CAMBRIDGE
International Education

Cambridge IGCSE™

BIOLOGY **0610/51**

Paper 5 Practical Test **May/June 2026**

MARK SCHEME

Maximum Mark: 40

Published

This mark scheme contains the instructions and marking guidance that our examiners used to mark candidate responses for this component.

Before they start marking, examiners complete a standardisation process. They review a range of candidate responses and discuss the mark scheme in detail to agree which answers can and cannot be accepted. Examiners award marks where it is clear that candidate responses have met the requirements of the mark scheme. These requirements may vary between different components or different versions of the same component, depending on the exact requirements of the question and the candidate responses seen during the standardisation process.

Sometimes, our mark schemes may allow marks to be awarded to responses which contain elements that are factually incorrect or for content not covered by the syllabus. We do this in response to the demands of a specific question to support candidates and make sure that our assessments are fair. However, these allowances should not be used as a guide for teaching and learning.

We cannot discuss the mark scheme with schools, and we recommend that schools read the mark scheme together with the assessment material and the Principal Examiner Report for Teachers.

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General marking principles

All examiners must apply these marking principles when marking candidate responses.

1	Examiners must award marks for each response in line with: • the specific **content** defined in the mark scheme • the specific **skills** defined in the mark scheme or in the level descriptions • the **standard of response** required as exemplified by the standardisation scripts.
2	Examiners must award **whole marks** (not half marks, or other fractions).
3	Examiners must award marks **positively**. This means that: • marks are not deducted for errors or omissions • marks are awarded for correct/valid answers as defined in the mark scheme and also for **other valid answers** which go beyond the scope of the syllabus and mark scheme referring to your team leader as appropriate • the quality of spelling, punctuation and grammar are judged **only** when the mark scheme indicates that these features are **specifically assessed** in the question. However, the meaning of all responses must be unambiguous.
4	Examiners must **consistently** apply the requirements of the mark scheme and any rules for what to do when candidates have not followed instructions correctly.
5	Examiners must use the **full range of marks** defined in the mark scheme, unless limited by the quality of the candidate responses seen.
6	Examiners must award marks according to the mark scheme and **must not** award marks with grade thresholds or grade descriptions in mind.

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Science-Specific Marking Principles

1	Examiners should consider the context and scientific use of any keywords when awarding marks. Although keywords may be present, marks should not be awarded if the keywords are used incorrectly.
2	The examiner should not choose between contradictory statements given in the same question part, and credit should not be awarded for any correct statement that is contradicted within the same question part. Wrong science that is irrelevant to the question should be ignored.
3	Although spellings do not have to be correct, spellings of syllabus terms must allow for clear and unambiguous separation from other syllabus terms with which they may be confused (e.g. ethane / ethene, glucagon / glycogen, refraction / reflection).
4	The error carried forward (ecf) principle should be applied, where appropriate. If an incorrect answer is subsequently used in a scientifically correct way, the candidate should be awarded these subsequent marking points. Further guidance will be included in the mark scheme where necessary and any exceptions to this general principle will be noted.
5	<u>'List rule' guidance</u> For questions that require ***n*** responses (e.g. State **two** reasons …): • The response should be read as continuous prose, even when numbered answer spaces are provided. • Any response marked *ignore* in the mark scheme should not count towards ***n***. • Incorrect responses should not be awarded credit but will still count towards ***n***. • Read the entire response to check for any responses that contradict those that would otherwise be credited. Credit should **not** be awarded for any responses that are contradicted within the rest of the response. Where two responses contradict one another, this should be treated as a single incorrect response. • Non-contradictory responses after the first ***n*** responses may be ignored even if they include incorrect science.

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6	<u>Calculation specific guidance</u> Correct answers to calculations should be given full credit even if there is no working or incorrect working, **unless** the question states 'show your working'. For questions in which the number of significant figures required is not stated, credit should be awarded for correct answers when rounded by the examiner to the number of significant figures given in the mark scheme. This may not apply to measured values. For answers given in standard form (e.g. $a \times 10^n$) in which the convention of restricting the value of the coefficient (a) to a value between 1 and 10 is not followed, credit may still be awarded if the answer can be converted to the answer given in the mark scheme. Unless a separate mark is given for a unit, a missing or incorrect unit will normally mean that the final calculation mark is not awarded. Exceptions to this general principle will be noted in the mark scheme.
7	<u>Guidance for chemical equations</u> Multiples / fractions of coefficients used in chemical equations are acceptable unless stated otherwise in the mark scheme. State symbols given in an equation should be ignored unless asked for in the question or stated otherwise in the mark scheme.

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Annotations guidance for centres

Examiners use a system of annotations as a shorthand for communicating their marking decisions to one another. Examiners are trained during the standardisation process on how and when to use annotations. The purpose of annotations is to inform the standardisation and monitoring processes and guide the supervising examiners when they are checking the work of examiners within their team. The meaning of annotations and how they are used is specific to each component and is understood by all examiners who mark the component.

We publish annotations in our mark schemes to help centres understand the annotations they may see on copies of scripts. Note that there may not be a direct correlation between the number of annotations on a script and the mark awarded. Similarly, the use of an annotation may not be an indication of the quality of the response.

The annotations listed below were available to examiners marking this component in this series.

Annotations

Annotation	Meaning
✓	correct point or mark awarded
✗	incorrect point or mark not awarded
^	information missing or insufficient for credit
A	allow or accept
I	incorrect or insufficient point ignored while marking the rest of the response
CON	contradiction in response, mark not awarded
BOD	benefit of the doubt given
ECF	error carried forward applied
SEEN	point has been noted, but no credit has been given or blank page seen

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Annotation	Meaning
✔ 1	correct awarding one mark from marking point or marking group 1. similar numbered ticks are used for marking point or marking groups 2, 3, 4 etc.
	pages are linked together
	used to highlight parts of an extended response
	used to highlight parts of an extended response
PAG	Point already given
MR	Maximum mark reached
	Key point attempted / working towards marking point / incomplete answer / response seen but not credited / blank page seen
MAX	Maximum number of marks for a marking point has been awarded.

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Mark Scheme Abbreviations:	
;	separates marking points
/	alternative responses for the same marking point
R	reject the response
A	accept the response
I	ignore the response
ecf	error carried forward
AVP	any valid point
ora	or reverse argument
AW	alternative wording
underline	actual word given must be used by candidate (grammatical variants excepted)
( )	the word / phrase in brackets is not required but sets the context
max	indicates the maximum number of marks that can be given
MP	marking point

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Question	Answer	Marks	Guidance
1(a)(i)	two temperatures recorded that are below 100 (°C) and the final temperature is lower than the starting temperature **;**	**1**	
1(a)(ii)	table drawn with minimum 2 columns and a header line **;** appropriate headings with units for time: (number of) pieces / AW, (of beetroot) **and** time / s **;** recording of times for 1, 2, 4 **and** 8 pieces of beetroot and time for '1' must be 120 **;** trend – less time for 8 pieces than for 2 pieces **;**	**4**	**I** test-tube / number unqualified **R** sec(s) for seconds **R** units / headings, in data cells (including test-tube)
1(a)(iii)	conclusion that matches results, i.e. the, higher / AW, the <u>surface area</u>, the greater the (rate of) <u>diffusion</u> / **ora** **<u>;</u>**	**1**	**A** faster / more / less time for, <u>diffusion</u> **I** description of the results
1(a)(iv)	*independent variable:* surface area (of beetroot) **;** *dependent variable:* time (for liquid to become the same colour as test-tube 1) **;**	**2**	**A** number / amount, of pieces (of beetroot)
1(a)(v)	*any one from:* (use a) thermostatically-controlled water-bath **;** insulate **;** check the temperature of water / use a thermometer, **and**, replace the hot water / heat **;**	**1**	**A** cover with a lid / cover with foil / cover with aluminium (foil) **A** idea of replacing the hot water with water, at the initial temperature, with each repeat **I** use a thermometer unqualified / monitor temperature unqualified

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Question	Answer	Marks	Guidance
1(a)(vi)	*any two from:* *idea that* shaking, (intensity / AW), may not be, consistent / AW **;** *idea that it is* difficult to compare colours / (colours are) subjective **;** *idea that* beetroot is still in some test-tubes but not in test-tube **S ;** idea that 20 seconds (between observations) is too long / AW ;	**2**	**A** mixing for shaking **A** observing colour change by eye (is hard to judge)
1(a)(vii)	*any one from:* cut away from, body / fingers / hand **;** cut (downwards) onto the, white tile / flat surface / hard surface **;**	**1**	

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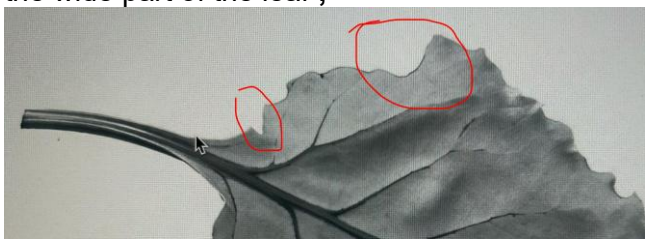
Question	Answer	Marks	Guidance
1(b)(i)	**O**utline – single clear line no shading **;** **S**ize – length at least 109 mm **;** **D**etail 1 – the 'v' shaped notch **and** the clear 'step' that identifies the wide part of the leaf **;**  **D**etail 2 – midrib as a double line that, continues into / connects with, the petiole **and** at least 2 pairs of offset veins (not opposite) **and** <u>all</u> veins touching the midrib **;**	**4**	**O A** two minor errors **O A** open petiole **O I** rubbed out lines / end of petiole **O R** shading / stippling / hatching / use of ruler / compass **O R** major errors e.g. large gaps **S R** if drawing, touches print / encloses print / goes off the page **A** midrib as a double line that peters out **A** open ends on veins and midrib **A** double lined veins touching on one side only **R** if midrib stops before petiole

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Question	Answer	Marks	Guidance
1(b)(ii)	**PQ** = 61 ±1 (mm) **;** 74.4 (mm) **;;**	**3**	MP1 correct measurement of line **PQ** **A** measurement in cm if units changed on the answer line MP2 correct calculation of actual size with their measurement for **PQ** ÷ 0.82 **R** if magnification (×) symbol given on the answer line MP3 correct rounding to one decimal place **ecf** from previous step **PQ** of 60 mm gives 73.2 mm **PQ** of 62 mm gives 75.6 mm

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Question	Answer	Marks	Guidance
2		**6**	**A** labelled diagrams
	1 *(independent variable)* at least two different temperatures **;**		
	2 (*dependent variable)* number / amount, of bubbles **OR** volume of, gas / carbon dioxide, produced **;**		MP2 **A** time for methylene blue to decolorise / circumference or volume of balloon / height of foam / time for limewater to go cloudy / time for bicarbonate indicator to go yellow / time for DCPIP to turn colourless / size of dough after set time / concentration of ethanol
	3 and **4** (*method)* **;;** • gas syringe (for volume of gas) / collecting gas over water / displacement • use of a thermostatically controlled water-bath • *idea of* time for equilibration before taking measurements • yeast added to, water / sugar solution **OR** yeast suspension • AVP (that is appropriate for the dependent variable given)		**A** respirometer **A** making dough **AVP** e.g. use of oil on top of yeast suspension (so respiration is anaerobic)
	5, **6** & **7** *(variables kept constant)* **;;;** • type / species / AW, of yeast • volume / mass / concentration, of yeast • volume / mass / concentration, of (named) sugar (solution) • measuring over set time period **OR** measuring time taken for set volume of gas to be produced (or other dependent variable) • pH		
	8 at least three trials / two more repeats **;**		
	9 relevant safety precaution **;**		e.g. use of, goggles / gloves / tongs

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Question	Answer	Marks	Guidance
3(a)(i)	DCPIP **;**	**1**	
3(a)(ii)	blue–black **;**	**1**	
3(b)(i)	*any two from:* (same) variety of (seed) potato **;** (same) number planted in each m^2 / (same) planting density **;** (same) growing period **;**	**2**	
3(b)(ii)	axes labelled with units **;** suitable linear scale and data occupies at least half the grid in both directions **;** six points plotted accurately ± half a small square **;** suitable line drawn **;**	**4**	*x-axis* – mass of fertiliser / kg per hectare **A** kg $hectare^{-1}$ **and** *y-axis* - yield / tonnes per hectare **A** tonnes $hectare^{-1}$ **A** ha for hectare **R** if plot points that are larger than one small square if dot-to-dot, <u>all</u> points joined (± ½ small square) with a ruler **and** no extrapolation beyond ½ small square at either end if smoothed line, line must, touch / come within ½ small square of, <u>all</u> points **and** no sag of more than one small square **and** no extrapolation beyond ½ small square at either end **R** feathered / thick lines (wider than ½ a small square)
3(b)(iii)	(as mass of fertiliser increased, the potato yield) increased and then, decreased (slightly) / became constant **;**	**1**	
3(b)(iv)	intercept indicated on graph at 90 kg **;** answer consistent for intercept at 90 kg ± half a small square **;**	**2**	

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Question	Answer	Marks	Guidance
3(b)(v)	36.9 (%) **;;;**	**3**	MP1 correct selection of data: 32.5 and 44.5 or 12(.0) MP2 correction calculation to any number of significant figures e.g. working shown for a percentage change e.g. (12 ÷ 32.5) × 100 = 36.923 MP3 correct rounding to three significant figures **ecf** from previous step
3(c)	biuret (solution) **;**	**1**	

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