



Mark Scheme (Results)

November 2020

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

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

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

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

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

Total 8 marks

Question Number	Answer	Additional guidance	Mark
2(a)	(number of plants)	(2)	Mark each row independently. 3 cler
	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
2(b)	<p>An answer that makes reference to two of the following points:</p> <ul style="list-style-type: none"> • coloured / bright / large petals (1) • enclosed anthers / short filaments (1) • enclosed stigma / short style (1) • sticky stigma / sticky pollen / rough surface on pollen (1) • scent / eq / (1) 		2 grad

Question Number	Answer	Additional guidance	Mark
2(c)(i)	<ul style="list-style-type: none"> • select correct slope 1.3-0.7 (1) • calculation 0.6 (1) 	<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>	2 grad

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

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

Total 10 marks

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

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

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

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

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

Total 10 marks

Question Number	Answer	Additional guidance	Mark
4	<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/measure <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, CO₂, O₂</p>	6 exp

Total 6 marks

Question Number	Answer	Mark
5(a)(i)	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>	1 comp

Question Number	Answer	Mark
5(a)(ii)	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>	1 comp

Question Number	Answer	Mark
5(a)(iii)	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>	1 comp

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

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

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

Total 9 marks

Question Number	Answer	Additional guidance	Mark
6	<p>An answer that makes reference to four of the following points:</p> <ol style="list-style-type: none"> 1. drug reduces number of bacteria / fewer bacteria with drug (1) 2. phagocytes (may be) more active with drug (1) 3. phagocytosis / phagocytes ingest / engulf / digest bacteria (1) 4. drug may kill bacteria directly /eq (1) 5. not tested on virus / fungus (1) 6. not tested on lymphocytes / not certain reduction due to (just) phagocytes / lymphocytes may have produced antibodies (1) 7. (only) one species of bacteria used / need to test more types of bacteria / bacteria used may not be a pathogen (1) 8. no information about control of variables / named variable (1) 9. no information about size / gender / health / ages / immune status of sample /eq (1) 	<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>	4 exp

Total 4 marks

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

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

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

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

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

Total 13 marks