



Mark Scheme (Results)

Summer 2024

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

Question Number	Answer	Mark
1(a)(i)	<p>The only correct answer is A structure Q</p> <p><i>B is not correct as R is the bronchus</i></p> <p><i>C is not correct as S is the alveolus</i></p> <p><i>D is not correct as T is the pleural membrane</i></p>	1

Question Number	Answer	Mark
1(a)(ii)	<p>The only correct answer is C structure S</p> <p><i>A is not correct as Q is the trachea</i></p> <p><i>B is not correct as R is the bronchus</i></p> <p><i>D is not correct as T is the pleural membrane</i></p>	1

Question Number	Answer	Mark
1(a)(iii)	<p>The only correct answer is B Q and R</p> <p><i>A is not correct as P and Q do not both contain cartilage rings</i></p> <p><i>C is not correct as Q and S do not both contain cartilage rings</i></p> <p><i>D is not correct as S and T do not both contain cartilage rings</i></p>	1

Question Number	Answer	Additional guidance	Mark
1(b)(i)	<ul style="list-style-type: none"> (healthy) lung is larger / bigger / not collapsed/ not shrunk / no air in thorax /lung not detached from chest wall / no hole in chest wall / eq (1) 	(Pneumothorax) lung is smaller / lung is collapsed / shrunk / air in thorax / lung detached from chest wall/ hole in chest wall	1

Question Number	Answer	Additional guidance	Mark
1(b)(ii)	<p>An answer that makes reference to four of the following points:</p> <ol style="list-style-type: none"> 1. chest cavity / thorax not sealed / airtight / air enters / escapes thorax through hole / eq (1) 2. as chest / thorax volume / increases / changes / eq(1) 3. pressure cannot change / no pressure / eq (1) 4. lung cannot inflate / lung cannot expand / no air drawn in / less air enters / eq (1) 5. only one lung works / harder to breathe / short of breath / cannot inhale / eq (1) 6. no / less gas exchange / diffusion of oxygen / eq (1) 	not air enters lung	4

Total = 8 marks

Question Number	Answer	Mark
2(a)(i)	<p>The only correct answer is C rabbit</p> <p><i>A is not correct as the cactus is not a primary consumer</i></p> <p><i>B is not correct as the lizard is not a primary consumer</i></p> <p><i>D is not correct as the tarantula is not a primary consumer</i></p>	1

Question Number	Answer	Mark
2(a)(ii)	<p>The only correct answer is C rattlesnake</p> <p><i>A is not correct as the lizard is not a tertiary consumer</i></p> <p><i>B is not correct as the rabbit is not a secondary or tertiary consumer</i></p> <p><i>D is not correct as the tarantula is not a tertiary consumer</i></p>	1

Question Number	Answer	Mark
2(b)(i)	<p>An explanation that makes reference to two of the following points:</p> <ul style="list-style-type: none"> • hawk population falls / eq (1) • less food available / as they eat rabbits / eq (1) <p style="text-align: center;">or</p> <ul style="list-style-type: none"> • no change / little change / eq (1) • as the hawks eat more lizards / kangaroo rats /eq (1) 	2

Question Number	Answer	Additional guidance	Mark
2(b)(ii)	<p>A description that makes reference to four of the following points:</p> <ol style="list-style-type: none"> 1. white blood cells (1) 2. lymphocytes (1) 3. (lymphocytes) produce antibodies / antitoxins / eq (1) 4. phagocytes (1) 5. (phagocytes) engulf/ surround / eat bacteria / phagocytosis / eq (1) 	<p>allow white blood cells produce antibodies no mp 3 for phagocytes produce antibodies</p> <p>allow white blood cells engulf no mp 5 for lymphocytes engulf</p>	4

Total = 8 marks

Question Number	Answer	Mark
3(a)(i)	<ul style="list-style-type: none"> absorb carbon dioxide / eq (1) 	1

Question Number	Answer	Mark
3(a)(ii)	<p>An explanation that makes reference to the following points:</p> <ul style="list-style-type: none"> prevent release of carbon dioxide / eq (1) (from respiration) by soil organisms / eq (1) 	2

Question Number	Answer	Additional guidance	Mark
3(b)	<ul style="list-style-type: none"> prevents carbon dioxide entering from outside bell jar / keeps carbon dioxide out /eq (1) 	ignore stops CO ₂ escaping / leaving	1

Question Number	Answer	Additional guidance	Mark
3(c)	<p>A description that makes reference to four of the following points:</p> <ol style="list-style-type: none"> place leaf in boiling water / boil leaf in water / eq(1) place leaf in boiling ethanol / ethanol at 70°C / boil leaf in ethanol /eq (1) using water bath / extinguish Bunsen flame / ethanol is flammable / eq (1) remove chlorophyll / green colour from leaf / colourless leaf / eq (1) add iodine (solution) / eq (1) blue / black colour starch present / eq (1) 	allow purple	4

Question Number	Answer	Mark
3(d)	<p>A description that makes reference to two of the following points:</p> <ol style="list-style-type: none"> 1. same plant / similar plant / same sized / same mass of plant / same species of plant / same age of plant / eq(1) 2. same light / in sun / same conditions / same water/ same temperature / same time / eq (1) 3. no (potassium) hydroxide in bell jar / not in bell jar / outside / with carbon dioxide / eq (1) 	2

Total = 10 marks

Question Number	Answer	Mark
4(a)	<ul style="list-style-type: none"> • W vena cava / superior vena cava / main vein (1) • X aorta (1) • Y pulmonary artery (1) • Z pulmonary vein (1) 	4

Question Number	Answer	Mark
4(b)	<p>An answer that makes reference to:</p> <ul style="list-style-type: none"> • separates / a barrier between / prevents mixing of oxygenated and deoxygenated blood / eq (1) 	1

Question Number	Answer	additional guidance	Mark
4(c)(i)	<p>An answer that includes:</p> <p>Calculation method not marking points</p> <p>$(2.27 - 1.74) = 0.53$</p> <p>$0.53 \div 1.74 \times 100$</p> <p>$= 30.5\%$ (2)</p>	<p>allow 1 mark for 0.53 or 2.27-1.74</p> <p>allow 30.46 or 30.460 30.4598 30.45978 30.459770 30.4597701 30.45977011 for 2 marks</p>	2

Question Number	Answer	additional guidance	Mark
4(c) (ii)	<p>An answer that makes reference to five of the following:</p> <ol style="list-style-type: none"> 1. better to give up completely / eq (1) 2. large study / reliable / repeatable / significant / results / eq (1) 3. no information on age / mass / blood pressure / health / no information on exercise / fitness / eq (1) 4. no information on how long each person smoked for / whether they have smoked in the past / eq (1) 5. increased risk higher in women (for heart disease and stroke) (1) 6. little difference in risk between 1 cigarette and 20 / still a big increased risk with 1 / for heart and stroke / eq (1) 7. greater difference in women than men between 1 and 20 cigarettes (for heart disease and stroke) / eq (1) 8. increased risk higher for heart disease than for stroke (in men and women) / eq (1) 9. smoking one cigarette per day may lead to increased smoking later / eq (1) 10. smoking is addictive / may find it easier to cut down / contains nicotine / better to reduce that do nothing / eq (1) 11. smoking reduces oxygen levels in blood /eq (1) 	<p>It is true.</p> <p>credit manipulated data ie 4 x in women but (only) 2 times in men.</p> <p>greater difference between 0 and 1 (converse)</p> <p>allow converse</p> <p>allow converse</p> <p>allow ref to nicotine patches</p>	5

Total = 12 marks

Question Number	Answer	additional guidance	Mark
5(a)	<p>An answer that makes reference to the following points:</p> <ul style="list-style-type: none"> parent genotypes Pp x Pp (1) correct gametes for parents P or p and P or p (1) offspring genotypes PP Pp pp (1) phenotypes Purple PP Pp and yellow pp (allow from 3:1 ratio) (1) 	<p>allow other symbols not x and y</p> <p>allow full marks from Punnet square</p> <p>gametes must be clearly shown separated or in circles or in Punnet square</p> <p>allow ecf for wrong parent genotypes gametes and offspring mark for 2 max</p>	4

Question Number	Answer	additional guidance	Mark
5(b)	<p>An answer that includes:</p> <p>Calculation method not marking points</p> <p>total offspring = 1453 + 462 = 1915</p> <p>1915 - 1453 = 462</p> <p>ratio 1453 ÷ 462</p> <p>= 3.145:1 or 3.15:1 or 3.1:1</p>	<p>allow 1 mark for</p> <p>1453 and 462</p>	2

Question Number	Answer	additional guidance	Mark
5(c)	An answer that includes : Calculation method not marking points $1915 \div 4$ $= 478.75$ 3×478.75 $= 1436$ or 1436.25 or 1436.3 or 1436.4 or 1437 (2)	allow 1 mark for 478.75 or 478.8 or 479 Or x 3	2

Question Number	Answer	additional guidance	Mark
5(d)	An explanation that includes the following: <ul style="list-style-type: none"> • fertilisation / which gametes fuse / eq (1) • random /due to / by chance / to chance / not exact ratio / probability / every time /eq (1) 	random fertilisation = 2 marks	2

Total = 10 marks

Question Number	Answer	Mark
6(a)	<p>A description that makes reference to four of the following points:</p> <ol style="list-style-type: none"> 1. restriction enzyme used to cut selected gene / DNA / eq (1) 2. (same) restriction enzyme used to cut plasmid / eq (1) 3. producing sticky ends / complementary bases /eq (1) 4. ligase enzyme used to join DNA / genes / put DNA / genes into plasmid /eq (1) 5. plasmid inserted into bacterium / taken up by plant cell / eq (1) 6. ref to plasmid from <i>Agrobacterium</i> / gene gun / eq (1) 	4

Question Number	Answer	additional guidance	Mark
6(b)(i)	<p>An answer that makes reference to the following :</p> <ul style="list-style-type: none"> • containing gene / DNA from other species / from two species / from a different species / foreign genes / foreign DNA / eq (1) 	Not just another organism	1

Question Number	Answer	additional guidance	Mark
6(b)(ii)	<p>Increased yield / size / mass / frost resistant / drought resistant / pesticide resistant / herbicide resistant / insect resistant / pest resistant / taste/ nutrition / disease resistant / improved shelf life / eq (1)</p>	allow other suitable examples eg golden rice	1

Total = 6 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 change exercise / different levels of exercise or activity to change heart rate / breathing rate / eq (1) • O use same person / same age / same sex/ fitness / eq (1) • R repeat with different people / repeat with same person / eq (1) • M1 measure heart rate / count beats per minute / use heart monitor / eq (1) • M2 measure breathing rate / count breaths per minute / use breathing rate monitor / eq (1) • S1 for / in same / stated duration / amount / laps / period of exercise / eq (1) • S2 control temperature / oxygen availability / type of exercise / eq (1) 	<p>not just change breathing rate need to explain how</p>	6

Total 6 = marks