Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

BIOLOGY **0610/61**

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.

This syllabus is regulated for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

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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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Question	Answer	Marks	Guidance
1(a)(i)	3 ;	**1**	
1(a)(ii)	*idea of:* so that the, green line / pigment / leaf extract, will not, wash off / dissolve (into the solvent) ;	**1**	
1(a)(iii)	type of solvent ; time (for leaving filter paper in the solvent / test tube) ; depth / height, of solvent ; concentration of solvent ; diameter of test-tube ; temperature ; distance of pigment, from the end of the paper / distance between line to solvent ; type of (chromatography) paper ; length of (chromatography) paper ; pH ; method of transfer of pigment to paper / amount of pigment ;	**2**	
1(b)(i)	not using a Bunsen / flames / AW ; using water-bath / electric heater ;	**1**	
1(b)(ii)	distance of orange-yellow pigment 75 ± 1 (mm) **and** distance of solvent front 80 ± 1 (mm) ; 0.94 ;;	**3**	
1(b)(iii)	table drawn with minimum of two columns and header line ; appropriate column / row headings ; three correct Rf values for green, blue-green and yellow and four colours ;	**3**	
1(b)(iv)	green ; moves the least (distance up the paper) / smallest Rf value ;	**2**	

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Question	Answer	Marks	Guidance
1(c)	the extract is more concentrated / contains more chlorophyll or chloroplasts / the spot is smaller / less spread out than a line **;** idea that it is more pure e.g. there is no cell debris in the extract / extract was filtered so was purer **;** the solvent / ethanol / S2 / method 1b, was better at separating the pigments than S1 / 1a / AW **;**	**2**	
1(d)	iodine (solution) **;**	**1**	
1(e)	**1** outline of cells as clear single lines **;** **2** drawing occupies at least half the space available (wider than 65 mm) **;** **3** detail 1: approx. correct shape **and** proportions of **three** cells (i.e. 2 cells on left approx. same total size as the large cell on right) **and** cells up to 10 mm apart **;** **4** detail 2: 6 chloroplasts in smallest cell / 5 chloroplasts in medium cell / 9 chloroplasts in largest cell **;** **5** <u>one</u> chloroplast labelled **;**	**5**	

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Question	Answer	Marks	Guidance
1(f)	**1** using at least 2 different colours of leaf **;** **2** identifying the dependent variable **;** e.g. oxygen / gas production / indicator colour change **3** measuring (dependent variable) after a set time **;** **4** method of collecting gas in a set time **;** e.g. use of a measuring cylinder / gas syringe / counting bubbles / how long it takes leaf discs to surface **5** method to control temperature **;** **6, 7, 8** three from: **;;;** • same surface area / size / age, of leaf / plant • same temperature • same light, intensity / amount • same carbon dioxide, concentration / amount • same volume / amount of water • same volume / concentration / amount, of indicator **9** 2 or more repeats / three or more trials of each leaf colour **;**	**6**	

Question	Answer	Marks	Guidance
2(a)(i)	3 ;	**1**	**A** 3–6
2(a)(ii)	0.004 (mm^3) ;	**1**	**A** 4×10^{-3} or 4 μm^3
2(a)(iii)	4 750 000 / 4.75×10^6 ;	**1**	ecf volume calculated in **2(a)(ii)**
2(b)	*infection:* **D** ; *anaemia:* **A** ;	**2**	
2(c)(i)	axes labelled ; suitable even scale **and** plots occupy at least half the grid in both directions ; all points plotted accurately ±half a small square ; bars drawn ; key ;	**5**	
2(c)(ii)	as age increases % with anaemia increases ; women (%) higher than men up to 74 then men higher ; women show a slow increase (in %) then faster increase (from age 85) / increase for men is constant / AW ;	**2**	
2(c)(iii)	*idea of*: more women than men were sampled ;	**1**	

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