



National
Qualifications
2026

2026 Biology

National 5

Question Paper Finalised Marking Instructions

These marking instructions have been prepared by examination teams for use by Qualifications Scotland appointed markers when marking external course assessments.

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General Marking Principles for National 5 Biology

This information is provided to help you understand the general principles you must apply when marking candidate responses to questions in this paper. These principles must be read in conjunction with the marking instructions, which identify the key features required in candidate responses.

- (a) Marks for each candidate response must **always** be assigned in line with these general marking principles and the detailed marking instructions for this assessment.
- (b) Marking should always be positive. This means that, for each candidate response, marks are accumulated for the demonstration of relevant skills, knowledge and understanding; they are not deducted from a maximum on the basis of errors or omissions.
- (c) If a specific candidate response does not seem to be covered by either the principles or detailed marking instructions, and you are uncertain how to assess it, you must seek guidance from your team leader.
- (d) There are no half marks awarded.
- (e) Where a candidate makes an error at an early stage in the first part of a question, credit should normally be given for subsequent answers that are correct with regard to this original error. Candidates should not be penalised more than once for the same error.
- (f) Unless a numerical question specifically requires evidence of working to be shown, full marks should be awarded for a correct final answer (including units, if appropriate) on its own.
- (g) In the detailed marking instructions, if a word is underlined then it is essential; if a word is (bracketed) then it is not essential.
- (h) In the detailed marking instructions, words separated by / are alternatives.
- (i) A correct answer can be negated if:
 - an extra, incorrect, response is given
 - additional information that contradicts the correct response is included.
- (j) Unless otherwise required by the question, use of abbreviations (e.g. DNA, ATP) or chemical formulae (e.g. CO₂, H₂O) are acceptable alternatives to naming.
- (k) Where incorrect spelling is given:
 - If the correct word is recognisable then give the mark;
 - If the word can easily be confused with another biological term then do not give the mark eg mitosis and meiosis;
 - If the word is a mixture of other biological words then do not give the mark, eg osmotis, respirduction, protosynthesis.
- (l) Presentation of data
 - If a candidate provides two graphs or charts, mark both and give the higher score.
 - If a question asks for a particular type of graph and the wrong type is given, then full marks cannot be awarded. Candidates cannot achieve the plot mark but **may** be able to achieve the mark for scale and label.
 - If the x and y data are transposed, then do not give the scale and label mark.
 - If the graph used less than 50% of the axes, then do not give the scale and label mark.
 - If 0 is plotted when no data is given, then do not give the plot mark (ie candidates should only plot the data given).
 - No distinction is made between bar graphs and histograms for marking purposes.
 - In a pie chart lines must originate from the central point and extend to tick marks. Labels must be given in full.

- (m) Marks awarded only for a valid response to the question asked. For example, in response to questions that ask candidates to:
- **identity, name, give or state**, they need only answer or present in brief form;
 - **describe**, they must provide a statement as opposed to simply one word;
 - **explain**, they must provide a reason for the information given;
 - **compare**, they must demonstrate knowledge and understanding of the similarities and/or differences between topics being examined;
 - **calculate**, they must determine a number from given facts, figures or information;
 - **predict**, they must indicate what may happen based on available information;
 - **suggest**, they must apply their knowledge and understanding to a new situation.

Marking instructions for each question

Section 1

Question	Response	Mark
1.	B	1
2.	C	1
3.	A	1
4.	D	1
5.	C	1
6.	D	1
7.	D	1
8.	C	1
9.	B	1
10.	A	1
11.	A	1
12.	B	1
13.	A	1
14.	C	1
15.	D	1
16.	C	1
17.	C	1
18.	D	1
19.	B	1
20.	D	1
21.	B	1
22.	A	1
23.	D	1
24.	B	1
25.	C	1

Section 2

Question			Expected response	Max mark	Additional guidance
1.	(a)		Structure X: Vacuole. (1) Function: supports the cell. OR Storage of/contains water/minerals/(cell) sap. OR Maintaining turgor. (1)	2	Not acceptable: Additional incorrect information negates e.g. maintains structure
	(b)		Plant cells have chloroplasts AND fungal cells don't/ ONLY plant cells have chloroplasts. OR Different cell wall structure. OR Plant cell walls are composed of cellulose AND fungal cells are not.	1	
	(c)		Structure: Ribosome/Cytoplasm. (1) Function: Ribosome - (site of) protein synthesis/makes proteins. Function: Cytoplasm - (site of) chemical/cellular reactions. (1)	2	
2.	(a)	(i)	Yellow	1	
		(ii)	1. iodine diffuses/moves into the model cell (1) 2. starch cannot diffuse/move out of the model cell (1)	2	Response must refer to the molecule and the direction for both.
	(b)		Osmosis	1	
	(c)		Phospholipids OR Proteins	1	Not acceptable: lipids

Question			Expected response	Max mark	Additional guidance
3.	(a)		Double (stranded) helix	1	
	(b)		Guanine	1	Not acceptable: G
	(c)		500	1	
	(d)	(i)	Gene	1	
		(ii)	The sequence/order of amino acids is changed/different.	1	

Question			Expected response	Max mark	Additional guidance
4.	(a)	(i)	Any 2 from: • volume of amylase • concentration of amylase • volume of (pH) solution • volume/mass of starch • concentration of starch (agar) • depth/volume of starch agar • spacing of wells • size of well/diameter of well • depth/volume of wells • volume of iodine • concentration of iodine • size of petri dish	2	Accept amount/mass/weight as an alternative to volume Also acceptable: volume of (pH) buffer Not acceptable: level of amylase/pH solution
		(ii)	To increase the reliability (of results). OR To make the results more reliable.	1	
	(b)	(i)	21	1	
		(ii)	Starch (agar) has been broken down/digested (by amylase).	1	Not acceptable: Starch is not present
		(iii)	As pH increases amylase activity increases up to pH7 and then decreases (as pH increases further).	1	The response must refer to amylase activity and not the diameter of the clear area. Not acceptable: pH 7 is the optimum pH for amylase activity on its own
5.	(a)	(i)	Aerobic (respiration)	1	
		(ii)	Fungal/yeast/plant	1	
		(iii)	Cytoplasm	1	
	(b)		21:1:1	1	
6.	(a)	(i)	Unspecialised	1	Also acceptable: undifferentiated Not acceptable: self-renew alone but does not negate a correct response
		(ii)	Growth/repair (damaged tissues) replace dead/damaged cells	1	
	(b)	(i)	Mitosis/cell division	1	
		(ii)	192	1	
	(c)		Immune (system)	1	

Question			Expected response	Max mark	Additional guidance
7.	(a)		Motor	1	
	(b)	(i)	(Along neuron by) electrical impulses.	1	Not acceptable: electrical signals.
		(ii)	(Transferred to neuron by) chemicals/chemically.	1	Acceptable: chemical messages/neurotransmitters Not acceptable: chemical messengers
	(c)		80	1	
	(d)		Protects (the body) from harm.	1	Acceptable: protects (the body) from danger Not acceptable: prevents harm/damage
8.	(a)		R	1	
	(b)	(i)	In/through the blood(stream).	1	
		(ii)	(From day 0) to day 12 hormone concentration stays the same at 15 (units). (1) (From day 12) to day 14/then hormone concentration increases to 75 (units)/increases by 60 (units). (1)	2	1 mark for: Stays the same for the first twelve days and then increases. OR Stays the same at 15 (units) THEN increases. OR It stays the same THEN increases to 75 (units)/by 60 (units). Additional incorrect information beyond day 14 can only be awarded 1 mark .
		(iii)	5	1	
9.	(a)	(i)	Hh	1	
		(ii)	They (all) have a dominant allele.	1	
	(b)	(i)	A random change to genetic material /genes/base sequence/DNA.	1	
		(ii)	Homozygous	1	

Question			Expected response	Max mark	Additional guidance
10.	(a)		Control	1	Not acceptable: placebo
	(b)		Participants could have forgotten/exaggerated/under-estimated/not told the truth (about recording their own protein intake).	1	Acceptable: accuracy of recording their own daily protein intake
	(c)		67.5	1	
	(d)		Training programme alone/group without supplement still showed an increase in (all three) measurements. OR Training programme alone/group without supplement showed a greater increase in knee strength. OR Lean mass - no significant increase/difference.	1	
11.			- vena cava to right atrium - right atrium to right ventricle - right ventricle to pulmonary artery Any 2 - pulmonary vein to left atrium. - left atrium to left ventricle - left ventricle to aorta Any 2 7. location of valves/ valves prevent the backflow of blood Point 7 must be included for 5 marks.	5	

Question			Expected response	Max mark	Additional guidance
12.	(a)	(i)	Community	1	
		(ii)	Carnivore: Red Fox/Sparrowhawk. (1)	2	
			Omnivore: Pine marten. (1)		
		(iii)	Growth	1	
		(iv)	There are more stages/levels/transfers for energy to be lost.	1	
	(b)		10 (%)	1	
13.	(a)		(To feed) increasing population.	1	
	(b)		Increase (1)	2	
			Bacteria feed on dead plants/algae. (1)		
	(c)		Used by bacteria.	1	Acceptable: less photosynthesis due to reduced light levels Not acceptable: bacteria use up all oxygen
	(d)		Genetically modified/GM crop.	1	Accept: genetically engineered crop Not acceptable: use pesticides

Question			Expected response	Max mark	Additional guidance												
14.	(a)		Light reactions	1	Acceptable: photolysis												
	(b)		Scale and label (1) Points plotted and line drawn (1) <table><tr><th>Temperature (°C)</th><th>Volume of oxygen produced (cm³/ minute)</th></tr><tr><td>10</td><td>1.3</td></tr><tr><td>20</td><td>2.5</td></tr><tr><td>30</td><td>3.8</td></tr><tr><td>50</td><td>0.7</td></tr><tr><td>70</td><td>0.0</td></tr></table>	Temperature (°C)	Volume of oxygen produced (cm ³ / minute)	10	1.3	20	2.5	30	3.8	50	0.7	70	0.0	2	Acceptable: O ₂ as an alternative to oxygen If brackets are missing do not penalise.
Temperature (°C)	Volume of oxygen produced (cm ³ / minute)																
10	1.3																
20	2.5																
30	3.8																
50	0.7																
70	0.0																
	(c)		As temperature increases, rate of photosynthesis increases until 30 (°C) (1) then it decreases. (1)	2	Must show correct causation. 1 mark for correct description of increase and then decrease in rate of photosynthesis (without mention of 30 (°C)). 1 mark for correct trend and 30 (°C) identified, if only referring to volume of oxygen produced.												
	(d)		Enzymes required/involved/control photosynthesis. (1) (At 70 °C/high temperatures) enzymes are denatured. (1)	2	Not acceptable: enzymes are denaturing or a description of denaturing/denatured on its own												
15.	(a)		Adaptation	1	Not acceptable: adapting												
	(b)		(They are the) same species.	1													
	(c)		Natural selection/survival of the fittest.	1													
	(d)		0.3	1													

[END OF MARKING INSTRUCTIONS]