Cambridge International AS & A Level

Cambridge Assessment International Education
Cambridge International Advanced Subsidiary and Advanced Level

BIOLOGY **9700/36**

Paper 3 Advanced Practical Skills 2 **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.

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.

Question	Answer	Marks
1(a)(i)	**H** medium **or** high **and** **W** low **and** **P** medium **or** high **;**	**1**
1(a)(ii)	shows at least **three** more concentrations of **P ;** shows correct volumes of **P** and **W** to make these concentrations **;**	**2**
1(a)(iii)	1. *heading for independent variable*: percentage concentration plant extract **and** before heading for dependent variable **and** no units in body of table **;** 2. *heading dependent variable*: time **and** seconds **and** no units in body of table **;** 3. readings for all samples **;** 4. time for disc to reach the surface increases with decreasing concentration **;** 5. results recorded to nearest whole second **;**	**5**
1(a)(iv)	identifies the independent variable as concentration of plant extract **;**	**1**
1(a)(v)	*any **three** from*: 1. same hydrogen peroxide is used for each test **and** change hydrogen peroxide for each test **;** 2. paper discs have varied amount of plant extract **and** standardise amount of extract **;** 3. paper discs not blotted for same amount of time **and** standardise a way of blotting **;** 4. judging when disc reaches surface **and** marking beaker to see disc reaching end-point **;** 5. discs may stick to the side of beaker **and** use wider beaker **;**	**3**
1(b)(i)	8.6 **;** answer to correct degree of accuracy **;**	**2**

Question	Answer	Marks
1(b)(ii)	1. *x*-axis: percentage concentration of hydrogen peroxide **and** *y*-axis: volume of oxygen produced in 30 seconds / cm^3 **;** 2. scale on *x*-axis: 0.5% to 2 cm, labelled at least every 2 cm **and** scale on *y*-axis: 2.0cm^3 to 2 cm, labelled at least every 2 cm **;** 3. correct plotting of five points using small crosses or dots in circles **;** 4. six plots joined with thin line passing through all points and line is either smooth curve or joined plot to plot **;**	**4**
1(b)(iii)	correct value from graph **;**	**1**
1(b)(iv)	1. more substrate molecules **;** 2. more successful collisions **;** 3. more enzyme substrate complexes formed **;**	**3**

Question	Answer	Marks
2(a)(i)	1. suitable size **and** no shading **and** no cells **;** 2. draws correct sector **and** at least two vascular bundles **;** 3. draws at least minimum number of tissue layers **;** 4. correct proportion of vascular bundle to depth of stem **;** 5. label line **and** label to xylem **;**	**5**
2(a)(ii)	1. lines continuous, thin and sharp **;** 2. draws only four whole xylem vessels **and** each vessel touches at least two other vessels **;** 3. two lines around each vessel **and** three lines where vessels touch **;** 4. at least one vessel with three or more angles **;** 5. label line and label to the cell wall of one vessel **;**	**5**
2(b)(i)	1. counts and records number of eyepiece graticule divisions for line **X**–**Y ;** 2. shows number of eyepiece graticule divisions units for line **X**–**Y** multiplied by 24.6 **;** 3. correct answer **;** 4. correct units **;**	**4**

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>2(b)(ii)</td><td>1. organises comparison into three columns with one column for features and collects only differences ;

any three from:

<table>
<tr><th>feature</th><th>N1</th><th>Fig. 2.2</th></tr>
<tr><td>number of vascular bundles</td><td>many</td><td>one ;</td></tr>
<tr><td>position of vascular bundles</td><td>around edge</td><td>in centre ;</td></tr>
<tr><td>xylem tissue</td><td>oval</td><td>cross shaped ;</td></tr>
<tr><td>central area</td><td>hollow / cells absent</td><td>not hollow / cells present ;</td></tr>
<tr><td>epidermis</td><td>smooth</td><td>rough ;</td></tr>
<tr><td>AVP</td><td>described</td><td>described ;</td></tr>
</table>
</td><td>4</td></tr>
</table>