



Pearson
Edexcel

Mark Scheme (Results)

November 2024

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

Question Number	Answer	Mark
1(a)(i)	<p>D (T and U)</p> <p>A is not the answer as P and Q are not both the male parts</p> <p>B is not the answer as P and R are not both the male parts</p> <p>C is not the answer as S and T are not both the male parts</p>	1

Question Number	Answer	Mark
1(a)(ii)	<p>A (P)</p> <p>B is not the answer as pollen grains do not germinate on R</p> <p>C is not the answer as pollen grains do not germinate on S</p> <p>D is not the answer as pollen grains do not germinate on T</p>	1

Question Number	Answer	Mark
1(a)(iii)	<p>C (R)</p> <p>A is not the answer as P does not become the seed</p> <p>B is not the answer as Q does not become the seed</p> <p>D is not the answer as T does not become the seed</p>	1

Question Number	Answer	additional guidance	Mark
1(b)(i)	<p>A description that makes reference to two of the following:</p> <ul style="list-style-type: none"> • uses runners / stolons / eq (1) • stem / shoot (grows along ground) / eq (1) • breaks off / grows roots / produces new plant / clone / eq (1) 	ignore cuttings	2

	Answer	additional guidance	Mark
1(b)(ii)	<p>An answer that description that makes reference to four of the following:</p> <ol style="list-style-type: none"> 1. (use sexual reproduction) cross with different variety / different plant / selective breeding / eq (1) 2. transfer pollen / cross pollinate / eq (1) 3. to produce different flavour / new flavour / desired flavour / variation / eq (1) 4. (use asexual) / runners / cuttings / micropropagation / eq (1) 5. produces genetically identical plants / clones / eq (1) 6. many offspring produced / large numbers / eq (1) 	<p>method</p> <p>linked to sexual</p> <p>method</p> <p>linked to asexual</p> <p>linked to asexual</p> <p>rapidly alone not enough</p>	4

Total 9 marks

	Answer	additional guidance	Mark
2	<ol style="list-style-type: none">1. trachea / windpipe (1)2. bronchi / bronchus (1)3. bronchiole(s) (1)4. alveoli / alveolus (1)5. diaphragm (1)6. intercostal (1)	ignore internal / external	6

total 6 marks

Question Number	Answer	Mark
3(a)(i)	A (P) B is not the answer as Q is not the oesophagus C is not the answer as R is not the oesophagus D is not the answer as U is not the oesophagus	1

Question Number	Answer	Mark
3(a)(ii)	D (T) A is not the answer as P is not part of the large intestine B is not the answer as Q is not part of the large intestine C is not the answer as R is not part of the large intestine	1

Question Number	Answer	Mark
3(a)(iii)	C (S) A is not the answer as Q does not contain villi B is not the answer as R does not contain villi D is not the answer as V does not contain villi	1

Question Number	Answer	Mark
3(a)(iv)	A (Q) B is not the answer as S is not the stomach C is not the answer as T is not the stomach D is not the answer as V is not the stomach	1

Question Number	Answer	additional guidance	Mark
3(b)	<p>A description that makes reference to the following:</p> <ul style="list-style-type: none"> • <u>peristalsis</u> (1) • <u>muscles</u> contract (behind food) / <u>muscles</u> push (food along) / <u>muscles</u> squeeze / eq (1) 	ignore muscles move	2

	Answer	additional guidance	Mark
3(c)(i)	<p>An answer that makes reference to four of the following:</p> <ol style="list-style-type: none"> 1. more protein in young dog food as they are growing more / for growth / eq (1) 2. amino acids for protein synthesis / eq (1) 3. more fat in young dog food as more active / for growth / eq (1) 4. more fat for energy / for respiration / eq (1) 5. more calcium in young dog food as more bone and teeth growth / eq (1) 6. more phosphate for bones / ATP / DNA /eq (1) 7. all components higher in young dog food / total percentage higher / eq (1) 	<p>allow converse for adult</p> <p>stated not cumulative</p> <p>if mp 1-6 not credited allow one mark max for one correct difference</p> <p>eg more protein in</p>	4

		young dog food	
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	Answer	additional guidance	Mark
3(c)(ii)	<p>An answer that makes reference to three of the following:</p> <ol style="list-style-type: none"> 1. excess carbohydrates / starch / glucose / energy converted to fat / eq (1) 2. may gain (too much) mass / become obese / overweight / eq (1) 3. may become diabetic / have heart disease / CHD / eq (1) 4. may fail to thrive / grow / eq (1) 5. as lack protein / eq (1) 	ignore become fat	3

total 13 marks

Question Number	Answer	Mark
4(a)(i)	<p>B (F and H)</p> <p>A is not the answer as E and J do not refract light</p> <p>C is not the answer as G and K do not refract light</p> <p>D is not the answer as I and J do not refract light</p>	1

Question Number	Answer	Mark
4(a)(ii)	<p>C (G)</p> <p>A is not the answer as E does not control the amount of light</p> <p>B is not the answer as F does not control the amount of light</p> <p>D is not the answer as H does not control the amount of light</p>	1

Question Number	Answer	Mark
4(a)(iii)	<p>D (K)</p> <p>A is not the answer as H does not contain light sensitive cells</p> <p>B is not the answer as I does not contain light sensitive cells</p> <p>C is not the answer as J does not contain light sensitive cells</p>	1

Question Number	Answer	Additional guidance	Mark
4(b)	<p>A description that makes reference to four of the following points:</p> <ol style="list-style-type: none"> 1. the <u>ciliary</u> muscle(s) <u>contract</u> / structure I <u>contract(s)</u> / eq (1) 2. the tension in the <u>suspensory ligament(s)</u> is reduced / loosened / slackens / eq (1) 3. the lens becomes thick(er) / wide(r) / fat(ter) / round(er) / more convex / eq (1) 4. the light is refracted more / bent more / eq (1) 5. <u>accommodation</u> (1) 	ignore relax	4

Question Number	Answer	Additional guidance	Mark
4(c)(i)	<p>An explanation that makes reference to two of the following points:</p> <ul style="list-style-type: none"> • lens becomes cloudy / opaque / misty / milky / eq (1) • less light enters eye / eq (1) • image dimmer / not formed / vision blurred / distorted / not clear / blindness / eq (1) 	ignore poor vision	2

Question Number	Answer	Additional guidance	Mark
4(c)(ii)	<ul style="list-style-type: none"> • glasses / contact lens / new lens inside eye / eye drops / eq (1) 	ignore laser eye surgery	1

total 10 marks

Question Number	Answer	additional guidance	Mark
5(a)(i)	<p>calculation method not marking points</p> <p>change in rate $50-20 = 30$</p> <p>$\% = 30 \div 20 \times 100$</p> <p>$= 150\%$ (2)</p>	<p>full marks for correct answer no working</p> <p>allow 1 mark for 30 or $50 \div 20$ or $(50-20) \div 20$</p>	2

Question Number	Answer	Additional guidance	Mark
5(a)(ii)	<p>An answer that includes</p> <ul style="list-style-type: none"> • Scale half grid (at least 2.5 big squares) and linear (1) • Lines straight and through all points (1) • Axis correct way round (time on x and breathing rate y)(1) • Units labelled on each axis breaths per minute or breathes /minute and minutes / eq (1) • Points correctly plotted within half a small square (1) 	<p>allow // truncated if start at 0 or y can start at 10/20</p> <p>Bar chart does not score L</p> <p>If non-linear scale between points No P</p> <p>No L if extrapolated</p> <p>even if unlabelled</p>	5

Question Number	Answer	Additional guidance	Mark
5(a)(iii)	<p>An explanation makes reference to three of the following points:</p> <ol style="list-style-type: none"> 1. (intake of) (more) oxygen /eq (1) 2. releases (more) carbon dioxide eq (1) 3. (provides more oxygen) to red cells / for muscles / for respiration / eq (1) 4. reaches maximum / stops increasing / no change / eq (1) 5. chest cannot inflate and deflate any quicker / eq (1) 	ignore slows down	3

Question Number	Answer	additional guidance	Mark
5(b)	<p>An explanation makes reference to two of the following points:</p> <ul style="list-style-type: none"> • (build-up of) lactic acid / lactate (in muscle) / eq (1) • due to anaerobic respiration/ eq (1) • <u>oxygen</u> debt / EPOC / eq (1) 	<p>break down lactic acid =MP 1 only</p> <p><u>oxygen</u> required to break down lactic acid = MP 1 and MP 3</p> <p>to oxidise lactate = MP 1 and MP 3</p>	2

Question Number	Answer	Additional guidance	Mark
5(c)	<p>An answer that includes :</p> <ul style="list-style-type: none"> • mouth / nose / face not covered / does not interfere with airflow / breathing / breathe normally / easier to breathe / breathe freely / eq (1) • muscle movement may not be breathing / other movements may be recorded / indirect measurement / shirt may be heavy / uncomfortable / affect performance / sweat may affect sensors / eq (1) 	<p>ignore no mask / affect breathing</p> <p>allow movement due to exercise (not breathing)</p>	2

Total 14 marks

Question Number	Answer	Additional guidance	Mark
6(a)	<p>An explanation that makes reference to two of the following points :</p> <p>about reproduction /life cycle</p> <ul style="list-style-type: none"> • short life span / short generation time / short life cycle / reproduce quickly / eq (1) <p>about results data</p> <ul style="list-style-type: none"> • can get many repeats / many generations / can get expected / predicted ratios / can get quick / reliable / valid results / eq (1) • have a range of visible characteristics / traits / phenotypes / eq (1) • that are inherited / controlled by genes / eq (1) 	<p>not just 10 days</p> <p>not just many offspring</p>	2

Question Number	Answer	Additional guidance	Mark
6(b)(i)	<p>An answer that makes reference to</p> <ul style="list-style-type: none"> • (parent genotypes) Ll and Ll (1) • (offspring genotypes) LL, Ll, ll (1) • (offspring phenotypes) Long and short (1) 	<p>allow any symbols</p> <p>allow Ab x Ab</p> <p>allow LS x LS</p> <p>not 4 alleles Ll Ss not X and Y</p> <p>allow parent genotypes from Punnett square</p> <p>allow ECF from incorrect parents allow genotypes and phenotypes</p>	4

	<ul style="list-style-type: none"> (phenotype ratio) / 3 long: 1 short / eq (1) 	of offspring 1 max	
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Question Number	Answer	additional guidance	Mark
6(b)(ii)	calculation method not marking points <ul style="list-style-type: none"> prob of male 0.5 / prob of long wing 0.75 combined prob = 0.375 (2) 	full marks for correct answer no working allow 1 mark for 0.5 or 50% or $\frac{1}{2}$ or 0.75 or 75% or $\frac{3}{4}$ allow 37.5% or $\frac{3}{8}$	2

Question Number	Answer	additional guidance	Mark
6(b)(iii)	<p>An answer that makes reference to four of the following points:</p> <p>male to female</p> <p>observed / actual</p> <p>1. male 155 / female 165 / 48% male / 52% female (1)</p> <p>expect</p> <p>2. expect 1:1 / 50% / same numbers / even / eq (1)</p> <p>compare</p> <p>3. almost identical / little difference / (slightly) fewer males / (slightly) more females / eq (1)</p> <p>long to short</p> <p>observed / actual</p> <p>4. long 241 / short 79 / 75% long / 25% short (1)</p> <p>expect</p> <p>5. expect 3:1 / 75% long / 25% short (1)</p> <p>compare</p> <p>6. (almost) 3:1 / little difference / eq (1)</p> <p>long /short /male / female</p> <p>7. slight difference between long to short in male and female / slightly more long winged males than expected / eq (1)</p> <p>8. 3.2 :1 for male / 76% long / 24% short (1)</p> <p>9. 2.9 :1 for female / 75% long / 25% short (1)</p>	<p>No credit for quoting unprocessed data ie 118, 37, 123, 42</p> <p>slightly fewer long winged females than expected</p>	4

Question Number	Answer	Additional guidance	Mark
6(c)	<p>An explanation makes reference to three of the following points:</p> <ul style="list-style-type: none"> • short-winged flies cannot fly / feed / mate / can't move as well / cannot escape predators / eq (1) • do not survive / die out / extinct / eq (1) • less reproduction / no alleles passed on (to next generation)/ eq (1) • natural selection / selective disadvantage eq (1) 	<p>allow converse throughout for long / normal flies</p> <p>allow genes</p>	3

total 15 marks

Question Number	Answer	Mark
7(a)(i)	<ul style="list-style-type: none"> producer / first / one / 1 (1) 	1

Question Number	Answer	Mark
7(a)(ii)	<ul style="list-style-type: none"> tertiary consumer / third consumer / fourth / four / 4 (1) 	1

	Answer	additional guidance	Mark
7(b)(i)	<p>calculation method not marking points</p> <p>diameter = 7.5 cm = 75 mm (allow 7.4-7.6cm or 74-76mm)</p> <p>75 mm = 75 × 1000</p> <p>75000 μm</p> <p>magnification = 75000 ÷ 10 μm</p> <p>= × 7500 (2) (allow 7400 to 7600) ignore units in answer line</p>	<p>full marks for correct answer no working</p> <p>1 mark for correct length <u>with correct units</u></p> <p>or</p> <p>1 mark for their measurement in μm ÷ 10</p> <p>or</p> <p>1 mark for their measurement in mm ÷ 0.01</p>	2

	Answer	additional guidance	Mark
7(b)(ii)	<p>calculation method not marking points</p> <p>radius = 5</p> <p>$4 \times (3.14 \times 125) / 3$</p> <p>= 523 allow (522 -524)(2)</p>	<p>full marks for correct answer no working</p> <p>allow 1 mark for × 125</p>	2

		if they round 4/3 to 1.33 answer will be =522	
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	Answer	additional guidance	Mark
7(b)(iii)	A description that includes two of the following points: <ul style="list-style-type: none"> • absorbs / traps (sun)light / light energy / eq (1) • photosynthesis / eq (1) • produces glucose / carbohydrate / sugar / starch / eq (1) 	ignore uses converts light energy into chemical energy scores mp 1 and mp 3	2

	Answer	Mark
7(b)(iv)	A description that includes the following points: <ul style="list-style-type: none"> • provides an energy store / energy reservoir / stores carbohydrate / eq (1) • respiration / eq (1) 	2

	Answer	additional guidance	Mark
7(c)	A description that includes four of the following points: <ul style="list-style-type: none"> • <u>quadrat</u> (1) • random / eq (1) • coordinates / grid / eq (1) • count number of individuals / plants / eq (1) • repeat / (calculate) mean / average / eq (1) • multiply by size of area / eq (1) 	use quadrats = mp 1 and 5	4

Total 14 marks

Question Number	Answer	Mark															
8(a)	<table border="1"> <thead> <tr> <th>Effect</th> <th>Name of hormone</th> <th>Name of gland</th> </tr> </thead> <tbody> <tr> <td>converts blood glucose into glycogen</td> <td>insulin (1)</td> <td>pancreas</td> </tr> <tr> <td>stimulates the development of male secondary sexual characteristics</td> <td>testosterone</td> <td>testis / eq (1)</td> </tr> <tr> <td>Increases heart rate</td> <td>adrenaline</td> <td>adrenal (1)</td> </tr> <tr> <td>maintains the uterus lining</td> <td>progesterone</td> <td>ovary / corpus luteum/ placenta (1)</td> </tr> </tbody> </table>	Effect	Name of hormone	Name of gland	converts blood glucose into glycogen	insulin (1)	pancreas	stimulates the development of male secondary sexual characteristics	testosterone	testis / eq (1)	Increases heart rate	adrenaline	adrenal (1)	maintains the uterus lining	progesterone	ovary / corpus luteum/ placenta (1)	<p>4</p> <p>one mark for each correct row</p>
	Effect	Name of hormone	Name of gland														
	converts blood glucose into glycogen	insulin (1)	pancreas														
	stimulates the development of male secondary sexual characteristics	testosterone	testis / eq (1)														
	Increases heart rate	adrenaline	adrenal (1)														
maintains the uterus lining	progesterone	ovary / corpus luteum/ placenta (1)															

Question Number	Answer	additional guidance	Mark
8(b)(i)	<p>An explanation makes reference to four of the following points:</p> <ol style="list-style-type: none"> 1. stems (grow) towards light / positively phototropic / eq (1) 2. (increase) photosynthesis / eq (1) 3. away from competition / other plants / eq (1) 4. <u>roots</u> (grow) away from light / negatively phototropic /eq (1) 5. into soil / to absorb water / minerals / named mineral / for water / for minerals / for named mineral /eq (1) 6. to anchor plant / eq (1) 	<p>allow leaves (face sun) ignore plants</p>	4

Question Number	Answer	additional guidance	Mark
8(b)(ii)	<p>An explanation makes reference to two of the following points:</p> <ol style="list-style-type: none"> 1. hours of daylight (better) indicator of season / time of year /eq (1) 2. daylight does not vary / temperature can vary (day to day) / eq (1) 3. (more hours of) daylight allow insects to see flowers / eq (1) 4. (more) insect pollination / insects pollinate in daylight / eq (1) 	eg more hours/ daylight in summer	2

total 10 marks

Question Number	Answer	additional guidance	Mark
9(a)	<p>An explanation makes reference to two of the following points:</p> <ul style="list-style-type: none"> • less (leaf) area / surface / fewer leaves / eq (1) • fewer chloroplasts / less chlorophyll /eq (1) • (less) photosynthesis / eq (1) • less carbohydrate / glucose / sugar / eq (1) 	<p>allow damages chloroplasts</p> <p>ignore no photosynthesis</p>	2

Question Number	Answer	additional guidance	Mark
9(b)	<p>An explanation makes reference to four of the following points:</p> <ol style="list-style-type: none"> 1. lasts longer / does not need reapplication / eq (1) 2. specific / does not affect food chain / other organisms / eq (1) 3. no residue on crop / not eaten by humans / does not affect humans /eq (1) 4. no bioaccumulation / biomagnification / eq (1) 5. pest does not become resistant / eq (1) 	<p>allow converse</p> <p>ignore cheaper alone</p> <p>ignore immune</p>	4

Question Number	Answer	Mark
9(c)(i)	<p>An explanation that makes reference to three of the following points:</p> <ol style="list-style-type: none"> 1. moth population rises (up to 6 months) / eq (1) 2. wasp population also rises as more moths / food is available / as eat moths / eq (1) 3. (from 6 months) moth population falls as eaten by wasp / eq (1) 4. wasp population falls as fewer moths to feed on / less food available / eq (1) 5. moth population recovers / repeats months / eq (1) 	3

	Answer	additional guidance	Mark
9(c)(ii)	<p>calculation method not marking points</p> <p>readings from graph</p> <p>2150- 850</p> <p>subtraction = 1300 (2)</p>	<p>full marks for correct answer no working</p> <p>allow 1 mark for one correct value 2150 or 850</p>	2

Question Number	Answer	additional guidance	Mark
9(c)(iii)	<p>An explanation that makes reference to two of the following points:</p> <ul style="list-style-type: none"> • some moths remain / doesn't kill all moths /eq (1) • delay to act / kill moths / slower (than chemical) / eq (1) • numbers vary with time of year / seasons / eq (1) • wasps are expensive / eq (1) • wasps may become pest / may kill other organisms / may affect food chain / farmers may not want to leave wasps in their fields / may sting farmers / eq (1) 	allow converse for chemical	2

total 13 marks

Question Number	Answer	Mark
10	<p>C use at least two temperatures differing by 3°C / eq (1)</p> <p>O same species / same plant / age / size / condition / same crop / eq (1)</p> <p>R repeat / calculate mean / use more than one glasshouse (for each temperature) / eq (1)</p> <p>M1 measure mass / weight (of crop) / mass / weight of fruit / mass / weight of grain / number of fruits / number of grains / number of leaves / size of leaves / eq</p> <p>M2 stated time period (one day plus) / eq (1)</p> <p>S1 same light (intensity) / light duration / same sun(light) / same time of year / eq</p> <p>S2 same carbon dioxide concentration / mineral ions / water / soil / pH / humidity / eq (1)</p>	6

total 6 marks