



Mark Scheme (Results)

Summer 2026

Pearson Edexcel International GCSE in Biology

4BI1/2BR

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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)	An answer that includes: <ul style="list-style-type: none"> production of chlorophyll / chloroplasts / eq (1) 	1

Question Number	Answer	Additional guidance	Mark
1(b)	An explanation that includes two of the following: <ul style="list-style-type: none"> nitrogen gas is unreactive / inert / eq (1) nitrates are in solution / dissolve / eq (1) nitrates can be absorbed / taken in / assimilated /eq (1) 	allow converse nitrates can react N ₂ not in solution / (relatively) insoluble N ₂ cannot be absorbed / taken in	2

Question Number	Answer	Mark
1(c)	An explanation that includes two of the following: <ul style="list-style-type: none"> enzymes are affected by pH / denatured / have optimum pH/ eq (1) changes shape of active site / eq (1) enzyme can no longer bind with substrate /eq (1) 	2

Question Number	Answer	Mark
1(d)	A description that includes three of the following: <ol style="list-style-type: none"> use same size / species / type / age of plant / eq (1) one complete solution without iron and one with complete solution / eq (1) same / control light / carbon dioxide / time / temperature / eq (1) (stated measurement) height / number of leaves / leaf size / leaf colour / mass /eq (1) repeat /eq (1) 	3

Question Number	Answer	Additional guidance	Mark
1(e)	<p>An explanation that includes three of the following:</p> <ul style="list-style-type: none"> • (more oxygen so) more respiration / eq (1) • (more) active transport / eq (1) • (more absorption of) nitrates / eq (1) • used for amino acids / eq (1) • proteins / eq (1) 	allow converse for hydroponic	3
Question Number	Answer	Additional guidance	Mark
1(f)(i)	<p>calculation steps not marking points</p> <p>30% less than hydroponics</p> <p>$(14.2 \div 100) \times 70$</p> <p>= 9.9 or 9.94 (2)</p>	<p>allow one for</p> <p>100-30 or 70 or 0.7 or 70/100 or 0.3 x 14.2 or 30/100 x 14.2</p>	2

Question Number	Answer	Additional guidance	Mark
1(f)(ii)	<p>An explanation that includes three of the following:</p> <ul style="list-style-type: none"> • less water in mist than in solution / plants surrounded by mist / eq (1) • more water vapour / humidity in air /eq (1) • lower concentration gradient / lower water potential gradient / eq (1) • less diffusion / transpiration / evaporation (from plant) eq (1) 	allow converse for hydroponic	3

Question Number	Answer	Additional guidance	Mark
1(g)	<p>An answer that includes:</p> <ul style="list-style-type: none"> • only certain crops make a profit / for high value crops / high demand crops / eq (1) 	<p>allow other crops don't sell for enough</p> <p>not just system is expensive to set up</p>	1

Question Number	Answer	Mark
1(h)	<ul style="list-style-type: none">• can grow more in same space / many plants in same space / uses less space / small(er) area / less land / easier to harvest / eq (1)	1

(Total 18 marks)

Question Number	Answer	Additional guidance	Mark
2(a)	<p>An explanation that includes four of the following:</p> <p>wholemeal bread contains:</p> <ol style="list-style-type: none"> 1. less energy / fewer kJ / eq (1) 2. less weight gain / less obesity / less energy stored as fat/ eq (1) 3. more protein / eq (1) 4. growth and repair / eq (1) 5. more fat / eq (1) 6. stored energy / insulation / eq (1) 7. less starch / less carbohydrates / eq (1) 8. less weight gain / less obesity / less risk of diabetes /eq (1) 	<p>credit only two advantages</p> <p>Only award explanation if advantage is present</p> <p>allow converse for white bread</p> <p>ignore become fat</p> <p>less (risk of) high blood glucose</p>	4

Question Number	Answer	Additional guidance	Mark
2(b)(i)	<p>calculation steps not marking points</p> <p>fibre in 6 slices of white bread = $6 \times (38 \div 100) \times 2.5$ = 5.7</p> <p>fibre in 4 slices of wholemeal bread = $4 \times (38 \div 100) \times 6.7$ = 10.184</p> <p>% change $((10.184 - 5.7) \div 5.7) \times 100$ = 79 (2)</p>	<p>one mark for 5.7 and 10.184</p> <p>allow for 2 marks 78.7 / 76.67 etc and 78.6 recurring</p>	2

Question Number	Answer	Additional guidance	Mark
2(b)(ii)	<p>An answer that includes:</p> <ul style="list-style-type: none"> • aids peristalsis/ egestion / prevents constipation / reduces risk of bowel cancer / eq (1) 	ignore digestion	1

Question Number	Answer	Additional guidance	Mark
2(c)(i)	calculation steps not marking points $50 \times 4.2 \times 11 =$ 2310 J (2)	one mark for $\times 50$ or $\times 11$	2

Question Number	Answer	Additional guidance	Mark
2(c)(ii)	calculation steps not marking points $2310\text{J} = 2.31\text{kJ}$ for 2 g for 1g = $2.31 \times 0.5 = 1.155 \text{ kJ}$ 100g contains $1.155 \times 100 =$ 115.5kJ (2)	allow TE from 2ci allow 2 marks for answer from 2ci $\div 20$ allow 2 marks for 100 or 120 or 116 (sig figs are 1) allow 1 mark for $\times 50$ or $\div 1000$ or $\times 0.05$ or $\div 20$	2

Question Number	Answer	Mark
2(c)(iii)	An explanation that includes three of the following: <ol style="list-style-type: none"> 1. not completely burned / not in oxygen / some energy left in bread / eq (1) 2. energy / heat lost to / absorbed by surroundings / air / during transfer /eq (1) 3. energy lost as light / eq (1) 4. energy lost as bread goes out / during relighting / eq (1) 5. energy / heat lost from boiling tube / heat lost from boiling tube as no lid / heat lost as tube not insulated / used to heat boiling tube (glass) / eq (1) 	3

(Total 14 marks)

Question Number	Answer	Mark
3(a)(i)	<p>D (T)</p> <p><i>A is not correct as P is a nucleus</i></p> <p><i>B is not correct as Q are chloroplasts</i></p> <p><i>C is not correct as R is a vacuole</i></p>	1

Question Number	Answer	Mark
3(a)(ii)	<p>C (R)</p> <p><i>A is not correct as P is a nucleus</i></p> <p><i>B is not correct as Q are chloroplasts</i></p> <p><i>D is not correct as T is a cell wall</i></p>	1

Question Number	Answer	Mark
3(a)(iii)	<p>A (Q)</p> <p><i>B is not correct as R is the vacuole</i></p> <p><i>C is not correct as S is the cytoplasm</i></p> <p><i>D is not correct as T is the cell wall</i></p>	1

Question Number	Answer	Mark
3(b)	<p>An explanation that includes four of the following:</p> <p>bright sunlight</p> <ul style="list-style-type: none"> • open / wider / eq (1) • guard cells turgid /eq (1) • to allow carbon dioxide in / for photosynthesis /eq (1) <p>darkness</p> <ul style="list-style-type: none"> • closed / narrower / eq (1) • guard cells flaccid /eq (1) • prevent water loss / no need to absorb carbon dioxide / no photosynthesis / eq (1) 	4

Question Number	Answer	Additional guidance	Mark
3(c)	<p>A description that includes three of the following:</p> <ul style="list-style-type: none"> • use same size / species / type of plant / leaves of same plant / eq (1) • one with bright light and one with low light / range of light intensities / light and dark / eq (1) • use hydrogen-carbonate indicator / eq (1) • orange / yellow with high carbon dioxide / more released / eq (1) • purple / red / magenta with low carbon dioxide / more absorbed / eq (1) 	not just change light intensity must state how	3

(Total 10 marks)

Question Number	Answer	Additional guidance	Mark
4(a)(i)	<p>An explanation that includes four of the following:</p> <ul style="list-style-type: none"> • moisture / water / eq (1) • hydrolysis / digest / break down / mobilise enzymes / activate enzymes /chemical reactions/ eq (1) • oxygen / eq (1) • respiration /eq (1) • warmth / suitable /optimum temperature / eq (1) • for increased <u>enzyme</u> action / is <u>enzymes</u> (optimum)/ eq (1) 	<p>only credit two conditions</p> <p>one mark for condition one for explanation /reason</p> <p>no credit for explanation without condition</p>	4

Question Number	Answer	Additional guidance	Mark
4(a)(ii)	<p>An explanation that includes two of the following:</p> <ul style="list-style-type: none"> • stored food / stored carbohydrates / fats / /energy store /eq (1) • digested by enzymes / eq (1) • used in respiration / release energy /eq (1) • allow grows upwards / negatively gravitropic / eq (1) 	ignore glucose	2

Question Number	Answer	Additional guidance	Mark
4(b)	<p>A description that includes three of the following:</p> <ul style="list-style-type: none"> • mitosis (1) • runners / eq (1) • break off / form new plant / separate organism / eq (1) • clone / <u>genetically</u> identical / identical DNA /eq (1) 	<p>ignore cuttings micropropagation etc</p> <p>corms / bulbs / rhizomes / tubers</p>	3

(Total 9 marks)

Question Number	Answer	Additional guidance	Mark
5(a)	<p>An answer that includes five of the following:</p> <ol style="list-style-type: none"> 1. algae grown more in farming as easy to cultivate / grow / farm / eq (1) 2. algae grown more in farming as used for food source / producer / carry out photosynthesis / start of food chain /eq (1) 3. molluscs /oysters / mussels / clams more grown in farming as easy to control or grow / filter feed/ clean water/ less predation / eq (1) 4. molluscs /oysters / mussels / clams more grown in farming as easy to harvest / move little / grow on rock / grow on rope / eq (1) 5. crustacea / crabs / prawns / shrimp mainly farmed as easy to harvest / fast growing / can live in high density / eq (1) 6. saltwater finfish / mackerel / tuna/ cod most fished as (still) easy to catch / abundant / high population /eq (1) 7. saltwater finfish mackerel / tuna / cod few farmed / farming not worked / as live in the sea / travel about more / need more space / hard to keep in non-flowing water / waste builds up / eq (1) 8. freshwater finfish / <i>Tilapia</i> / perch / trout most farmed / as can live in ponds / live 	<p>comment on mass grown and reason / explanation for each mark</p> <p>if no reason allow max one mark for any correct statement about more or less farmed</p> <p>allow converse</p> <p>allow freshwater crustacea all farmed as...</p>	5

	in rivers / keep in ponds / still water / shallow water / nets / eq (1)		
	9. data for one year only / not repeated / eq (1)		

Question Number	Answer	Additional guidance	Mark
5(b)	<p>An explanation that includes four of the following:</p> <ol style="list-style-type: none"> 1. pesticide / fungicide / vaccinate / antibiotics /eq (1) 2. kills pathogen / prevents disease /eq (1) 3. separate / remove diseased fish /eq (1) 4. prevents disease / infection spread / eq (1) 5. selectively breeding fish / use Genetic Modification /GM / use Genetic engineering / eq (1) 6. bred for high growth rate / disease resistance / lack of aggression / eq (1) 7. reduce stock density / separate species / sizes / use nets / eq (1) 8. prevent inter and intra specific predation / competition / eq (1) 9. feed small amounts of (high protein) food regularly / eq (1) 10. prevent algal growth / eutrophication / prevent decomposition / bacteria / oxygen depletion / eq (1) 11.remove excess food / waste / faeces / eq(1) 12.prevent algal growth / eutrophication /prevent decomposition / bacteria / oxygen depletion / eq (1) 	<p>only credit two methods</p> <p>one for method one for matching explanation</p> <p>no credit for explanation alone</p>	4

Question Number	Answer	Additional guidance	Mark
5(c)	<p>An answer that includes:</p> <ul style="list-style-type: none"> • more profits / less risk to life / reduction in wild fish / harder to catch wild fish / overfishing (of wild fish) / increased demand / increased human population / eq (1) 		1

(Total = 10 marks)

Question Number	Answer	Mark
6(a)(i)	nitrogen cycle / N cycle (1)	1

Question Number	Answer	Mark
6(a)(ii)	<p>A = denitrification / denitrifying / eq (1)</p> <p>B = nitrification / nitrifying / eq (1)</p>	2

Question Number	Answer	Mark
6(b)(i)	<p>An explanation that includes two of the following:</p> <ul style="list-style-type: none"> • reduces oxygen (1) • less carbon dioxide removed / increases carbon dioxide / eq (1) • as fewer trees / eq (1) • less photosynthesis / eq (1) 	2

Question Number	Answer	Mark
6(b)(ii)	<p>A description that includes four of the following:</p> <ol style="list-style-type: none"> 1. less transpiration (1) 2. less water in the atmosphere / eq (1) 3. less clouds / less rainfall / eq (1) 4. soil erosion / soil washed away / eq (1) 5. soil becomes infertile / lacks minerals / leaching of minerals / eq (1) 6. flooding / eq (1) 	4

(Total = 9 marks)