



Mark Scheme (Results)

Summer 2022

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

Question Number	Answer	Mark
1(a)(i)	<p>The only correct answer is D nucleoid</p> <p>A is not correct as it is the flagellum</p> <p>B is not correct as it is the cell membrane</p> <p>C is not correct as it is the cell wall</p>	1

Question Number	Answer	Mark
1(a)(ii)	<p>The only correct answer is B cell membrane</p> <p>A is not correct as it is a flagellum</p> <p>D is not correct as it is the nucleoid</p> <p>E is not correct as it is a plasmid</p>	1

Question Number	Answer	additional guidance	Mark
1(b)	<p>An answer that makes reference to three of the following points:</p> <ul style="list-style-type: none"> • bacterium has no chloroplasts (1) • bacterium has no nucleus (1) • bacterium has no (large) vacuole (1) • bacterium has plasmids (1) • bacterium has flagella (1) • bacterium has no mitochondria (1) 	<p>allow converse for plant cell</p> <p>ignore chlorophyll</p> <p>no credit for reference to structure A etc</p>	3

Total = 5 marks

Question Number	Answer	Mark
2(a)(i)	<p>The only correct answer is C R is the bronchus</p> <p>A is not correct as P is the lung</p> <p>B is not correct as Q is the trachea</p> <p>D is not correct as S is the bronchiole</p>	1

Question Number	Answer	Mark
2(a)(ii)	<p>An answer that makes reference to three of the following points:</p> <ul style="list-style-type: none"> • thin (walled) / one cell thick / eq (1) • moist /eq (1) • large surface area / many alveoli / eq (1) • close to capillary / good blood supply /eq (1) 	3

Question Number	Answer	additional guidance	Mark
2(b)(i)	<p>An answer that makes reference to the following points:</p> <ul style="list-style-type: none"> • increase up to 13 -20 / eq (1) • then (slow) decrease (from 13-20) / eq (1) • males higher (at each age) / females lower / eq (1) 	<p>Must make one correct reference to age to get mp 1 and 2 (and no incorrect ref)</p> <p>increase then decrease with no ages reference = 1 mark</p>	3

Question Number	Answer	Mark
2(b)(ii)	An answer that makes reference to: <ul style="list-style-type: none"> males larger / bigger / taller / more mass / more alveoli / larger lungs/ larger thorax/ stronger (internal) intercostal muscles / stronger diaphragm / eq (1) 	1

Total = 8 marks

Question Number	Answer	additional guidance	Mark
3(a)(i)	(4-16) ÷ 16 × 100 = 75 (2)	allow full marks for correct answer with no working allow 1 mark for ÷ 16 ignore sign	2

Question Number	Answer	Mark
3(a)(ii)	<ul style="list-style-type: none"> colour of light / wavelength of light / eq 	1

Question Number	Answer	additional guidance	Mark
3(a)(iii)	<ul style="list-style-type: none"> carbon dioxide / temperature / light intensity / brightness / minerals ions/ named mineral ions in water / eq (1) 	not just light allow distance of light from beaker	1

Question Number	Answer	additional guidance	Mark
3(b)	<p>An answer that makes reference to four of the following points:</p> <ul style="list-style-type: none"> • number of bubbles in one minute gives the rate of photosynthesis / eq (1) • high(est) in white light /eq (1) • as provides all colours / wavelengths /eq (1) • low(est) in green /eq (1) • as green light reflected / not absorbed / eq (1) • by chlorophyll / chloroplasts /eq (1) • red / blue higher than green / red/blue less than white /eq (1) • as red / blue absorbed (1) 	<p>Allow highest photosynthesis or highest bubbles/ eq for mp 2 4 7</p>	4

Question Number	Answer	Additional guidance	Mark
3(c)	<p>An explanation that makes reference to four of the following points:</p> <ul style="list-style-type: none"> • leaf flat / wide / large SA for diffusion / gas exchange / light absorption / eq (1) • leaf thin so no cells far from surface to absorb light / short diffusion distance / eq (1) • upper epidermis transparent to allow light through / eq (1) • palisade (mesophyll) (cells) contain many chloroplasts / much chlorophyll (near surface) to absorb light /eq (1) • spongy (mesophyll) (cells) have air spaces / not tightly packed / for gas exchange / diffusion /eq (1) • stomata / pores to absorb carbon dioxide/ eq (1) • xylem / vascular bundle / veins bring water (for photosynthesis) / eq (1) 	<p>Each mp must have explanation as to how it benefits photosynthesis</p>	4

Total =12 marks

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

Question Number	Answer	additional guidance	Mark
4(b)(i)	<p>A description that makes reference to three of the following points:</p> <ul style="list-style-type: none"> • measure out one m² / use quadrat / eq (1) • place randomly / eq (1) • cut / harvest grass / remove plants / eq (1) • repeat / use quadrats /eq (1) • measure mass/ weight after one year / eq (1) 	<p>allow crops</p> <p>not repeat several times a year</p> <p>allow find difference between start and end of year idea</p>	3

Question Number	Answer	Additional guidance	Mark
4(b)(ii)	<p>An answer that makes reference to 5 of the following points:</p> <ul style="list-style-type: none"> • S y axis scale linear and half the grid (1) • axis labelled (mean) net primary productivity (1) • Units in g per m²/ eq (1) • P bars plotted correctly within one (1) • K key / each bar labelled with ecosystem type (1) 	<p>line graph scores 4 max</p> <p>if scale non-linear no S or P</p>	5

Question Number	Answer	additional guidance	Mark
4(b)(iii)	<p>An answer that makes reference to five of the following points:</p> <ul style="list-style-type: none"> • tropical rainforest high(est) productivity / growth / eq (1) • high temperature / sunlight / rainfall / water/ eq (1) • desert low(est) growth / eq (1) • too little water / rain / dry eq (1) • too hot / extremes of temperature / enzymes denature / eq (1) • for photosynthesis (1) • deciduous temperate forest high / second highest / eq (1) • not as warm / less intense sunlight / less leaves in autumn / more diverse / range of plants eq(1) • cultivated farmland higher than / similar to (temperate) grassland / eq (1) • contain similar plants / grasses / cereals / no trees / eq (1) • cultivated is given water / minerals/ fertiliser / grown in polythene tunnels / eq (1) 		5

Total 14 marks

Question Number	Answer	Mark
5(a)	<p>An answer that makes reference to two of the following points:</p> <ul style="list-style-type: none"> • large petals / coloured petals /flowers / eq (1) • scented / eq (1) • nectaries / nectar (1) • enclosed stamens / enclosed stigma / sticky stigma / eq (1) 	<p>2</p> <p>Allow smell</p>

Question Number	Answer	Additional guidance	Mark
5(b)(i)	<p>An explanation that makes reference to two of the following points:</p> <ul style="list-style-type: none"> • has no stamens / anthers / no male part /eq (1) • no pollen produced / male gamete / eq (1) • no fertilisation / pollination / eq (1) 	Allow converse	2

Question Number	Answer	additional guidance	Mark
<p>5(b)(ii)</p> <p>CLIP WITH 5(b)(iii)</p>	<p>An answer that includes :</p> <ul style="list-style-type: none"> • parent genotypes Dd (1) • correct gametes shown D or d (1) • correct offspring genotypes shown DD Dd Dd dd (1) • correct offspring phenotypes shown / ratio shown or key shown/eq (1) 	<p>allow other symbols</p> <p>allow all 4 marks from suitable Punnett square</p> <p>allow ECF for 2 max gametes and offspring genotypes from any parents</p>	4

Question Number	Answer	additional guidance	Mark
5(b)(iii) CLIP WITH 5(b)(ii)	0.25 / ¼ / 25% of 600 = 150 (2)	allow full marks for correct answer with no working allow 1 mark for 0.25 / ¼ / 25% allow ecf from (b) (ii) so if offspring shown in 5bii are 50% double allow 300 as answer here.	2

Total 10 marks

Question Number	Answer	Mark
6(a)	bacteria that contain added genes / additional DNA / added genetic information / genes from another species / DNA from another species / foreign genes / foreign DNA / genetic information from another species / eq (1)	1

Question Number	Answer	Mark
6(b)	A description that makes reference to four of the following points: <ul style="list-style-type: none"> • restriction enzyme used (1) • to cut human DNA / gene (that codes) for insulin / to cut plasmid (1) • produces sticky ends /eq (1) • ligase used to (1) • insert gene / join DNA into bacterial plasmid / eq (1) • plasmid inserted into bacterium / eq (1) 	4

Total 5 marks

Question Number	Answer	additional guidance	Mark
7	<p>An answer that makes reference to six of the following points</p> <ul style="list-style-type: none"> • C use weights and running (1) • O use same sex / same age / same fitness / same resting heart rate / or matched individuals / same number of males and females /eq (1) • R repeat / use groups (for each training regime) / eq (1) • M1 measure (resting) heart rate / count beats per minute / eq (1) • M2 after stated duration of programme / 1 week plus / eq (1) • S1 equivalent same duration / time of exercise / frequency of exercise / eq (1) • S2 same environmental conditions during exercise / temperature / clothing / humidity / altitude / eq (1) 	Not same person	6

Total 6 marks