



Mark Scheme

Sample Assessment Material 2018

Pearson Edexcel International GCSE
In Biology (4BI1) Paper 1B

Pearson Edexcel International GCSE
in Science Double Award (4SD0) Paper 1B

Question Number	Answer	Mark
1(a)(i)	C contraction of ventricles	1

Question Number	Answer	Mark
1(a)(ii)	C right atrium	1

Question Number	Answer	Additional guidance	Mark
1(b)(i)	Counting <ul style="list-style-type: none"> • 6 peaks in 5.5s (1) Multiplication <ul style="list-style-type: none"> • $6 \div 5.5 \times 60 = 65$ (1) 	Award full marks for correct numerical answer without working	2

Question Number	Answer	Mark
1(b)(ii)	An explanation that makes reference to the following points: <ul style="list-style-type: none"> • more peaks / increased heart rate (1) • adrenaline (1) 	2

Total for Question 1 = 6 marks

Question Number	Answer	Mark
2(a)	An answer that makes reference to two the following points: <ul style="list-style-type: none"> • thin (1) • large surface area (1) • rich blood supply (1) 	2

Question Number	Answer	Mark
2(b)(i)	An answer that makes reference to five of the following points: <ul style="list-style-type: none"> • reduce population (1) • increase in oxygen consumption / demand (1) • reduction in available oxygen (1) • respiration affected (1) • bacteria grow (1) • death of fish (1) • migration (1) • only one fish used so results not reliable (1) 	5

Question Number	Answer	Mark
2(b)(ii)	<ul style="list-style-type: none"> • (water) temperature 	1

Question Number	Answer	Mark
2(b)(iii)	An explanation that makes reference to two of following points: <ul style="list-style-type: none">• fish killed (1)• enzymes denatured / eq (1)• less oxygen dissolved in water (1)• unethical / cruel / unnecessary (1)• range used is sufficient to show trend (1)	2

Total for Question 2 = 10 marks

Question Number	Answer	Mark
3 (a)	<ul style="list-style-type: none"> • spinal cord 	1

Question Number	Answer	Mark
3(b)(i)	B 1.40 mm per s	1

Question Number	Answer	Mark
3(b)(ii)	<p>An explanation that makes reference to four of the following points:</p> <ul style="list-style-type: none"> • person P (may) not be brain damaged because pupil diameter decreased (1) • person Q has brain damage because pupil diameter did not decrease (1) • person Q brain damage may be limited to part that controls eye / vision (1) • damage could be to retina (1) • damage could be to optic nerve / sensory nerve (1) • damage could be to motor nerve (1) • radial muscles relax contract / circular muscles contract in person P (1) 	4

Total for Question 3 = 6 marks

Question Number	Answer	Mark
4(a)	<p>An answer that makes reference to the following points:</p> <p>S scale linear and half grid (1)</p> <p>L lines clear and straight (1)</p> <p>A x axis is independent variable (1)</p> <p>A axes labelled with units (1)</p> <p>P points correctly plotted (1)</p> <p>K key provided (1)</p>	6

Question Number	Answer	Mark
4(b)	<p>An answer that makes reference to six of the following points:</p> <p>Argument for biological control being better:</p> <ul style="list-style-type: none"> • ref to data / numbers are lower with biological control (1) • biological control is specific / only kills whitefly (1) • no need to reapply (1) • pesticide fails to kill mutant / resistant whitefly (1) <p>Argument against biological control being better:</p> <ul style="list-style-type: none"> • ref to data / biological control takes longer to reduce whitefly (1) • wasps may escape and kill other species (1) • only one glasshouse used / data not reliable / no idea about the size of each glasshouse (1) • no idea about control of abiotic factors (1) • no idea about species / age / size of plant (1) 	6

Total for Question 4 = 12 marks

Question Number	Answer	Mark
5(a)(i)	A one of them	1

Question Number	Answer	Additional guidance	Mark
5(a)(ii)	Multiplication 5.4 million x 1000 (1) Expression = 5400 million / 5.4×10^9 / 5 400 000 000 (1)	Award full marks for correct numerical answer without working	2

Question Number	Answer	Additional guidance	Mark
5(b)(i)	Subtraction $25 - 15 = 10$ (1) Division and multiplication $10 \div 25 \times 100 = 40$ (1)	Award full marks for correct numerical answer without working	2

Question Number	Answer	Mark
5(b)(ii)	An explanation that makes reference to four of the following points: <ul style="list-style-type: none"> • less oxygen absorbed in lungs (1) • less oxygen transport to muscles (1) • less aerobic respiration (1) • less energy / ATP (1) • more lactic acid / anaerobic respiration (1) 	4

Total for Question 5 = 9 marks

Question Number	Answer	Mark
6(a)	<p>An explanation that makes reference to four of the following points:</p> <ul style="list-style-type: none"> • mutation causes variation (1) • those with flap of skin survive (1) • less energy used in finding food (1) • can cover greater distances to find more food (1) • easier to avoid predators (1) • reproduce and pass on allele for flap of skin (1) 	4

Question Number	Answer	Mark
6(b)	<p>A description that makes reference to four of the following points:</p> <ul style="list-style-type: none"> • oxygen (1) • glucose (1) • respiration / energy / ATP (1) • amino acids for protein (1) • diffusion (1) • remove carbon dioxide / urea (1) 	5

Question Number	Answer	Mark
6(c)	An explanation that makes reference to three of the following points: <ul style="list-style-type: none">• meiosis (1)• sperm/eggs have half the number of chromosomes (1)• sperm may contain X or Y chromosomes (1)• independent assortment / different combination of chromosomes from each parent (1)• random fertilisation (1)• mutation (1)	3

Total for Question 6 = 12 marks

Question Number	Answer	Additional guidance	Mark
7 (a)	<p>An answer that makes reference to the following points:</p> <ul style="list-style-type: none"> • measure oxygen produced / CO₂ used / starch produced (1) • by counting bubbles / use measuring cylinder / hydrogen carbonate / iodine (1) • stated time period (1) • control of abiotic variable (1) 	<p>ALLOW glucose</p> <p>ALLOW Benedict's</p>	4

Question Number	Answer	Additional guidance	Mark
7 (b)(i)	<p>A description that makes reference to the following points:</p> <ul style="list-style-type: none"> • both show peaks at blue and red (1) • both show trough in green / yellow (1) 		2

Question Number	Answer	Mark
7(b)(ii)	<p>An explanation that makes reference to the following points:</p> <ul style="list-style-type: none"> • chlorophylls absorb different wavelength / colour of light (1) • green light / 500 to 600 not absorbed / reflected so no effect on photosynthesis (1) • blue / red light is absorbed so is effective at increasing photosynthesis (1) 	3

Question Number	Answer	Mark
7(c)(i)	C light energy is converted to chemical energy	1

Question Number	Answer	Mark
7(c)(ii)	B increase in the availability of carbon dioxide	1

Total for Question 7 = 11 marks

Question Number	Answer	Mark
8(a)	<ul style="list-style-type: none"> • A stigma • B anther 	2

Question Number	Answer	Additional guidance	Mark
8 (b)	<p>An answer that makes reference to four of the following points:</p> <ul style="list-style-type: none"> • Flower 1 is insect pollinated / Flower 2 is wind pollinated (1) • as Flower 1 has large petals / Flower 2 has no / small petals (1) • as Flower 1 is larger / Flower 2 is smaller (1) • as Flower 2 has exposed / feathery stigma / Flower 1 has enclosed stigma (1) • as Flower 2 has exposed anthers / hinged filaments / Flower 1 has enclosed anthers (1) 		4

Question Number	Answer	Additional guidance	Mark
8 (c)	<p>An answer that that makes reference to six of the following points:</p> <ul style="list-style-type: none"> • C use range of soil pH (1) • O use genetically identical flowers of same species (1) • R use many flowers in each soil pH (1) • M1 record colour of flower using chart/ extract pigment (1) • M2 grow plants for stated time (1) • S1 use same compost / same minerals / same water (1) • S2 same light intensity / same temperature / same CO₂ available (1) 	<p>To gain full credit full sentences and detail must be included</p>	6

Total for Question 8 = 12 marks

Question Number	Answer	Mark
9(a)	<ul style="list-style-type: none"> • AIDS / Ebola / measles / tobacco mosaic / eq; 	1

Question Number	Answer	Additional guidance	Mark
9 (b)	<p>An answer that makes reference to three of the following points:</p> <ul style="list-style-type: none"> • viruses cannot divide / reproduce without host cell (1) • viruses cannot respire (1) • viruses cannot make proteins (1) • viruses do not feed (1) • viruses do not grow (1) • viruses do not excrete (1) 		3

Question Number	Answer	Additional guidance	Mark
9 (c)	<p>An explanation that makes reference to four of the following points:</p> <ul style="list-style-type: none"> • viruses have antigens on their surface (1) • white blood cells involved (1) • phagocytes engulf viruses (1) • lymphocytes produce antibodies (1) • antibodies are virus specific (1) 		4

Question Number	Answer	Additional guidance	Mark
9 (d)	<p>An explanation that makes reference to four of the following points:</p> <ul style="list-style-type: none"> • most bacteria killed by antibiotic (1) • population number falls (1) • only resistant forms survive (1) • no competition with non-resistant strains (1) • reproduce and pass on allele for resistance (1) • most bacteria are now resistant (1) 		4

Question Number	Answer	Additional guidance	Mark
9(e)	<ul style="list-style-type: none"> • $2^6 = 64$ • $500 \times 64 = 32\ 000$ 	Award full marks for correct numerical answer without working	2

Total for Question 9 = 14 marks

Question Number	Answer	Mark														
10 (a)	<table border="1"> <thead> <tr> <th>Letter</th> <th>Name of process</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>fossilisation</td> </tr> <tr> <td>B</td> <td>combustion (1)</td> </tr> <tr> <td>C</td> <td>respiration (1)</td> </tr> <tr> <td>D</td> <td>photosynthesis (1)</td> </tr> <tr> <td>E</td> <td>feeding (1)</td> </tr> <tr> <td>F</td> <td>death (1)</td> </tr> </tbody> </table>	Letter	Name of process	A	fossilisation	B	combustion (1)	C	respiration (1)	D	photosynthesis (1)	E	feeding (1)	F	death (1)	5
Letter	Name of process															
A	fossilisation															
B	combustion (1)															
C	respiration (1)															
D	photosynthesis (1)															
E	feeding (1)															
F	death (1)															

Question Number	Answer	Additional guidance	Mark
10(b)(i)	<ul style="list-style-type: none"> measured size = 4.3 cm divided by 10 = 0.43 cm 	<p>ALLOW range from 4.2 - 4.4 cm</p> <p>Award full marks for correct numerical answer without working</p> <p>Size of woodlouse will depend upon how paper printing is set up, centres will need to measure this on the hard copy they use.</p>	2

Question Number	Answer	Mark
10(b)(ii)	A animals	1

Question Number	Answer	Mark
10(c)(i)	B fungi	1

Question Number	Answer	Additional guidance	Mark
10 (c) (ii)	<p>An answer that makes reference to two of the following points:</p> <ul style="list-style-type: none"> cellulose digested to glucose (1) glucose absorbed (1) gain (more) energy / respiration (1) 		2

Question Number	Answer	Additional guidance	Mark
10 (c) (iii)	An answer that makes reference to one of the following points: <ul style="list-style-type: none"><li>• bacteria get shelter (1)<li>• bacteria get warmth / eq (1)<li>• bacteria get food (1)		1

Total for Question 10 = 12 marks

Question Number	Answer	Additional guidance	Mark
11 (a)	A description that includes the following points: <ul style="list-style-type: none"> • site of respiration (1) • release energy / form ATP (1) 		2

Question Number	Answer	Additional guidance	Mark
11(b)(i)	<ul style="list-style-type: none"> • 1.4 divided by 100 x 20 (1) • x 1000 = 280 g (1) 	Award full marks for correct numerical answer without working	2

Question Number	Answer	Additional guidance	Mark
11 (b)(ii)	An explanation that includes the following points: <ul style="list-style-type: none"> • sperm need energy / ATP to swim to egg (1) • muscle cells need energy / ATP for contraction (1) 		2

Total for Question 11 = 6 marks