Number	Answer	Additional guidance	Mark
<b>7(a)(ii)</b>	An answer that makes reference to two of the following points: <ul style="list-style-type: none"> <li>add ethanol (1)</li> <li>add to water and look for white emulsion (1)</li> </ul>	Allow  Sudan III (1)  turns red (1)	<b>2 grad</b>

Question Number	Answer	Mark
<b>7(a)(iii)</b>	<b>all of C H O N S and no others</b> or <b>all of carbon hydrogen oxygen nitrogen sulfur /sulphur and no others</b>	<b>1 grad</b>

Question Number	Answer	Additional guidance	Mark
<b>7(b)</b>	An explanation that makes reference to three of the following: <ul style="list-style-type: none"> <li>cell wall not broken down / cell wall not digested / cell wall still there (1)</li> <li>(cell wall made of) <u>cellulose</u> / requires <u>cellulase</u> (1)</li> <li>(cell) contents / organelles / named organelle(s) digested / broken down (1)</li> <li>by enzymes (1)</li> </ul>	Ignore cell membrane in mp1  Mp3 naming organelles alone is insufficient  Mp4 refers to enzyme action on cell contents / organelles	<b>3 exp</b>

Question Number	Answer		Mark
<b>7(c)</b>	<p>An explanation that makes reference to six of the following points:</p> <p><u>In support:</u></p> <ol style="list-style-type: none"> <li>1. can control growth rate (of grass) / give optimum conditions / controlled conditions / eq (1)</li> <li>2. less chance of grass being eaten by insects / pests (1)</li> <li>3. less wastage of minerals / reference to draining back minerals (1)</li> <li>4. uses less land / space (than equivalent number of fields) (1)</li> <li>5. fields can be used to grow other crops (1)</li> <li>6. grass available in dry or cold part of the world / grass (harvest/growth) less weather dependent (1)</li> <li>7. (fresh) grass available all year / continuous supply of (fresh) grass / higher yield (1)</li> <li>8. animals move less / less (animal) heat loss, so more energy for (animal) growth (1)</li> </ol> <p><u>Not in support:</u></p> <ol style="list-style-type: none"> <li>9. lighting / heating / electricity costs money (1)</li> <li>10. expensive to build / high initial cost for building/machinery (1)</li> <li>11. needs labour to fill trays / fill building (1)</li> <li>12. lacks aesthetic appeal / eq (1)</li> <li>13. manure not spread on fields (1)</li> <li>14. animals are not able to graze at will / not free range (1)</li> </ol>	<p>Mp7 Ignore 'enough grass' 'lots of grass' unqualified</p> <p>Economic arguments in mp9, mp10, mp11 must be qualified - 'needs a lot of money'/eq alone is insufficient</p>	<b>6 exp</b>

Total 13 marks

