Pearson Edexcel

Mark Scheme (Results)

Summer 2019

Pearson Edexcel GCSE

In Science Single Award (4SS0) Paper 1B

Question Number	Answer	Mark
1(a)(i)	The only correct answer is C 11 A is not correct as it does not contain 1 B is not correct as it does not contain 6 D is not correct as it does not contain 12	**1**

Question Number	Answer	Mark
1(a)(ii)	• mitochondrion / mitochondria	**1**

Question Number	Answer	Mark
1(b)	The only correct answer is D ×600 A is not correct as it is not ×0.06 B is not correct as it is not ×0.6 C is not correct as it is not ×6	**1**

Question Number	Answer	Mark
1(c)(i)	• chloroplast / (sap) vacuole	**1**

Question Number	Answer	Mark
1(c)(ii)	An answer that makes reference to one of the following points: • nucleoid / circular chromosome / cytoplasm (1) • plasmid(s) (1)	**1**

Total 5

<table>
<tr><th>Question Number</th><th>Answer</th><th>Mark</th></tr>
<tr><td>2(a)</td><td>
<table>
<tr><th>Enzyme</th><th>Function</th><th>Name of process</th></tr>
<tr><td>protease / pepsin /eq (1)</td><td>breaks down protein into amino acids</td><td>digestion (1)</td></tr>
<tr><td>maltase</td><td>maltose to glucose (1)</td><td>digestion</td></tr>
<tr><td>restriction /endonuclease (1)
Ignore helicase</td><td>cut DNA</td><td>genetic modification</td></tr>
</table>
</td><td>4</td></tr>
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Question Number	Answer	Mark
2(b)(i)	The only correct answer is C 6.2 A is not correct as it is not 1.0 B is not correct as it is not 2.5 D is not correct as it is not 10.0	**1**

Question Number	Answer	Additional guidance	Mark
2(b)(ii)	An explanation that makes reference to two of the following points: • lower / slower at pH 1.0 / lower pH (1) • enzyme is denatured / active site is altered / change in shape of active site (1) • substrate no longer fits / binds / forms enzyme - substrate complexes /eq(1)	allow pH 2.5 is optimum allow converse for 2.5	**2**

Total 7

Question Number	Answer	Additional guidance	**Mark**
3(a)	A description that makes reference to the following points: • no nucleus (1) • (bi)concave shape / indented / dip in middle / eq (1) • small(er) (1)	Allow converse for mp 1 and 3 wbc Allow for mp 2 wbc is irregular shape /can change shape	**3**

Question Number	Answer	**Mark**
3(b)(i)	An explanation that makes reference to two of the following points: • cells burst / explode (1) • water enters / absorbed /eq (1) • osmosis (1)	**2**

Question Number	Answer	**Mark**
3(b)(ii)	• cell showing crumpled appearance	**1**

Question Number	Answer	Additional guidance	**Mark**
3(c)	• 1000 mm^3 in each cm^3 so × 1000 = 5 x 10^9 / 5 000 000 000 • 1000 cm^3 in one dm^3 so × 1000 = 5 x 10^{12} / 5 000 000 000 000 • ×4 = **20 x 10^{12}** or **2 x 10^{13}** or **20 000 000 000 000**	award full marks for correct answer without working allow 1 mark for 20 or 2 etc	**2**

Total 8

Question Number	Answer	Additional guidance	**Mark**
4(a)	An explanation that makes reference to the following points: • (boiled to) remove oxygen / kill any other organisms / bacteria /eq(1) • (cooled so) enzymes not denatured / destroyed / yeast not killed (1)	 Ignore germs Ignore (to ensure it is) anaerobic Reject enzymes killed	**2**

Question Number	Answer	Additional guidance	**Mark**
4(b)	An explanation that makes reference to the following points: • measuring cylinder / syringe / eq (1) • (therefore) measure <u>volume</u> / <u>cm^3</u> (1)	 Ignore amount	**2**

Question Number	Answer	**Mark**
4(c)(i)	He only correct answer is A removal of oil to allow oxygen diffusion B is not correct as remove liquid oil to allow carbon dioxide diffusion would not affect aerobic respiration C is not correct as add more liquid oil to prevent oxygen diffusion would reduce aerobic respiration D is not correct as add more liquid oil to prevent carbon dioxide diffusion would not affect aerobic respiration	**1**

Question Number	Answer	**Mark**
4(c)(ii)	An answer that makes reference to the following points: • *y-axis* labelled number / amount / number of bubbles / bubbles produced / rate of respiration **and** *x-axis* labelling anaerobic and aerobic (bars) (1) • two bars drawn **and** bar for aerobic respiration is higher (1)	**2**

Total 7

Question Number	Answer	Additional guidance	**Mark**
5(a)(i)	An answer that makes reference two the following points: • (male parent) Bb / heterozygous (1) • (female parent) Bb / heterozygous (1) • (because one of the) offspring is bb / homozygous recessive (1)	Both parents Bb =2	**2**

Question Number	Answer	**Mark**
5(a)(ii)	• 4 / four	**1**

Question Number	Answer	Additional guidance	**Mark**
5(b)	• 0.125 / 1/8 / 12.5% / 1 out of 8 (1)	Reject 1:8	**1**

Question Number	Answer	Additional guidance	**Mark**
5(c)	An explanation that makes reference to the following points: • (natural) selection (1) • white giraffes easily seen / not camouflaged / hunted eq (1) • die / killed / don't survive (1) • fewer reproduce / don't reproduce / no offspring (1) • allele for white not passed on (1)	Allow converse for brown for mp 2-5	**4**

Total 8

Question Number	Answer	Additional guidance	**Mark**
6(a)	An answer that makes reference to six of the following points: • C chickens kept indoors and outdoors (1) • O same age / size / mass / same breed / species/ sex (1) • R repeat / uses a large number (1) • M1 measure mass / length / weight (1) • M2 measure after stated time period (1) • S1 control food / diet /eq (1) • S2 control water / lighting / bedding / size of pen (1)	Not just use chickens Ignore size Ignore control temperature	**6**

Question Number	Answer	**Mark**
6(b)	The only correct answer is B biuret reagent A is not correct as Benedict's reagent is not used C is not correct as ethanol is not used D is not correct as iodine is not used	**1**

Question Number	Answer	Additional guidance	**Mark**
6(c)	An explanation that makes reference to the following points: • large(r) surface area to volume ratio (1) • (more) heat energy / loss (1) • respiration produces heat / replaces heat / eq(1) • maintain body temperature / keep warm / prevent cooling /eq (1)	Allow smaller vol to sa ratio Allow converse for large chicken	**4**

Total 11

Question Number	Answer	Mark
7(a)(i)	B	**1**

Question Number	Answer	Additional guidance	Mark
7(a)(ii)	An answer that makes reference to the following: • development of secondary sexual characteristics / named secondary sexual characteristic (1)	**Allow** repair / thickens of uterus lining / stimulate release of LH / inhibits FSH	**1**

Question Number	Answer	Mark
7(b)(i)	• zygote	**1**

Question Number	Answer	Additional guidance	Mark
7(b)(ii)	• 14 cm = 140 mm • 140 ÷ 3.0 = 47 (46.67) **2 marks for 46.67 – 47** **Allow 46.6 recurring =2**	award full marks for correct numerical answer without working 46 / 46.6 scores 1 allow 1 mark for 467 to 470 or 4.67 to 4.7 /eq in answer right digits wrong power	**2**

Total 5

Question Number	Answer	additional guidance	**Mark**
8(a)	An answer that makes reference to three of the following points: • thin / one cell thick / eq (1) • large surface area (1) • blood (supply) / capillaries (1)	Ignore permeable	**3**

Question Number	Answer	**Mark**
8(b)	An answer that makes reference to five of the following points: Argument for – (fish will live because) • window / light for photosynthesis (1) • photosynthesis / bubbles / aerator add oxygen to the water (1) • for respiration (1) (once in for OR against) • changing water removes waste / removes algae / less decomposition by bacteria / less chance of infection / disease (1) • food for energy / growth (1) Argument against – (fish may die because) • window / light causes algal growth / eq (1) • oxygen concentration falls (at night / after four days) (1) • large bubbles less diffusion (of oxygen / carbon dioxide) (1) • less carbon dioxide removal (1) • excess / waste food decomposed by bacteria (1) **Plus opinion** • not the best way to keep fish in an aquarium (1)	**6**

Total 9 marks