Cambridge Assessment International Education

Cambridge IGCSE™

BIOLOGY **0610/62**

Paper 6 Alternative to Practical **October/November 2023**

MARK SCHEME

Maximum Mark: 40

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge International will not enter into discussions about these mark schemes.

Cambridge International is publishing the mark schemes for the October/November 2023 series for most Cambridge IGCSE, Cambridge International A and AS Level components, and some Cambridge O Level components.

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Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently, e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

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GENERIC MARKING PRINCIPLE 5: Marks should be awarded using the full range of marks defined in the mark scheme for the question (however**;** the use of the full mark range may be limited according to the quality of the candidate responses seen).
GENERIC MARKING PRINCIPLE 6: Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

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	‘List rule’ guidance 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 Calculation specific guidance

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 Guidance for chemical equations

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.

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

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Question	Answer	Marks	Guidance
1(a)(i)	table drawn with minimum three columns and a header line **;** appropriate column / row headings **;** correct recording of 12, colours / results **;**	**3**	
1(a)(ii)	the greater the temperature the greater the, enzyme / amylase, activity / AW / ora **;**	**1**	
1(a)(iii)	temperature **;**	**1**	
1(a)(iv)	*any three from:* (number of) drops of iodine (solution) **;** volume of amylase / 2 cm^3 amylase **;** concentration of amylase **;** same enzyme **;** volume of starch (suspension) **;** time for equilibration / AW **;** sample intervals / time intervals **;** number of drops of sample added to iodine (solution) **;**	**3**	
1(b)(i)	*any one from:* *idea that* colour change might take place between sampling times **;** time intervals were too long **;** difficult to judge end point / colour change is subjective / it is qualitative **;**	**1**	
1(b)(ii)	*any one from:* insulate the beaker / AW **;** use a thermostatically controlled water-bath **;** description of using a Bunsen burner and a thermometer to control the temperature **;**	**1**	
1(b)(iii)	to equilibrate / to allow the temperature of the test tube contents to become the same as the water in the beaker / AW ***;***	**1**	

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Question	Answer	Marks	Guidance
2(a)	*independent variable:* **1** (at least) two different, enzyme / lipase, concentrations **;** *dependent variable:* **2** measuring pH after a set time OR measuring time to reach a certain pH **;** *detail of method:* **3** use of pH meter / pH paper / (named) indicator **;** **4** measure / same, initial pH / initial colour **;** **5** control **and** description of the control e.g. using boiled enzyme / water instead of enzyme **;** **6 & 7** *variables kept constant – max two from* **;;** • volume of milk • type of milk / same milk / fat content of milk • volume of, lipase / enzyme • temperature • volume of indicator **8** two or more repeats / total of three or more trials **;** **9** relevant safety precaution e.g. use of goggles / gloves **;**	**6**	
2(b)	add ethanol and (then) water **;** shake **;**	**2**	

Question	Answer	Marks	Guidance
3(a)(i)	outline – single clear line no shading **;** size – frond length at least 114 mm **;** detail 1: 7 bladders drawn **;** detail 2: central midrib shown as a double line at least up to the point at which the midrib branches **;**	**4**	
3(a)(ii)	line **PQ** = 12 ± 1 mm **;** 0.63 **;;**	**3**	MP1 correct measurement MP2 dividing their measurement by 19, **R** if incorrect unit given with the answer MP3 correct rounding to two decimal places A 0.58 / 0.68 if measured as 11 or 13 mm ecf MP2 / MP3 from error in previous step
3(a)(iii)	*any two from:* bladder wrack has more bladders **;** bladders are closer together **;** bladder wrack, has bladders in pairs / either side of mid rib, **or** egg wrack has single bladders **;** bladder wrack has a central mid rib **;** bladder wrack, divides into two at the end / more branched **;** bladder wrack is, wider / thicker / AW, (all the way along) **;** bladder wrack is, lighter / brighter, (in colour) **;** bladder wrack (fronds) are all in the same direction **;** bladder wrack has smaller bladders **;** bladder wrack has rounded ends / smoother **;** AVP **;**	**2**	

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Question	Answer	Marks	Guidance
3(b)(i)	*any two from:* temperature **;** wind(speed) **;** humidity **;** species / type, of seaweed **;** age of seaweed **;** size / length / surface area **;** *idea of* how long the bladder wrack has been out of the water **;** measuring time / interval time (between measuring mass) / sampling times **;** spacing while hung up **;** amount of blotting / blotting time / blotting method / type of blotting paper **;**	**2**	
3(b)(ii)	a result that does not fit the pattern / trend / AW **;**	**1**	
3(b)(iii)	did not include sample 2 in the calculation / AW **;**	**1**	
3(b)(iv)	57 (%) **;;**	**2**	MP1 correct calculation MP2 correct rounding to two significant figures ecf MP2 from incorrect MP1
3(c)	axes labelled with units **;** suitable size with a linear scale and data that occupies at least half of the grid in both directions **;** all seven points plotted accurately ± half a small square **;** suitable line drawn **;**	**4**	
3(d)	biuret **;** DCPIP **;**	**2**	

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