Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

BIOLOGY **0610/62**

Paper 6 Alternative to Practical **February/March 2021**

MARK SCHEME FINAL for examiners

Maximum Mark: 40

Cambridge Assessment International Education – 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	Mark scheme	Mark	Guidance
1 (a)(i)	table drawn with minimum three columns and a header line **;** appropriate column / row headings, with units **; Accept** mm or cm four correct measurements with the stated ranges **;**	3	**MP1 Ignore** extra columns **MP2 Reject** units in data cells **MP3** units must correspond with order of magnitude of measurements
1 (a)(ii)	**S** = 19 ± 1 (mm) and **DW** = 0 (mm) **;**	**1**	**Accept** 1.9 and 0 cm if units stated
1 (a)(iii)	to allow comparison / to calculate the difference accurately / AW **;**	**1**	**Accept** consistent / accurate / AW, results
1 (a)(iv)	water entered, the dialysis tubing bag filled with sucrose / bag **S** / AW (and did not in bag **DW**) **;** concentration gradient, allows water movement / osmosis **;**	**1**	**Accept** osmosis occurred in **S** / water moves in because sucrose (is too big) to move out
1 (a)(v)	sucrose / sugar, concentration (in the dialysis tubing bag) **;**	**1**	**Accept** presence of sucrose / water potential / concentration of solution **Accept** contents / solution, of the bag **Ignore** concentration / solution, unqualified **Reject** volume / amount of solution

Question	Mark scheme	Mark	Guidance
1 (a)(vi)	to identify anomalous results / to calculate an average **;**	**1**	**Accept** look for errors **Ignore** prevent error **Accept** to check the data is reliable
1(b)	*idea of* contamination **;**	**1**	**Accept** changes the concentration (of sucrose)
1(c)	add Benedict's (solution) **;** heat **;**	**2**	**Accept** warm **Ignore** water bath unqualified
1(d)(i) **1** **2** **3**	(initial) length / surface area (of cylinders) **;** (soaking) time **;** type of, potato / same potato **;**	**2**	**Reject** mass of potato **Reject** amount / concentration of sucrose **MP1 Accept** size / shape / volume **MP3 Accept** age (of potato)
1(d)(ii)	(-) 17.1(%) **;;;**	**3**	**MP1** for evidence of dividing by 2.51 **MP2** for correct percentage **MP2** ecf from wrong shown % change calculation **MP3** for correct rounding to one decimal place **MP3** ecf correct rounding from correct working
11(d)(iii)	**A**(xes) – labelled with units **;** **S**(cale) – linear scale and occupies at least half the grid **;** **P**(lot) – first five points plotted accurately ± half a small square **;** **L(**ines) – suitable (curved) line of best fit drawn **;**	**4**	**A** minimum axes labels: (sucrose) concentration / mol per dm^3 and percent change in mass or % change in mass **S Accept** ecf from 1(d)(iii) **P Reject** 'dots' larger than a small square **L** curve must not dip below last point ± 1small square **L Reject** extrapolation of line of more than 1 square beyond first or their last plot points on x axis

Question	Mark scheme	Mark	Guidance
1(d)(iv)	sucrose concentration value at which candidate's graph line intersects at 0.0 percentage change in mass ± half small square **;**	**1**	approximately 0.26 (mol per dm^3)
1(d)(v)	(to allow comparison as) the initial masses were different **;**	**1**	
1 (e)	iodine (solution) **;** blue–black **;**	**2**	**MP2 Accept** black / dark blue / indigo
2(a)(i)	Outline - single clear outer line no shading **;** Size - size use at least half available space **;** Detail **;;**	**4**	**S** width ≥ 7 cm or height ≥ 6 cm **S Reject** drawings into text or off page **D1:** 6 to10 seeds each side (correctly positioned) **D2:** cut surface and edge of fruit shown (*idea that* 3D)
2(a)(ii)	method of extracting juice / preparing tomato **;** add DCPIP **;** becomes colourless if (vitamin C) present **;**	**3**	**MP2 Accept** DCPIP turns pink **MP2 Accept** blue colour disappears
2(b)	length of line **PQ** = 106 ± 1 (mm) **;** 2.1 mm **;; Accept** 2 mm	**3**	**MP1** correct measurement **MP2** correct manipulation of formula i.e. their length ÷ 50 **MP2** ecf from **MP1** **MP3** correct unit **MP3 Accept** cm or µm if matches calculated value e.g. 0.21 cm

Question	Mark scheme	Mark	Guidance
2(c) **1**	at least 3 different temperatures **;**	**6**	
2	method of maintaining the different temperatures **;**		
3	moist medium for growing seeds described e.g. soil / cotton wool / agar **;**		**MP3 Accept** in a dish / test-tube etc., with moisture
4	large number of seeds at each temperature / two or more further repeats (of entire experiment) **;**		**MP4 Accept** ≥3 seeds (per temperature)
5	count the number of seeds germinated after a particular time / measure time taken for seeds to germinate **;**		**MP5 Accept** growth for germination
6	observation of germination described **;**		**MP6 Accept** appearance of shoot / root / seed leaves etc.
7&8&9	variables kept constant **;;;**		**MP7, 8 or 9** • volume of water (used) **Accept** humidity • pH • variety of (tomato) seed / age of seeds • oxygen (concentration) • type of soil or growing medium / AW
10	relevant safety precaution **;**		**MP10** e.g. use gloves / forceps (to, handle soil ***/*** avoid allergens / protect from heat) or washing hands afterwards