Cambridge International AS & A Level

Cambridge Assessment International Education
Cambridge International Advanced Subsidiary and Advanced Level

BIOLOGY **9700/52**

Paper 5 Planning, Analysis and Evaluation **October/November 2018**

MARK SCHEME

Maximum Mark: 30

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 2018 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.

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Mark scheme abbreviations

;	separates marking points
/	alternative answers for the same point
R	reject
A	accept (for answers correctly cued by the question, or by extra guidance)
AW	alternative wording (where responses vary more than usual)
underline	actual word given must be used by candidate (grammatical variants accepted)
max	indicates the maximum number of marks that can be given
ora	or reverse argument
mp	marking point (with relevant number)
ecf	error carried forward
I	ignore
AVP	alternative valid point

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Question	Answer	Marks
1(a)(i)	*independent variable* the side / surface of the leaf **;** *dependent variable* distance / how far the water moves (down) / the decrease (in volume) of the water in the graduated tube AW **;**	**2**
1(a)(ii)	*any six from* **1** *ref. to* cutting plant underwater / airtight seal on cup **;** **2** use upper and lower surfaces **;** **3** suck water into graduated tube and then close / attach clip **;** **4** record the distance moved / volume change at start and end of a time **;** *standardised variables (mp **5** to mp **9**) max 2* **5** method of keeping same light (intensity) **;** **6** method of keeping same temperature **;** **7** same humidity **;** **8** method of keeping same air flow **;** **9** same leaf / type of leaf / species of leaf / use the same plant **;** **10** idea of re-setting water level **;** **11** to obtain at least 3 results for each leaf surface to obtain a mean / identify anomalies **;** **12** low risk / medium risk experiment / stated risk and precaution **;**	**6**

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Question	Answer	Marks
1(b)(i)	*ref. to* measure radius of the area of leaf under the cup **;** *ref. to* (using) πr^2 **;** **or** *ref. to* using a (transparent) grid on the area under the cup **;** count squares **;**	**2**
1(b)(ii)	*any three from* **1** divide water loss by area or by time **;** **2** divide result (from mp **1**) by the variable not used in mp **1 ;** **3** calculate the volume of water loss **;** **4** *ref. to* comparing (measurements) from both sides **;** **5** *ref. to* statistical test / *t*-test (to see if difference is significant) **;**	**3**
1(b)(iii)	*correct axis labels:* *x*-axis: minimum: leaf surface, *y*-axis water (vapour) loss / movement ***;*** *y*-axis: correct volume or distance unit and time unit or area unit on *y*-axis **;** bar(s) are identified and upper leaf surface bar is smaller **;**	**3**

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>1(c)(i)</td><td>any two from

<table>
<tr><td rowspan="2">experimental condition</td><td colspan="5">distance moved by water column / cm per unit time</td></tr>
<tr><td>trial 1</td><td>trial 2</td><td>trial 3</td><td>trial 4</td><td>trial 5</td></tr>
<tr><td>high light intensity</td><td></td><td></td><td></td><td>6.2</td><td></td></tr>
<tr><td>no light</td><td></td><td></td><td>1.5</td><td></td><td></td></tr>
<tr><td>high temperature</td><td>4.4</td><td></td><td></td><td>4.8</td><td></td></tr>
<tr><td>strong air current</td><td></td><td>2.4</td><td></td><td></td><td></td></tr>
</table>
;;</td><td>2</td></tr>
<tr><td>1(c)(ii)</td><td>any one from
high light intensity causes aperture to be wider ; ora

high temperature causes aperture to be wider than strong air currents / no light ; ora</td><td>1</td></tr>
</table>

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Question	Answer	Marks
2(a)(i)	the higher the DDD (of antibiotic / penicillin / macrolide) the higher the <u>percentage</u> of resistant bacteria / AW **;** lower DDD macrolide give greater percentage of resistant bacteria (than penicillin) **;**	**2**
2(a)(ii)	11:3 / 3.7 :1 / 3.67:1 / 3.6 recurring : 1 **;**	**1**
2(b)(i)	*any two from* **1** (both sets of) data are quantitative **;** **2** more than 5 paired observations / AW **;** **3** data shows a normal distribution **;** **4** if data were plotted (on a scatter diagram) would show a linear relationship **;**	**2**
2(b)(ii)	*any two from* **1** there is <u>positive</u> <u>correlation</u> (between quantity of antibiotics used and percentage resistance to the antibiotic) **;** **2** penicillin has a stronger correlation than macrolides **; ora** **3** less than 1% probability / chance that the correlation is due to chance **;** **or** more than 99% certain / confident / sure that the resistance is due to the antibiotic used / DDD **;**	**2**
2(c)	put a standard volume of stock solution into a standard volume of water **;** use new dilution for making the next dilution in the same way as above / AW **;**	**2**

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Question	Answer	Marks
2(d)	*any two from* **1** reliable / reproducible / AW **;** **2** *idea of*: sensitive / able to detect low numbers (of resistant *E. coli*) **;** **3** specific (to resistant *E. coli*) / able to detect resistant *E. coli* **;** **4** cost effectiveness **;** **5** *idea that*: results are similar to the disc diffusion results **;**	**2**