Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education (9–1)

BIOLOGY **0970/52**

Paper 5 Practical Test **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.

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	Guidance
1(a)	table drawn with (at least) two columns and a line separating headings from data **;** suitable headings **;** four colours recorded / starch presence or absence recorded AND four locations identified **;** blue-black for **W2** AND yellow-brown / clear / AW, for **E** and **W** **;**	**4**	
1(b)(i)	to remove contamination / to remove any starch (solution) / amylase (solution) / to remove the solutions (from the outside of the dialysis tubing bag) **;**	**1**	
1(b)(ii)	*any two from:* as a control / comparison / AW **;** to ensure that it was the enzyme that was causing the effect / AW **;** to keep the starch concentration / volume the same **;**	**2**	
1(b)(iii)	*any two from:* volume of starch (suspension) **;** concentration of starch **;** volume of amylase (solution) **;** concentration of amylase **;** (total) volume of solution (in dialysis tubing bags) **;** volume of water (in test-tubes) **;** time (dialysis tubing bags left in test-tubes) **;** temperature **;** (same) dialysis tubing / (same) diameter or size tubing / (same) surface area of tubing **;**	**2**	
1(c)	(add) Benedict's (solution / reagent) **;** heat / method of heating described **;** (reducing sugars present if) colour changes to (brick-)red / orange / yellow / green **;**	**3**	

Question	Answer	Marks	Guidance
1(d)	(at least) two different temperatures used ; method of maintaining constant temperatures ; *max two from given method* ;; add enzyme (solution) to starch (suspension) rinse tubing and place in test-tubes with distilled water testing with iodine / Benedict's solution stated volume of enzyme / amylase stated volume of substrate / starch stated volume of (distilled) water (in test-tubes) decant into beakers *new method:* same, enzyme / amylase concentration ; same, substrate / starch concentration performing each temperature separately ; testing for results at set time intervals ; use of spotting tile ; two more repeats (for each temperature) ; use of gloves / goggles / tongs / test-tube holders ; AVP ;	**6**	
1(e)	biuret (solution / reagent) ; (positive test gives) colour change to lilac / purple / mauve ;	**2**	

Question	Answer	Marks	Guidance
2(a)(i)	(leaf 6) 26, (leaf 7) 31, (leaf 8) 26 **;**	**1**	all ± 1 mm
2(a)(ii)	28 **;**	**1**	ecf **2(a)(i)**
2(a)(iii)	*axes labelled with units:* average (maximum) leaf width / mm AND light intensity with low medium high **;** *scale and size:* even scale AND plotting area to fill at least half the available grid in both directions **;** *plots and bars:* three bars accurately plotted and of the same width with at least one small square wide gaps between each bar **;**	**3**	
2(a)(iv)	value 12 circled for medium light intensity leaf 7 **;** result is different from other results / it does not fit the pattern / AW **;**	**2**	
2(b)(i)	light intensity **;**	**1**	
2(b)(ii)	(maximum) leaf width / AW **;**	**1**	**I** growth / diameter, of leaf
2(c)(i)	*lines:* all clear, single continuous **;** *size:* minimum 82 mm wide **;** *details:* at least three layers plus stele **;** indented shape of central vascular tissue (see examples)**;**	**4**	
2(c)(ii)	*length of **AB:*** 81 (mm) ±1 (mm) **;** *magnification:* (·) 40–41 **;**	**2**	ecf

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>2(c)(iii)</td><td>any two from:
<table><tr><th>feature</th><th>root / Fig. 2.2</th></tr><tr><td>outer surface</td><td>uneven / AW</td></tr><tr><td>(outer) shape</td><td>circular</td></tr><tr><td>size of whole structure</td><td>small(er)</td></tr><tr><td>cell (walls) in central area</td><td>unbroken</td></tr><tr><td>xylem (cell) position</td><td>central</td></tr><tr><td>size of xylem</td><td>large(r)</td></tr><tr><td>xylem</td><td>are together / joined</td></tr><tr><td>AVP</td><td></td></tr></table>;;</td><td>2</td><td></td></tr>
<tr><td>2(d)(i)</td><td>draw / trace, around the outline of leaf on a grid / AW / place <u>transparent</u> grid on leaf ;
count number of squares occupied / put a dot in each square counted ;
count squares at least half occupied as one square / AW ; ora</td><td>2</td><td></td></tr>
<tr><td>2(d)(ii)</td><td>leaves may differ in length / a leaf may differ in width / AW ;</td><td>1</td><td></td></tr>
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