



Mark Scheme (Results)

November 2021

Pearson Edexcel International GCSE
In Biology (Single Award) (4SSO) Paper 1B

Question Number	Answer	Mark
1(a)	C uterus / womb / uterine wall / uterine lining / uterus lining /endometrium (1) D vagina (1)	2

Question Number	Answer	Mark
1(b)	A description that makes reference two the following points: <ul style="list-style-type: none"> • site of fertilisation / fusion (1) • egg travels / egg from ovary / transports egg /eq (1) • sperm travels (from vagina/ uterus /cervix/ to egg) / transports sperm / eq (1) 	2

Question Number	Answer	additional guidance	Mark
1(c)	An explanation that makes reference to two of the following points: <ul style="list-style-type: none"> • produces oestrogen / eq (1) • at puberty (1) • example of <u>named</u> secondary sexual characteristic /eq(1) • second example of <u>named</u> secondary sexual characteristic /eq (1) 	examples pubic hair/ breasts develop/ body hair / hips widen / menstruation <u>starts</u>	2

Total = 6 marks

Question Number	Answer	additional guidance	Mark
2(a)	<ul style="list-style-type: none"> • oak → caterpillar → mouse → tick (1) 	no credit for other chains without correct arrows pyramids	1 grad

Question Number	Answer	Mark
2(b)	<p>An explanation that makes reference to two the following points:</p> <ul style="list-style-type: none"> • less food (for mice) / eq (1) • mice can (now only) feed on tree (1) • mice population declines / fewer mice / it declines / eq (1) 	2

Question Number	Answer	Mark
2(c)	<p>An explanation that makes reference to three of the following points:</p> <ul style="list-style-type: none"> • energy loss / used up (at each trophic level) / not all energy transferred /less energy reaches top / eq (1) • respiration / heat loss / movement (1) • cannot digest / egested / not absorbed /eq (1) • uneaten / die / decomposition (1) • excretion / eq (1) 	3

Total = 6 marks

Question Number	Answer	additional guidance	Mark
3(a)	<ul style="list-style-type: none"> • (the allele coding for) grey 	<p>allow grey mouse allow grey male mouse</p>	1

Question Number	Answer	additional guidance	Mark
3(b)(i)	<p>An answer that makes reference to the following points:</p> <ul style="list-style-type: none"> parent genotypes aa x Aa (1) correct gametes for parents a and a or A (1) offspring genotypes aa and Aa (1) phenotypes white (aa) and grey (Aa) (1) 	<p>allow G and W</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
3(b)(ii)	<p>an answer that makes reference to one of the following:</p> <ul style="list-style-type: none"> fertilisation is random / combination of gametes is random / eq (1) due / by chance / to chance / eq (1) 	<p>it is a probability doesn't happen every time</p>	1

Question Number	Answer	additional guidance	Mark
3(b)(iii)	<ul style="list-style-type: none"> probability of male 0.5 / eq probability of white 0.5/eq <p>so combined = 0.5×0.5</p> <p>0.25 / 25% / $\frac{1}{4}$ (2)</p>	<p>allow 1 mark for 0.5 /eq</p> <p>full marks for correct answer no working</p>	2

Question Number	Answer	additional guidance	Mark
3(c)	<p>A description that makes reference to three of the following points:</p> <ul style="list-style-type: none"> white blood cells (1) phagocytes (1) (phagocytes) ingesting / engulfing / pathogens / eq (1) lymphocytes (1) (lymphocytes) releasing antibodies (1) 	<p>phagocytes release antibodies scores mp 2 but not mp5</p> <p>white blood cells produce antibodies scores mp1 and mp 5</p>	3

Total 11 marks

Question Number	Answer	Mark
4(a)	<p>The only correct answer is C producers</p> <p>A is not correct as it is not decomposers</p> <p>B is not correct as it is not primary consumers</p> <p>D is not correct as it is not secondary consumers</p>	1

Question Number	Answer	Mark
4(b)	<p>The only correct answer is</p> <p>C $6\text{CO}_2 + 6\text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$</p> <p>A is not correct as it is not photosynthesis</p> <p>B is not correct as it is not photosynthesis</p> <p>D is not correct as it is not photosynthesis</p>	1

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"> • so that starch is used up / no starch present / remove starch / destarch / no starch made / eq (1) • in respiration (1) • prevent photosynthesis (1) 	<p>to show that any starch present is the product of photosynthesis in the light</p> <p>scores mp 1 and mp3</p>	2

Question Number	Answer	Mark
4(c)(ii)	<p>A description that makes reference to two of the following points:</p> <ul style="list-style-type: none"> • use water bath / eq (1) • extinguish Bunsen flame / no contact with flame / eq (1) • as ethanol flammable / eq (1) 	2

Question Number	Answer	Mark
4(c)(iii)	leaf from light turns blue black / blue / black / purple and leaf from dark stays brown / yellow orange / no change /eq (1)	1

Total 7 marks

Question Number	Answer	Mark
5(a)(i)	The only correct answer is C structure S A is not correct as P is not part of digestive system B is not correct as Q is not part of digestive system D is not correct as U is not part of digestive system	1

Question Number	Answer	Mark
5(a)(ii)	The only correct answer is D structure U A is not correct as P is not part of circulation system B is not correct as R is not part of circulation system D is not correct as S is not part of circulation system	1

Question Number	Answer	Mark
5(b)	The only correct answer is B diaphragm contracts and the volume within the rib cage increases A is not correct as volume within the rib cage does not decrease C is not correct as diaphragm does not relax D is not correct as diaphragm does not relax	1

Question Number	Answer	Additional guidance	Mark
5(c)(i)	<ul style="list-style-type: none"> oxygen 20% (1) carbon dioxide 9900% (1) 	$(40/200) \times 100 = 20\%$ $(39.6/0.4) \times 100 = 9900$ one mark for each correct %	2

Question Number	Answer	Mark
5(c)(ii)	<p>An explanation that makes reference to four of the following points:</p> <ul style="list-style-type: none"> more carbon dioxide in exhaled air / eq (1) as produced by / released from respiration (in cells) (1) transported in (red cells and plasma) to lungs / eq (1) less oxygen in exhaled air / eq (1) as absorbed by red blood cells / absorbed by lungs / eq (1) as used / required in respiration (in cells) (1) little change/ no change in Nitrogen (as not absorbed / not required) (1) 	4

Question Number	Answer	Mark
5(c)(iii)	<p>An explanation that makes reference to four of the following points</p> <ul style="list-style-type: none"> • (many) <u>alveoli</u> provide large surface area /eq (1) • blood flow / blood supply / capillaries / maintain(s) diffusion / concentration <u>gradient</u> / eq (1) • <u>capillaries</u> provide blood supply / surround / close to alveoli/ eq (1) • thin (walls) one cell thick / short distance for <u>diffusion</u> eq (1) • moist lining to allow gases to dissolve / pass through / for gas exchange /eq (1) 	4

Total 13 marks

Question Number	Answer	additional guidance	Mark
6(a)	movement of a substance / molecules / particles / ions from a region of high concentration to a region of lower concentration / down a concentration gradient / eq	ignore ref to partially permeable	1

Question Number	Answer	additional guidance	Mark
6(b)	<p>An answer that refers to two of</p> <ul style="list-style-type: none"> • temperature (1) • concentration of dye (1) • density / thickness / concentration / solidity of / type of agar / jelly eq (1) • volume of dye (1) 	<p>ignore time</p> <p>ignore amount of dye</p>	2

Question Number	Answer	additional guidance	Mark
6(c)(i)	$SA = 6 \times SA \text{ of one side}$ $6 \times 2 \times 2$ 6×4 <ul style="list-style-type: none"> • $24 \text{ cm}^2 (2)$ 	allow 1 mark for $\times 4$ or $\times 2 \times 2$ allow full marks for correct answer with no working	2

Question Number	Answer	additional guidance	Mark
6(c)(ii)	<ul style="list-style-type: none"> • 3:1 / eq 	allow 3 allow ECF from 6ci	1

Question Number	Answer	additional guidance	Mark
6(c)(iii)	2 (mm)	allow 1-2 (mm)	1

Question Number	Answer	additional guidance	Mark
6(c)(iv)	<p>An answer that makes reference to four of the following points:</p> <ul style="list-style-type: none"> • dye moves (into each cube) same distance / eq (1) • but smaller cube (C) has greater proportion penetrated / eq (1) • as small cube (C) has higher surface area to volume ratio / eq (1) • as size decreases SA / vol ratio increases (1) • so smaller organisms are more efficient / can rely on diffusion (alone) / diffusion more effective / eq (1) • larger organisms need circulation system / transport system / ventilation / lungs / digestive system / eq (1) 	<p>allow converse mp 2 3 4 5 6</p>	4

Total 11 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 carbon dioxide concentration / eq (1) • O use same plant species / same seeds / same variety /eq (1) • R repeat for each carbon dioxide concentration / eq (1) • M1 measure height / mass / yield of crop / number of fruit / eq (1) • M2 after stated time / same time (1) • S1 use same temperature / stated temperature / eq (1) • S2 water / minerals / nitrates / compost /soil / light intensity / period / eq (1) 	<p>ignore amount unqualified</p> <p>4 weeks plus</p>	6

Total 6 marks