



Mark Scheme (Results)

Summer 2025

Pearson Edexcel GCSE
In Biology (1BI0)
Paper 2F

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General Marking Guidance

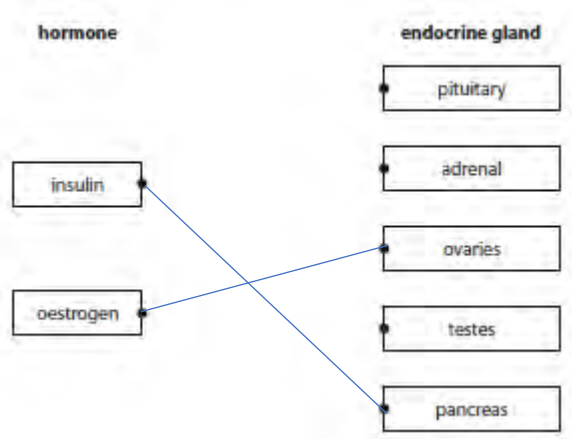
- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should 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.

Mark schemes have been developed so that the rubrics of each mark scheme reflects the characteristics of the skills within the AO being targeted and the requirements of the command word. So for example the command word 'Explain' requires an identification of a point and then reasoning/justification of the point. Explain questions can be asked across all AOs. The distinction comes whether the identification is via a judgment made to reach a conclusion, or, making a point through application of knowledge to reason/justify the point made through application of understanding. It is the combination and linkage of the marking points that is needed to gain full marks.

When marking questions with a 'describe' or 'explain' command word, the detailed marking guidance below should be consulted to ensure consistency of marking.

Assessment Objective		Command Word	
Strand	Element	Describe	Explain
AO1		An answer that combines the marking points to provide a logical description	An explanation that links identification of a point with reasoning/justification(s) as required
AO2		An answer that combines the marking points to provide a logical description, showing application of knowledge and understanding	An explanation that links identification of a point (by applying knowledge) with reasoning/justification (application of understanding)
AO3	1a and 1b	An answer that combines points of interpretation/evaluation to provide a logical description	
AO3	2a and 2b		An explanation that combines identification via a judgment to reach a conclusion via justification/reasoning
AO3	3a	An answer that combines the marking points to provide a logical description of the plan/method/experiment	
AO3	3b		An explanation that combines identifying an improvement of the experimental procedure with a linked justification/reasoning

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Question number	Answer	Mark
1(a)	 Do not award mark if two lines are drawn from either hormone box.	(2)

Question number	Answer	Additional guidance	Mark
1(b)(i)	7.6 (mmol per dm ³)	accept a range of 7.2 - 8.0	(1)

Question number	Answer	Additional guidance	Mark
1(b)(ii)	A description including two from: • decreases (1) • and then increases (1)		(2)

Question number	Answer	Additional guidance	Mark
1(c)	A description including two from: • control diet (1) • exercise (1) • take medication (1)	accept eat fewer carbohydrates / sugars / glucose / eat a low fat diet ignore healthy diet / balanced diet / go on a diet accept lose weight against MP1 or MP2 accept use metformin accept use insulin accept take named medication	(2)

Total for Question 1 = 7 marks

Question number	Answer	Mark
2(a)	(water) + carbon dioxide (1) $\longrightarrow$ (glucose) + oxygen (1)	(2)

Question number	Answer	Additional guidance	Mark
2(b)(i)	light doesn't (usually) reach the roots / photosynthesis needs light / root cells do not have chloroplasts (1)		(1)

Question number	Answer	Mark
2(b)(ii)	The only correct answer is B sucrose A is incorrect because starch is not transported in the phloem C is incorrect because urea is not transported in the phloem D is incorrect because plasma is not transported in the phloem	(1)

Question number	Answer	Additional guidance	Mark
2(c)	A description linking two from: • found in chloroplasts (1) • which absorbs light (1) • for photosynthesis (1)		(2)

Question number	Answer	Additional guidance	Mark
2(d)	Two from: (the oil burning heater) • produces carbon dioxide (1) • increases temperature (1) • produces water (vapour) (1)	accept increases humidity accept produces light (1)	(2)

Total for Question 2 = 8 marks

Question number	Answer	Mark
3(a)(i)	An explanation including two from: • (muscle) contracts (1) • raising hair (1) • which traps air (1) • which insulates the skin / reduces heat loss (1)	(2)

Question number	Answer	Additional guidance	Mark
3(a)(ii)	An explanation linking two from: • (sweat) spreads over skin (1) • taking heat from the {skin / body} (1) • which then evaporates (1)	accept released onto skin / sweat is on the skin	(2)

Question number	Answer	Mark
3(b)	The only correct answer is D repeat the investigation on 20 different women A is incorrect because testing a man would not give information about women. B is incorrect because the body temperature is not what is being tested C is incorrect because reducing the temperature of the air further is not testing when the adult starts to shiver	(1)

Question number	Answer	Additional guidance	Mark
3(c)(i)	37 ($^{\circ}\text{C}$) (1)	accept any temperature in the range of 36°C to 38°C	(1)

Question number	Answer	Additional guidance	Mark
3(c)(ii)	Any two from: - concentration gradient (1) - diffusion distance (1) - surface area (1)	accept differences in concentration accept surface area: volume ratio accept size of particle (1)	(2)

Total for Question 3 = 8 marks

Question number	Answer	Mark
4(a)	- proteins (1) - decomposers (1) Answers must be in the correct order	(2)

Question number	Answer	Additional guidance	Mark
4(b)(i)	Substitution: $180 \div 100 \times 55$ (1) Evaluation: 99 (million tonnes)	award full marks for the correct answer with no working accept other ways of working	(2)

Question number	Answer	Additional guidance	Mark
4(b)(ii)	eutrophication		(1)

Question number	Answer	Additional guidance	Mark
4(c)(i)	both columns plotted algae L = 10 (1) algae M = 6 (1)	tolerance = $\frac{1}{2}$ small square	(2)

Question number	Answer	Mark
4(c)(iii)	The only correct answer is: C plants die as they do not receive enough light A is incorrect because a build-up of algae on the surface of the lake does not make the plants growing at the bottom of the lake warmer. B is incorrect because there is less light getting to the plants on the bottom of the lake so these plants photosynthesise less D is incorrect because the algae have no effect on the plants ability to absorb water	(1)

Total for Question 4 = 10 marks

Question number	Answer		Mark
5(a)(i)	A diagram showing: - the basic shape of both guard cells (1) (basic shape of) stoma clearly seen (1)		(2)

Question number	Answer	Mark
5(a)(ii)	guard cell(s)	(1)

Question number	Answer	Mark
5(b)(i)	auxin	(1)

Question number	Answer	Mark
5(b)(ii)	phototropism accept phonetic spellings	(1)

Question number	Answer	Additional guidance	Mark
5(c)(i)	an answer linking: - Plant A has fewer root hair cells (per mm²) (1) - Plant A has shorter root hair cells (1)	ORA	(2)

Question number	Answer	Mark
5(c)(ii)	Any two from: plant B / plant in the dry soil has • a thicker cuticle (1) • fewer stomata (1) • more layers / two layers of cells in the upper epidermis (1) • smaller air spaces / more cells in spongy layer (1) • more layers / two layers of cells in the lower epidermis (1)	(2)

Total for Question 5 = 9 marks

Question number	Answer	Additional guidance	Mark
6(a)(i)	measurements: (T-U =) 5 mm (1)	allow a thickness from 4 to 6mm	(1)

Question number	Answer	Additional guidance	Mark
6(a)(ii)	A description including two from: • (right) ventricle / heart contracts (1) • (blood leaves through the) pulmonary artery (1) • to the lungs (1) • absorbs oxygen (by diffusion) (1)	accept pushes / pumps for contracts	(2)

Question number	Answer	Mark
6(a)(iii)	The only correct answer is D vena cava A is incorrect because the aorta does not carry deoxygenated blood B is incorrect because pulmonary artery carries blood away from the heart C is incorrect because the pulmonary vein does not carry deoxygenated blood	(1)

Question number	Answer	Additional guidance	Mark
6(b)	two / 2		(1)

Question number	Answer	Additional guidance	Mark
6(c)	A description including three from: • blood is put under pressure (1) • (blood flows) through the valve (1) • into the aorta (1) • to the body (1)	accept blood is pumped / pushed	(3)

Question number	Answer	Mark
6(d)(i)	vein	(1)

Question number	Answer	Additional guidance	Mark
6(d)(ii)	A description including 2 from: • large surface area (to volume ratio) (1) • (very) thin wall (1) • has {gaps / holes} in (wall) / it is permeable (1) • (the structure) increases the rate of diffusion / causes faster diffusion / shorter diffusion pathway (1)	accept (wall) is one cell thick accept it is leaky accept shorter diffusion distance	(2)

Total for Question 6 = 11 marks

Question number	Answer	Mark
7(a)	The only correct answer is B liver A, C and D are incorrect because urea is made in the liver	(1)

Question number	Answer	Mark
7(b)	amino acids / proteins / ammonia	(1)

Question number	Answer	Additional guidance	Mark
7(c)(i)	A description including: (3rd box) diffusion (1) (4th box) blood (1)	accept patient / vein	(2)

Question number	Answer	Additional guidance	Mark
7(c)(ii)	An answer including two from: - risks of surgery (1) - rejection (of kidney) (1) - lifelong medication (1) - difficult to find a donor (1)	accept risk of infection accept references to donated kidney needing replacing over time accept anti-rejection drugs / immunosuppressants accept take named medications accept risks for the donor (1)	(2)

Question number	Indicative content	Mark
7(d) *	Part W Kidney: - removes urea / other named substances from blood (ultra) filtration - reabsorbs useful molecules e.g. glucose - reabsorbs water - produces urine Part X Ureter: - takes urine to bladder Part Y Bladder: - stores urine - pushes urine out of body Part Z Urethra: - takes urine out of body	(6)

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1-2	- Demonstrates elements of biological understanding, some of which is inaccurate. Understanding of scientific, enquiry, techniques and procedures lacks detail. (AO1) - Presents a description which is not logically ordered and with significant gaps. (AO1)
Level 2	3-4	- Demonstrates biological understanding, which is mostly relevant but may include some inaccuracies. Understanding of scientific ideas, enquiry, techniques and procedures is not fully detailed and/or developed. (AO1) - Presents a description of the procedure that has a structure which is mostly clear, coherent and logical with minor steps missing. (AO1)
Level 3	5-6	- Demonstrates accurate and relevant biological understanding throughout. Understanding of the scientific ideas, enquiry, techniques and procedures is detailed and fully developed. (AO1) - Presents a description that has a well-developed structure which is clear, coherent and logical. (AO1)

Level	Mark	Additional guidance	General additional guidance Description of parts is the level driver. The detail / names used determines the mark within the level.
	0	No rewardable material.	
Level 1	1–2	- describes a role of one part linked to a correct letter or name - names at least one part	<u>Possible candidate responses:</u> - Z releases urine - The urethra releases urine
Level 2	3–4	- describes a role of more than one part linked to a correct letter or name - names more than one part	<u>Possible candidate responses:</u> - W filters urea and water to make urine. Y stores the urine - The kidney filters urea and water to make urine. The bladder is where urine is stored.
Level 3	5–6	- describes a role of at least three parts linked to a correct letter or name - names at least three parts	<u>Possible candidate responses:</u> - W is where small molecules including urea are filtered out of the blood. X is where urine moves from the kidney to be stored in Y - The kidney is where small molecules including urea are filtered out of the blood. The ureter is where urine moves from the kidney to be stored in the bladder

Total for Question 7 = 12 marks

Question number	Answer	Additional guidance	Mark
8(a)	An explanation linking two from: - blood pumped faster (around the body) (1) - because more {oxygen / glucose} is needed (by the muscles) (1) - because more {respiration / energy is needed} (when running) (1)	accept remove more carbon dioxide more only has to be written once for more oxygen / more glucose / more respiration	(2)

Question number	Answer	Additional guidance	Mark
8(b)	A description including: (pathogens) get stuck in mucus (1) cilia {move / waft} the {pathogens / mucus} (1) - to the throat / up the {trachea / bronchiole} / to be swallowed (1)	accept micro-organisms for pathogens accept hairs for cilia	(2)

Question number	Answer	Additional guidance	Mark
8(c)	An explanation linking two from: - glucose and oxygen (1) (to form) carbon dioxide and water (1) - in an exothermic reaction (1) - which takes place in the mitochondria (1)	accept $C_6H_{12}O_6 + O_2$ accept $CO_2 + H_2O$ accept correct equation for aerobic respiration for 2 marks	(2)

Question number	Answer	Additional guidance	Mark
8(d) (i)	to absorb the carbon dioxide	accept CO_2	(1)

Question number	Answer	Additional guidance	Mark
8(d) (ii)			(1)

Question number	Answer	Additional guidance	Mark
8(d)(iii)	An explanation linking two from: • (the drop) would move more slowly / shorter distance (1) • as less oxygen would be used • so less respiration would occur (1)	accept less carbon dioxide {produced / absorbed}	(2)

Question number	Answer	Mark
8(d)(iv)	repeat the investigation / calculate a mean	(1)

Total for Question 8 = 11 marks

Question number	Answer	Mark
9(a)(i)	native (species) / (species) from the country of origin	(1)

Question number	Answer	Additional guidance	Mark
9(a)(ii)	quadrat / stated size of square area	accept {belt / line} transect / a grid	(1)

Question number	Answer	Mark
9(b)(i)	increases / goes up / rises	(1)

Question number	Answer	Additional guidance	Mark
9(b)(ii)	The only correct answer is B species C A is incorrect because Species A is decreasing so will not out-compete C is incorrect because species D has only increased by 2 so will not out-compete B D is incorrect because species H is not present so will not out-compete species B		(1)

Question number	Answer	Additional guidance	Mark
9(b)(iii)	An explanation linking: - taller / bigger / had larger leaves / had larger roots (1) (got more) water / minerals / nutrients / light / photosynthesis (1)	ORA accept grows / reproduces / takes up more space / higher population accept named minerals accept disease / eaten by animals (1)	(2)

Question number	Answer	Mark
9(b)(iv)	(seeds) blown in by the wind / (seeds) brought in by animals / {roots / shoots} growing under the wall	(1)

Question number	Indicative content	Mark
9(c)*	AO2 / AO3 Plan - use a quadrat / description of quadrat - place on ground - randomly - identify plants in quadrat - count the number of each of the types of plants found in each 'quadrat' Calculation - method of scaling up to size of field - calculate a mean (per quadrat / for each species) - multiply mean by area of field / number per m² by 1000 Details - size of quadrat - how to place quadrat randomly - when to count plant as present e.g. more than half in quadrat - repeats (places a quadrat more than once) - multiply by 4 to get number per square metre if a ½ m / ¼ m² quadrat used - don't put quadrat in an area already used	(6)

Level	Mark	Descriptor
	0	No awardable content
Level 1	1–2	- The plan attempts to link and apply knowledge and understanding of scientific enquiry, techniques and procedures, flawed or simplistic connections made between elements in the context of the question. (AO2) - Analyses the scientific information but understanding and connections are flawed. An incomplete plan that provides limited synthesis of understanding. (AO3)
Level 2	3–4	- The plan is mostly supported through linkage and application of knowledge and understanding of scientific enquiry, techniques and procedures, some logical connections made between elements in the context of the question. (AO2) - Analyses the scientific information and provides some logical connections between scientific enquiry, techniques and procedures. A partially completed plan that synthesises mostly relevant understanding, but not entirely coherently. (AO3)
Level 3	5–6	- The plan is supported throughout by linkage and application of knowledge and understanding of scientific enquiry, techniques and procedures, logical connections made between elements in the context of the question. (AO2) - Analyses the scientific information and provide logical connections between scientific concepts throughout. A well-developed plan that synthesises relevant understanding coherently. (AO3)

Level	Mark	Additional guidance	General additional guidance The level is driven by the plan. The mark within the level is determined by the calculation
	0	No rewardable material.	
Level 1	1–2	States a relevant part of a plan States relevant parts of a plan or one part of a plan with some detail	<u>Possible candidate responses</u> - Count the plants in the field / part of the field - Count the plants in the field / part of the field. Place a grid on the ground and count the plants inside.
Level 2	3–4	States aspects of a plan with some detail Includes how to calculate the number of each species in the field but omits detail	<u>Possible candidate responses</u> - Put a $\frac{1}{2}$ metre square on the ground and count how many of each plant are in the square - Put a $\frac{1}{2}$ metre square on the ground and count how many of each type of plant are in the square. Multiply the number of each plant by the size of the field.
Level 3	5–6	Produces a workable, detailed plan that includes placing quadrats randomly and counting the number of each species within the quadrat Calculates the number of (each species of) plant in the field e.g. multiplying the average number of each species in the quadrats / per m^2 by the area of the field	<u>Possible candidate responses</u> - Place quadrats randomly 3 times (by using random coordinates). Count the plants of each species that are inside the quadrat. - Place quadrats randomly 3 times (by using random coordinates). Count the plants of each species that are inside the quadrat. Calculate the average for each species per quadrat / m^2. Multiply the averages per quadrat by 4 and then by the area of the field / by 1000.

Total for Question 9 = 13 marks

Question number	Answer	Additional guidance	Mark
10(a)	Measurement 15 mm (1) Substitution $15 \div 18\,000 = 0.00083$ (1) Standard form 8.3×10^{-4}	accept correct answer for full marks with no working. accept 14 mm – 16 mm accept reading in cm accept 0.00078 / 0.00086 / 0.00089 accept 8.9×10^{-4} 8.6×10^{-4} 7.8×10^{-4}	(3)

Question number	Answer	Mark
10(b)(i)	5 / 5.0 / 5.1 / 5.2 / 5.3 / 5.4	(1)

Question number	Answer	Mark
10(b)(ii)	A description including - from pH 5 to pH 7 the growth of the bacterium increased (1) - pH 7 is optimum (1) - from pH 7 to pH 8.5 the growth of the bacteria decreased (1)	(2)

Question number	Answer	Mark
10(c)(i)	The only correct answer is D volume of the milk A is incorrect as pH is a dependent variable B is incorrect as temperature is an independent variable C is incorrect as incubation time is set by the student	(1)

Question number	Answer	Additional guidance	Mark
10(c)(ii)	An answer including: - pH decreases (1) (from 6.6) to 4.8 / by 1.8 (1)	accept becomes more acidic	(2)

Question number	Answer	Additional guidance	Mark
10(c)(iii)	Substitution Change in pH = 1.4 (1) Evaluation: answer divided by 72 0.019	award full marks for correct answer with no working accept 0.0194 / 0.02	(2)

Total for Question 10 = 11 marks

