Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

BIOLOGY **0610/62**

Paper 6 Alternative to Practical **March 2018**

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.

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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.

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Abbreviations used in the Mark Scheme

- ; separates marking points
- / alternatives
- **I** ignore
- **R** reject
- **A** accept (for answers correctly cued by the question, or guidance for examiners)
- AW alternative wording (where responses vary more than usual)
- AVP any valid point
- ecf credit a correct statement / calculation that follows a previous wrong response
- **ora** or reverse argument
- ( ) the word / phrase in brackets is not required, but sets the context
- underline actual word given must be used by candidate (grammatical variants excepted)
- max indicates the maximum number of marks that can be given

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Question	Answer	Marks	Guidance
1(a)(i)	cut on a surface **;** method of care in cutting described **;** gloves / goggles (to avoid stain on body) **;**	**1**	**I** 'cut carefully' unqualified **I** lab coats
1(a)(ii)	table drawn with (ruled) lines and appropriate number of cells **;** column / row, headings with appropriate units for distance **;** two correct distances determined **;**	**3**	
1(a)(iii)	selected correct values **;** selected values ÷ 10 **;**	**2**	ecf from **(a)(ii)**
1(a)(iv)	the higher temperature the faster / further, the stain / water, moves / AW **; ora**	**1**	
1(b)	**1** length / width / surface area / size, of celery (stalk) **;** **2** size / width, of cut pieces **;** **3** species / type (of plant) **;** **4** time in stain **;** **5** concentration (of stain) **;** **6** volume / depth (of stain) **;** **7** type / colour, of stain **;**	**2**	

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>1(c)</td><td>;; ;;
<table><tr><th>source of error</th><th>improvement</th></tr><tr><td>stain, may change temperature / cool down / warm up</td><td>use, water-bath / insulation / temperature controlled room / incubator / fridge / lids / AW</td></tr><tr><td>stalks / xylem tissue, may be different, width / length / size / age / AW</td><td>select stalks of same, size (for width) / age / cut to same length or select celery stalks with same, diameter / number of vascular bundles</td></tr><tr><td>(5 mm) sections were too big to give precise results / AW</td><td>cut thinner sections / cut longitudinally / AW</td></tr><tr><td>stain may still move after stalks removed / length of time on tile different</td><td>do each stalk (experiment) separately / cut both stalks at the same time</td></tr></table></td><td>4</td><td>improvement must match error for both marks but accept improvements without an error or vice versa for 1 mark
I human errors

I thermometers unqualified

A different number of xylem ‘tissue’ for error</td></tr>
<tr><td>1(d)</td><td>independent variable
1 test at least two humidities ;
2 at least two stated humidity values with appropriate units ;
3 method to create different humidity ;

controlled variables
4,5 named controlled variables ;;

dependent variable
6 measure distance travelled, up the stalk by stain / use of a potometer (correct description of potometer use) ;
7 in a set time ;
8 divide distance by time (to determine rate) ;

9 three repeat values at each humidity ;</td><td>6</td><td>mp4,5
• control temperature
• control wind speed / do in still air
• same light, intensity / wavelength
• same carbon dioxide concentration
• same, species / leaf area / age / length

mp6 A volume loss of liquid in beaker / mass loss of ‘hanging’ celery / record number of stain pieces</td></tr>
</table>

Question	Answer	Marks	Guidance
2(a)(i)	**O** clear outline of lumen with one minor break ; **S** lumen larger than 55 mm ; **D** details ;;	**4**	
2(a)(ii)	measurement of AB 55 ± 1 mm ; (x) 36 / 37 ;	**2**	**A** 5.5 cm ecf for incorrect **AB** measurement for max 1
2(b)(i)	40 ;	**1**	**A** response in table if answer in working space does not match
2(b)(ii)	repeat experiment for person 2 ; compare with, the best fit line / other people ;	**1**	**A** repeat (measurement) **I** unexpected result unqualified
2(b)(iii)	**A** axes labelled with units ; **S** linear scale for plotted points to half or more in one dimension ; **P** all plotted points accurate to ±half small square ; **L** suitable best fit line ;	**4**	ecf from **2(b)(i)**
2(b)(iv)	indication on plot at 1 minute ; correct reading from their graph at 1 minute ;	**2**	**I** units ecf correct reading from indication on graph somewhere other than at 1 minute
2(b)(v)	as running time increase breathing rate increases ; levels off / AW ; from 6 minutes / 48 breaths per minute ;	**3**	
2(c)(i)	suitable health comment ; suitable environment for exercise ;	**1**	mp2 e.g. water, level surface, footwear, first aid kit, avoid extreme weather conditions

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Question	Answer	Marks	Guidance
2(c)(ii)	gender (of subjects) ; fitness / health (of subjects) ; age (of subjects) ; speed of, exercise / running ; running surface ; (named) environmental condition ; preparation / resting time (before and / or between runs) ; time interval / point after exercise, used to determine breathing rate ;	**2**	**A** breathing rate to return to resting rate
2(c)(iii)	running time ;	**1**	