Cambridge IGCSE™

PHYSICAL SCIENCE **0652/51**

Paper 5 Practical Test **October/November 2020**

MARK SCHEME

Maximum Mark: 40

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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.

Science-Specific Marking Principles

1	Examiners should consider the context and scientific use of any keywords when awarding marks. Although keywords may be present, marks should not be awarded if the keywords are used incorrectly.
2	The examiner should not choose between contradictory statements given in the same question part, and credit should not be awarded for any correct statement that is contradicted within the same question part. Wrong science that is irrelevant to the question should be ignored.
3	Although spellings do not have to be correct, spellings of syllabus terms must allow for clear and unambiguous separation from other syllabus terms with which they may be confused (e.g. ethane / ethene, glucagon / glycogen, refraction / reflection).
4	The error carried forward (ecf) principle should be applied, where appropriate. If an incorrect answer is subsequently used in a scientifically correct way, the candidate should be awarded these subsequent marking points. Further guidance will be included in the mark scheme where necessary and any exceptions to this general principle will be noted.
5	'List rule' guidance For questions that require *n* responses (e.g. State **two** reasons …): • The response should be read as continuous prose, even when numbered answer spaces are provided. • Any response marked *ignore* in the mark scheme should not count towards *n*. • Incorrect responses should not be awarded credit but will still count towards *n*. • Read the entire response to check for any responses that contradict those that would otherwise be credited. Credit should **not** be awarded for any responses that are contradicted within the rest of the response. Where two responses contradict one another, this should be treated as a single incorrect response. • Non-contradictory responses after the first *n* responses may be ignored even if they include incorrect science.

6   Calculation specific guidance

Correct answers to calculations should be given full credit even if there is no working or incorrect working, **unless** the question states 'show your working'.

For questions in which the number of significant figures required is not stated, credit should be awarded for correct answers when rounded by the examiner to the number of significant figures given in the mark scheme. This may not apply to measured values.

For answers given in standard form (e.g. $a \times 10^n$) in which the convention of restricting the value of the coefficient (a) to a value between 1 and 10 is not followed, credit may still be awarded if the answer can be converted to the answer given in the mark scheme.

Unless a separate mark is given for a unit, a missing or incorrect unit will normally mean that the final calculation mark is not awarded. Exceptions to this general principle will be noted in the mark scheme.

7   Guidance for chemical equations

Multiples / fractions of coefficients used in chemical equations are acceptable unless stated otherwise in the mark scheme.

State symbols given in an equation should be ignored unless asked for in the question or stated otherwise in the mark scheme.

Question	Answer	Marks
1(a)(i)	initial temperature and highest temperature for 1 piece recorded ; 4 times ; temperatures increasing ;	3
1(a)(ii)	all changes in temperature calculated correctly	1
1(b)	2 from: magnesium disappears (dissolves) ; no bubbles (effervescence) ; temperature stops rising (changing) ; no fizzing sound ;	2
1(c)	as (number of magnesium) pieces increases so temperature <u>change</u> increases ;	1
1(d)	concentration of acid / volume of acid / amount of acid ;	1
1(e)(i)	red **and** orange / yellow / dark green / blue ;	1
1(e)(ii)	lighted splint **and** pops **;** hydrogen ;	2
1(f)	flask / closed container and delivery tube ; syringe / upturned measuring cylinder or burette <u>in water</u> ;	2

Question	Answer	Marks
2(a)	h_O present ;	1
2(b)	J values correct ;	1
2(c)(i)	axes labelled correct orientation, with quantity and unit ;	1
	linear scales (plots occupying at least ½ grid) ;	1

Question	Answer	Marks
	plots all correct to ½ small square and precise plots ;	1
2(c)(ii)	well-judged line and thin line ;	1
2(d)	triangle method seen on graph / method of calculating the gradient ;	1
	G in range 15.0 to 18.0 ;	1
2(e)	any one from: use of a darkened room / brighter lamp ; mark position of centre of lens on holder ; place metre rule on bench / clamp in position ; ensure object and (centre of) lens are same height (from the bench) ; object <u>and</u> lens <u>and</u> screen perpendicular to bench ; move <u>screen</u> slowly / back and forth (to obtain best image) ; repeat and average ;	1
2(f)	any suitable improvement: use translucent screen and view from behind fix ruler / grid to screen support ruler in a stand ;	1

Question	Answer	Marks
3(a)(i)	values of l increasing ;	1
	all l values to the nearest millimetre ;	1
3(a)(ii)	values of x correct ;	1
3(b)	correct calculation of k_1 ;	1
	2 or 3 significant figures ;	1
3(c)(i)	$l_C < l_D$;	1

Question	Answer	Marks
3(c)(ii)	correct calculation of x_2 ;	**1**
3(d)	correct calculation of k_2;	**1**
3(e)	expect YES matching justification e.g. values too far apart / not close enough ;	**1**
3(f)	any one from: repeat and take an average use a greater range of loads / more loads ;	**1**

Question	Answer	Marks
4	At least one mark must be awarded from each section. The remaining three marks can be awarded from any section. **apparatus** juice in container (test-tube / beaker / conical flask / evaporating basin); use of (dropping) pipette / burette measuring cylinder ; **method** add indicator ; add NaOH (slowly) ; until indicator (just) changes colour ; repeat (with same juice) / repeat with the other juice ; safety: goggles / gloves as substance(s) corrosive ; control: same amount of juice / indicator ; **measurements** measure amount / volume of juice ; measure volume NaOH / take burette readings at start and end OR measure volume NaOH / number of drops needed to change colour of indicator OR measure volume of juice at start and juice + NaOH at end ; **processing and use of results** larger volume / more drops of NaOH means larger amount of acid ; volume NaOH used = amount NaOH initially - amount NaOH left at end / difference between burette readings OR volume NaOH used = amount NaOH and juice at end – amount of juice ;	7