Cambridge O Level

Cambridge Assessment International Education
Cambridge Ordinary Level

BIOLOGY **5090/61**

Paper 6 Alternative to Practical **October/November 2019**

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 2019 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.

Mark schemes will use these abbreviations:

; separates marking points
/ alternatives
() contents of brackets are not required but should be implied
R reject
A accept (for answers correctly cued by the question, or guidance for examiners)
Ig ignore (for incorrect but irrelevant responses)
AW alternative wording (where responses vary more than usual)
AVP alternative valid point (where a greater than usual variety of responses is expected)
ORA or reverse argument
underline actual word underlined must be used by candidate
+ statements on both sides of the **+** are needed for that mark

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Question	Answer	Marks	Guidance
1(a)(i)	syringe / measuring cylinder / graduated pipette **;**	**1**	
1(a)(ii)	*tube A*: decreased / lower **;** *tube B*: increased / higher **;**	**2**	
1(a)(iii)	*tube A*: CO_2 used (by plant) **;** photosynthesis **;** *tube B*: CO_2 produced (by plant) **;** respiration **;**	**4**	
1(a)(iv)	prevent any CO_2 escaping / entering **;** (to prove that) any CO_2 / colour change is caused by the plant in the test-tube **;**	**1**	
1(b)(i)	so lamp was the only source of light **;** light intensity was controlled **;**	**1**	
1(b)(ii)	*factor*: temperature **;** *explanation*: adjust temperature using warm water, cold water / ice as needed / water bath / heat shield **;** OR *factor*: carbon dioxide **;** *explanation*: add (potassium / sodium) hydrogencarbonate / bicarbonate **;**	**2**	
1(b)(iii)	do replicates / repeat measurements **+** mean / average **;**	**1**	
1(b)(iv)	allow plant to equilibrate / get used to new light intensity **AW ;**	**1**	

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Question	Answer	Marks	Guidance
1(b)(v)	light intensity on *x*-axis ; axes fully labelled ; linear scales with values at origin of both + good use of grid ; six points plotted correctly ; smooth curved line through all plotted points, not extrapolated at either end ;	**5**	
1(b)(vi)	17 ; working on graph ;	**2**	
1(b)(vii)	increasing light intensity increases rate of photosynthesis ; initially rapid increase in rate / photosynthesis (below 11) ; later slower increase in rate / photosynthesis (above 11) ;	**2**	
1(b)(viii)	some other factor / temperature / CO_2 may be limiting factor ;	**1**	
1(b)(ix)	gas syringe OR collect gas + measuring cylinder / graduated test-tube ;	**1**	
2(a)	drawing (of whole germinated seed) at least 8 cm long ; outer line drawn with sharp pencil + continuous lines + no shading ; root hairs drawn in correct position along developing root (none immediately behind tip + none near seed) ; root hairs on both sides closest to tip of developing root shorter than those further back ; root hairs correctly labelled ;	**5**	
2(b)	marking and labelling C and D on drawing ; measurement of drawing ; measurement from drawing / 13 (mm) ; correct magnification ;	**4**	
2(c)	hand lens / magnifying glass ;	**1**	

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Question	Answer	Marks	Guidance
3(a)	so she did not know what to expect when tested **;** prevent knowledge of temperature affecting results **;**	**1**	
3(b)	felt colder when moved from 30 °C **;** felt the same when moved from 20 °C **;** felt hotter when moved from 10 °C **;**	**3**	
3(c)	(skin) is less sensitive than thermometer **ORA ;** (skin) detects / senses / responds to a change in temperature **;** (skin) does not measure temperature / does not give reading / value / a temperature or is qualitative **;**	**2**	

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