



Mark Scheme (Results)

November 2025

Pearson Edexcel International GCSE in Biology
4WB11/1B

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General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

Question Number	Answer	Mark
1(a)(i)	D (S) <i>A is not the answer as P is a vacuole</i> <i>B is not the answer as Q is the cytoplasm</i> <i>C is not the answer as R is the cell membrane</i>	1

Question Number	Answer	Mark
1(a)(ii)	B (Q) <i>A is not the answer as P is a vacuole</i> <i>C is not the answer as R is the cell membrane</i> <i>D is not the answer as S is the nucleus</i>	1

Question Number	Answer	Mark
1(a)(iii)	D (S) <i>A is not the answer as P is the vacuole</i> <i>B is not the answer as Q is the cytoplasm</i> <i>C is not the answer as R is the cell membrane</i>	1

Question Number	Answer	Additional guidance	Mark
1(a)(iv)	Calculation method not marking points line length = 43 (mm) 43 mm = $43 \times 1000\mu\text{m}$ Actual size = image size / magnification $43\,000 \div 65$ = 660 (μm) (2)	1 mark for correct length and units 43 to 44 mm or 4.3 to 4.4 cm OR for $\div 65$ some candidates may use 4,3 cm allow as 4.3cm Allow 660 to 677 (2)	2

Question Number	Answer	Additional guidance	Mark
1(b)	An answer that that makes reference to three of the following: 1. <i>Amoeba</i> larger (1) 2. <i>Amoeba</i> has nucleus / eq (1) 3. <i>Amoeba</i> has cytoplasm / eq (1) 4. <i>Amoeba</i> has organelles/ eq (1) 5. <i>Amoeba</i> has cell membrane (1) 6. Virus has protein coat / capsid / envelope / eq (1) 7. Amoeba has chromosomes / DNA and RNA / virus has DNA or RNA / eq (1)	Allow converse Assume it = <i>Amoeba</i> allow one example mitochondrion /vacuole / ribosomes	3

(Total for Question 1 = 8 marks)

Question Number	Answer	Additional guidance	Mark
2(a)	• lipid(s) / fat(s) / oil(s) (1) • water (1) • fibre(s) (1)	Accept in any order Accept cellulose	3

Question Number	Answer	Additional guidance	Mark
2(b)	peristalsis	peristaltic (movement) accept phonetic spelling e.g. perystalsis peristasis	1

Question Number	Answer	Additional guidance	Mark
2(c)	One from 1. large surface area (1) 2. large SA/V ratio (1) 3. folded (walls) (1) 4. long (1) 5. good blood supply / lacteals (1) 6. villi / thin villus walls / one cell thick endothelium/walls (of villi) (1) 7. microvilli (1)	it = ileum Ignore thin / thin walls/thick walls/cell walls if referring to ileum / it	1

Question Number	Answer	Additional guidance	Mark
2(d)(i)	rectum (1)	Ignore faeces Ignore large intestine Reject anus / colon	1

Question Number	Answer	Additional guidance	Mark
2(d)(ii)	One pair from - large surface / large area / large surface area to volume ratio / large SA/V (1) - absorbs water / prevents dehydration OR - large surface / large area large surface area to volume ratio / large SA/V (1) - to absorb salts/minerals (1)	Accept reabsorbs water Ignore stores water Accept named mineral Ignore nutrients Accept contains bacteria so that fibre / cellulose	2

		digested for 2 marks Ignore stores faeces / villi / transports food to rectum / absorbs digested food	
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(Total for Question 2 = 8 marks)

Question Number	Answer	Mark
3(a)(i)	An explanation that makes reference to two of the following • show no starch present / starch is used up / leaf is destarched / eq (1) • by respiration / eq (1) • to make it a fair test / make test valid / any starch produced is from photosynthesis / eq (1)	2

Question Number	Answer	Additional guidance	Mark
3(a)(ii)	An explanation makes reference to two of the following • no photosynthesis / no carbon dioxide / eq (1) • no carbohydrate / no starch / negative /eq (1)	Accept requires carbon dioxide / CO₂ for photosynthesis	2

	iodine solution unchanged / leaf brown / yellow / orange /eq (1)		
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Question Number	Answer	Additional guidance	Mark
3(a)(iii)	A description that includes the following - plant in dark / leaf with foil covering / leaf with stencil / eq (1) - access to CO₂ / no soda lime / eq (1)		2

Question Number	Answer	Additional guidance	Mark
3(b)	An explanation that includes three of the following - photosynthesis only provides C H O / other <u>elements</u> required for growth / eq (1) - nitrate required for amino acids / proteins / enzymes / new cells / eq (1) - magnesium required for chlorophyll / chloroplasts / for photosynthesis / eq (1) - phosphate for ATP /cell membranes / DNA / eq (1)	no credit for nitrogen no credit for phosphorous Allow iron for chlorophyll / chloroplasts / photosynthesis /respiration (1) calcium for cell walls/cell membranes (1) potassium for	3

		water balance / enzymes /photosynthesis /respiration (1)	
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Question Number	Answer	Additional guidance	Mark
3(c)	An explanation that includes three of the following: • upper epidermis / upper layer so light passes through / transparent / eq (1) • waxy layer so reduces water loss / eq (1) • cells arranged vertically / packed together so absorbs most light /eq (1) • contains chloroplasts / chlorophyll so traps light / absorbs light energy / eq (1) • near upper surface so more light penetrates / reaches / eq (1)	adaptation and how it helps ignore region A	3

(Total for Question 3 = 12 marks)

Question Number	Answer	Additional guidance	Mark
4(a)	glucose $\longrightarrow$ ethanol and carbon dioxide	one mark for each side no credit for glucose + oxygen on LHS allow correct formula for reactants and products	2

Question Number	Answer	Mark
4(b)(i)	Mass of seeds / volume of seeds / species of seeds / type of seeds / size of seeds / age of seeds /eq (1)	1

Question Number	Answer	Additional guidance	Mark
4(b)(ii)	Calculation method, not marking points 1108 – 564 = 544 5.44 ÷ 180 = 3.0 (2)	full marks for correct answer allow 1 mark for 544 or ÷ 180 allow 544 from table allow 3 or 3.02 or 3.022 allow from table	2

Question Number	Answer	Additional guidance	Mark
4(b)(iii)	An answer that makes reference to five of the following 1. high CO₂ / most change (in CO₂) produced in respiring seeds / eq (1) 2. low CO₂ / less change (in CO₂) / produced in dry seeds / eq (1) 3. no change (in CO₂) normal air / eq (1) 4. as dry seeds are not respiring / respiring very slowly / eq (1) 5. enzymes are not active / less active / (in dry seeds) eq (1) 6. no water for chemical / metabolic reactions / hydrolysis (in dry seeds) / eq (1) 7. experiment not repeated / not reliable / eq (1) 8. only done for short period / 3 minutes / eq (1) 9. temperature not controlled / not stated / eq (1) 10. could be aerobic or anaerobic / eq (1)	Allow slightly higher change in CO₂ than when no seeds Ignore respiration	5

(Total for Question 4 = 10 marks)

Question Number	Answer	Mark
5(a)(i)	A (alveolus) <i>B is incorrect as structure S is not a bronchiole</i> <i>C is incorrect because structure S is not a bronchus</i> <i>D is incorrect because S is not the trachea</i>	1

Question Number	Answer	Additional guidance	Mark
5(a)(ii)	pleura/pleural (membranes)	Ignore cavity/fluid Accept phonetic spelling e.g. plural,plureal	1

Question Number	Answer	Additional guidance	Mark
5(a)(iii)	A description that makes reference to four of the following: (diaphragm/R) contracts / flattens /goes down /straightens /eq (1) (external) intercostal muscles contract (1)	Reject diaphragm relaxes/domes ignore internal intercostals relax reject internal intercostals contract	4

	3. rib cage up and out (1)	reject up and in /down and out	
	4. increase volume of thoracic cavity / thorax / lungs (1)		
	5. decreases pressure / air pushed in / air enters down pressure gradient (1)	ignore air diffuses in / oxygen enters	

Question Number	Answer	Additional guidance	Mark
5(b)	One from (increased risk of) - CHD / CVD / heart attack / stroke / high blood pressure / hypertension / narrowing of blood vessels / atherosclerosis (increased risk of) cancer / named cancer - asthma / bronchitis / emphysema / COPD / decrease in SA of alveoli	Ignore nicotine addiction damage to heart heart problems Accept carbon monoxide/CO binds to Hb and reduces oxygen-carrying capacity of (red) blood (cells) /of Hb Accept any named cancer Accept good descriptions of the conditions Ignore lung disease /respiratory	1

		disease/alveoli damage / lung damage / difficulty breathing	
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Question Number	Answer	Additional guidance	Mark
5(c)(i)	2013 / 2013-14 (1)	Accept end of 2013 to beginning of 2014 Reject 2014	1

Question Number	Answer	Additional guidance	Mark
5(c)(ii)	4.5 (:1) (1) (Calculation $27 \div 6$)	Accept any number between 4.5 and 4.7 Allow any number of dp that round to number within the range 4.5 to 4.7	1

Question Number	Answer	Additional guidance	Mark
5(c)(iii)	Any two of the following: • decreases / falls /(eq) (1) • goes up and down / varies / fluctuates / eq (1) • data quote / data manipulation (1)	Accept levels off after 2021 / at end no change after 2021 sharper drop after 2010 eq e.g. two percentages and two years or two % values over 15 years /specified years	2

(Total for Question 5 = 11 marks)

Question Number	Answer	Mark
6(a)(i)	A (contains chlorophyll for photosynthesis) <i>B is incorrect because X is a chloroplast not a mitochondrion</i> <i>C is incorrect because structure X is not the nucleus. It contains some genes but not all of the genetic information of the cell</i> <i>D is incorrect because the vacuole, not X, stores water, some nutrients and waste</i>	1

Question Number	Answer	Additional guidance	Mark
6(a)(ii)	cellulose	Accept phonetic spelling but Reject cellulase Accept beta cellulose Accept polymer of (beta) glucose Ignore cell wall /carbohydrate	1

Question Number	Answer	Mark
6(a)(iii)	B (water enters the cell by osmosis) <i>A is incorrect because water does not enter by active transport</i> <i>C is incorrect because water has not left the cell</i> <i>D is incorrect because water has not left the cell</i>	1

Question Number	Answer	Mark
6(b)	D (sugar solution) <i>A is incorrect because the cell wall is fully permeable and the sugar solution enters by diffusion so there is no air</i> <i>B is incorrect because cytoplasm remains within the boundaries of the cell surface membrane</i> <i>C is incorrect because the cell is immersed in sugar solution</i>	1

Question Number	Answer	Additional guidance	Mark
6(c)(i)	chlorophyll	Ignore chloroplasts Accept phonetic spelling	1

Question Number	Answer	Additional guidance	Mark
6(c)(ii)	A response that includes six from C (two fields/glasshouses/plots/soils) one with normal soil and one with added magnesium sulfate (1) O same species / type / age / size / number sorghum plants / seeds(1) R repeats (for each field / plot)/ find means (for each field /plot) (1) M₁ method to measure yield e.g. mass of seeds / number of seeds (1)	Accept Different amounts of magnesium sulfate only if one has no magnesium sulfate Ignore	6

	M₂ suitable stated time - at least 2 months to 1 year / a season (1) S₁ same light intensity / same exposure to light / same time of year (1) S₂ same carbon dioxide / temperature / water / humidity /pH/ other named mineral (1)	plant height / mass/no of leaves	
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(Total for question 6 = 11 marks)

Question Number	Answer	Additional guidance	Mark
7(a)	1. (tube A) respiration (only) (1) 2. (tube B) (more) photosynthesis and (less) respiration (1) 3. (tube C) respiration (only) (1) 4. (tube D) (much more) respiration (from animals and plants and no photosynthesis) / eq (1)	ignore gas exchange throughout	4

Question Number	Answer	Additional guidance	Mark
7(b)	indicator solution only / with no living organisms in the light / no foil (1) OR	Reject If they include any organisms (in both cases)	1

	indicator solution only / with no living organisms in the dark /covered with foil (1)		
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(Total for Question 7 = 5 marks)

Question Number	Answer	Mark
8(a)	C (organ tissue cell organelle) <i>A is incorrect because the order is incorrect</i> <i>B is incorrect because the order is incorrect</i> <i>D is incorrect because the order is incorrect</i>	1

Question Number	Answer	Additional guidance	Mark
8(b)(i)	specialized / specialised / specialisation (1)	Accept phonetic spelling Ignore specific/ special	1

Question Number	Answer	Additional guidance	Mark
8(b)(ii)	An explanation that makes reference to two from the following - so that different types of cells can each perform specific function(s) / job / task / gives cells a function / eq (1) - so all body processes can occur / division of labour (in multicellular organisms) / eq (so that they) can form tissues / organs / so they can replace dead cells / so they can repair tissues /organs / eq (1)	Ignore refs to medical treatment unqualified	2

Question Number	Answer	Additional guidance	Mark
8(c)	A discussion that makes reference to any six of the following <i>General</i> 1. both can (divide / specialise) so can be used to repair tissues/ repair organs/replace damaged cells 2. can be used to test new drugs/develop <u>new</u> treatments / for medical research / eq (1) 3. adult stem cells may be painful to extract / embryonic usually from spare (IVF) embryos (and parents gave permission) /one example of where adult SC found (e.g. bone marrow/gut/teeth/skin) (1) <i>Cancer</i> 4. both may increase risk of cancer /tumours / as may not stop dividing(1) <i>Potency</i> 5. Greater for embryonic / embryonic totipotent /embryonic can produce any sort of/all types of cells OR adult can only produce one type / produces fewer types / need to be reprogrammed to produce many types / eq (1) 6. so embryonic can be used to treat more diseases (1) <i>Ethical</i> 7. problems /objections with using embryos /not with using adult stem cells (1)	ORA throughout Ignore Repair cells Ignore Uncontrolled growth	6

	8. problems with unregulated clinics (1) <i>Rejection</i> 9. greater risk with using embryonic/no or less risk with adult stem cells (1) <i>Lab culturing</i> 10. embryo cells easier / adult cells more difficult (1) 11. could be contaminated with virus / pathogen / eq (1) <i>Examples</i> 12. up to two examples from heart failure/osteoarthritis/damaged ligaments or tendons / damaged lungs/loss of skin/muscle damage / leukaemia / nerve damage /brain damage / named condition such as Parkinson, spinal cord injuries / diabetes (2)		
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Question Number	Answer	Mark
9(a)(i)	C (7) <i>A is incorrect as bile is not made in number 5</i> <i>B is incorrect because bile is not made in number 6</i> <i>D is incorrect because bile is stored in, but not made in number 8</i>	1

Question Number	Answer	Mark
9(a)(ii)	A (1 and 6) <i>B is incorrect as enzymes are not made in number 2</i> <i>C is incorrect because amylase is not made in 3 and 4</i> <i>D is incorrect because amylase is not made in 4 and 5</i>	1

Question Number	Answer	Additional guidance	Mark
9(a)(iii)	• add Benedict's (reagent) and heat (1) • colour change (blue) to red (1)	Accept clinistix (turns brown) Accept Fehling's A and B plus heat (turns red)	2

Question Number	Answer		Mark
9(b)	Proteins to amino acid(s)	Accept proteins to (di or tri) peptides / shorter/smaller polypeptides Ignore chemical digestion / protein digestion	1

Question Number	Answer	Additional guidance	Mark
9(c)(i)	pH	Accept PH, ph/ acidity/alkalinity Accept (the different) buffers	1

Question Number	Answer	Additional guidance	Mark
9(c)(ii)	0.015 = 3 marks 65 = 1 mark $1 \div 65 = 2$ marks 0.01538 / 0.0154 = 2 marks	Correct response with or without working equals three marks ECF to max 2 for using incorrect graph reading but correct evaluation of $1/x$ to 3 dp 1 mark if incorrectly rounded or not to 3dp	3

Question Number	Answer	Additional guidance	Mark
9 (c)(iii)	An explanation that makes reference to any four from: 1. rate of reaction fastest at pH 8 / enzyme works fastest at pH 8 / slower rate of reaction at pH values above and below 8 / eq (1) 2. (because) takes least time to catalyse/complete the reaction /eq (1)	ORA throughout Accept enzyme most active	4

	3. (because shape of) active site is complementary to (shape of) substrate molecule /eq / active site distorted at pH above/below 8 (1) 4. (so more) enzyme-substrate complexes form (and reaction is catalysed) / E and S can combine / eq (1) 5. albumen molecules are hydrolysed / broken down /digested to amino acids /eq (1)	ignore active site /enzyme denatured ignore refs to KE/ more collisions	
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Question Number	Answer	Additional guidance	Mark
9(d)	An explanation that makes reference to two of the following: • (enzymes are) specific (for substrates) / (each enzyme has) specificity • because lipid molecules have different shape to protein molecules (1) • shape of / 3D structure of, active site (of protease), is complementary to / fits / matches, protein molecules / not lipid molecules (1)	Reject the idea that active site and substrate molecules have the same shape Reject idea that active site is on the substrate molecule	2

(Total for Question 9 = 15 marks)