Cambridge Assessment International Education

Cambridge IGCSE™

BIOLOGY **0610/61**

Paper 6 Alternative to Practical **October/November 2020**

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 2020 series for most Cambridge IGCSE™, Cambridge International A and AS Level and Cambridge Pre-U 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
- **ecf** error carried forward
- **AVP** any valid point
- **ora** or reverse argument
- **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
- **Any [number] of**: accept the [number] of valid responses
- **R** reject
- **A** accept (for answers correctly cued by the question, or guidance for examiners)
- **I** ignore as irrelevant
- **AW** alternative wording (where responses vary more than usual)
- **AVP** alternative valid point
- max indicates the maximum number of marks that can be given

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Question	Answer	Marks	Guidance
1(a)(i)	0.5(%) ;	1	
1(a)(ii)	table drawn with a minimum of two columns and a header line ; column and row headings with units ; correct time recorded in seconds for each concentration ;	3	percentage concentration of lipase **and** time / s 25, 38, 77, >300
1(a)(iii)	as the, enzyme / lipase, concentration / percentage, increases the time to change colour, decreases / is faster ; **ora** the higher the enzyme concentration the faster the, fat / milk, is broken down /AW ;	1	
1(b)(i)	*control:* distilled water / L4 / 0% lipase ; *explanation:* to show that lipase / enzyme is causing the change (of colour in the indicator / of pH) ;	2	
1(b)(ii)	L1 = 6 **and** L4 = 8 ;	1	
1(b)(iii)	lipase / enzyme, concentration ;	1	
1(b)(iv)	*any two from:* volume of milk ; total volume of (enzyme) solution ; volume of sodium carbonate solution ; number of drops of, indicator / bromothymol blue, used ;	2	
1(b)(v)	to give enough time for the (contents of the) test-tubes to, reach the temperature of the water-bath / equilibrate AW ;	1	
1(b)(vi)	*idea of:* colour change is subjective / end-point is hard to judge ;	1	
1(c)	add biuret, reagent / solution (to lipase solution) ; colour change (from blue) to purple / lilac / violet / mauve ; wear gloves / safety glasses / goggles ;	3	

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Question	Answer	Marks	Guidance
1(d)	*independent variable* **1** at least three temperatures **;** **2** one below 37°C, one above 37°C, and one at 37°C **;** *new method* **3** method of maintaining temperature described **;** **4** named alternative sources of fat **;** **5** correct reference to emulsion test **6** correct reference to use of a different indicator, e.g. UI ***7 and 8*** *max 2 from given method* ***;;*** • same, volume of sodium carbonate • same number of drops of indicator • same volume of milk • measure time taken for indicator to change colour • idea of equilibrate enzyme and milk before mixing / AW **9 and 10** *max 2 from variables kept constant* ***;;*** • same volume of indicator • same type of milk / fat • same volume of fat **;** • same amount / volume / concentration, of lipase **11** ref. to two or more repeats **;**	**6**	

Question	Answer	Marks	Guidance
2(a)	<table><tr><th>letter on Fig. 2.2</th><th>name of flower part</th><th>number visible</th></tr><tr><td>A</td><td>stigma</td><td>1</td></tr><tr><td>B</td><td>filament</td><td>8</td></tr><tr><td>C</td><td>sepal</td><td>4</td></tr></table> **;;;**	**3**	one mark per row
2(b)(i)	lines: clear single outer line without shading **;** size: X-Y bigger than 35 mm **;** rounded structures inside grain **;** pollen tube top edge with one indentation **;** label to pollen tube **;**	**5**	
2(b)(ii)	line **XY** 35 $\pm$1 (mm) **;** 0.1 mm / 100 µm / 0.01 cm **;;**	**3**	MP1 correct measurement MP2 correct calculation **A** ecf measurement ÷ 350 MP3 correct unit
2(c)(i)	*any two from:* pollen germinated faster / germination rate is higher, in S1 (than S2) (at the start) / AW **; ora** by 60 minutes no difference between (percentage germination) in **S1** and **S2** **;** (pollen in) **S1** stops germinating after 50 minutes / AW **;** only 51% / not all pollen grains, germinated **;**	**2**	
2(c)(ii)	idea that different numbers of pollen were counted on each slide **;**	**1**	
2(c)(iii)	divide the number germinated by the total **;** multiply by 100 **;**	**2**	

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Question	Answer	Marks	Guidance
2(d)	*y*-axis scaled correctly with suitable numbers **;** plot for **B** and **C** correct **and** labelled **;**	**2**	

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