CO-ORDINATED SCIENCES **0654/62**

Paper 6 Alternative to Practical **October/November 2019**

MARK SCHEME

Maximum Mark: 60

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
1(a)	<table><tr><td>Yellow / green / orange / red ;</td><td>Purple / lilac ;</td><td>orange / brown / yellow</td></tr><tr><td>Blue **and** blue;</td><td colspan="2">Blue-black;</td></tr></table>	**4**
1(b)	(yogurt) protein; **<u>reducing</u>** sugar ; (rice water:) starch ;	**3**
1(c)	Benedict's / (reducing) sugar ;	**1**
1(d)	any **one** from: same volume / amount of food samples ; same volume / amount / concentration / batch of Benedict's ; (leave for) same time ; same temperature ;	**1**
1(e)	check reagents working / (confirm) colours for a positive result ;	**1**
1(f)(i)	ethanol / alcohol and water ; white emulsion ;	**2**
1(f)(ii)	cannot see result AW ;	**1**

Question	Answer	Marks
2(a)	clear and continuous outline ; larger than original ; central detail ; seeds visible ;	4
2(b)(i)	42 ;	1
2(b)(ii)	line drawn and correct measurement ;	1
2(b)(iii)	correct calculation ;	1

Question	Answer	Marks
3(a)(i)	measuring cylinder ;	1
3(a)(ii)	(time = 180 s) 36.5 ; (time = 270 s) 35.0 ;	2
3(a)(iii)	can only read to half a division / graduations are 1 °C ;	1
3(b)(i)	linear scale and using at least half of grid ; at least 4 points correctly plotted to within ½ square within the first 180 seconds ;	2
3(b)(ii)	best-fit smooth curve including one maximum ;	1
3(b)(iii)	maximum temperature read correctly from graph ; maximum temperature marked on graph ;	2
3(b)(iv)	copper / zinc sulfate ;	1
3(b)(v)	displacement / exothermic / redox ;	1
3(c)	best-fit line allows for a maximum between readings ;	1

Question	Answer	Marks
4(a)	add copper sulfate **and** blue ppt ;	1
4(b)(i)	**Max two from:** same number / amount / mass of chips ; same size / surface area of chips ; same temperature ; same volume / amount of acid / HKL / solution ;	2
4(b)(ii)	**H** (most) **L** **K** (least) ; faster bubbling / more bubbles in H / more concentrated / slower bubbling / less bubbles in K / least concentrated;	2
4(c)	white ppt ; white ppt ; barium nitrate and silver nitrate in correct position in table and no other reagents ;	3

Question	Answer	Marks
5(a)	48 ;	1
5(b)	18.5 ;	1
5(c)	to ensure that all the water is at the **same** temperature ;	1
5(d)(i)	29.5 ;	1
5(d)(ii)	33 ;	1
5(e)(i)	12390 ;	1
5(e)(ii)	13860 ;	1
5(f)(i)	1470 ;	1
5(f)(ii)	correct substitution / manipulation ; 1.04 (J / g °C) ;	2
5(g)	**Max two from:** no lagging / lid / insulation ; heat / energy loss ; not all glass at same temperature ; water T not same as glass T water left in beaker after pouring ; volume of hot water approximate ; mass of beaker only to nearest g / rounding (the balance) reading ; transfer hot water too slowly ; misreading thermometer / misreading mass ;	2
5(h)	insulate beaker(s) / use a lid / measure the volume with measuring cylinder ;	1

Question	Answer	Marks
6	**circuit diagram**: cell in series with wire (and switch) ; voltmeter in parallel with the wire ; ammeter in series with the wire ; (cell) voltmeter, ammeter symbols correct ; **method**: take readings of V and I ; for three (or more lengths) / more lengths ; repeats – each length ; **key variables**: thickness / radius / diameter / cross sectional area of wire ; material / type of wire ; temperature of wire ; **table**: headings: l, V, I, R ; and all correct units present ; **conclusion**: compare readings of R and l (in the table) / plot graph of R vs l ;	**7**