CAMBRIDGE
International Education

Cambridge IGCSE™

CO-ORDINATED SCIENCES **0654/63**

Paper 6 Alternative to Practical **May/June 2026**

MARK SCHEME

Maximum Mark: 60

Published

This mark scheme contains the instructions and marking guidance that our examiners used to mark candidate responses for this component.

Before they start marking, examiners complete a standardisation process. They review a range of candidate responses and discuss the mark scheme in detail to agree which answers can and cannot be accepted. Examiners award marks where it is clear that candidate responses have met the requirements of the mark scheme. These requirements may vary between different components or different versions of the same component, depending on the exact requirements of the question and the candidate responses seen during the standardisation process.

Sometimes, our mark schemes may allow marks to be awarded to responses which contain elements that are factually incorrect or for content not covered by the syllabus. We do this in response to the demands of a specific question to support candidates and make sure that our assessments are fair. However, these allowances should not be used as a guide for teaching and learning.

We cannot discuss the mark scheme with schools, and we recommend that schools read the mark scheme together with the assessment material and the Principal Examiner Report for Teachers.

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General marking principles

All examiners must apply these marking principles when marking candidate responses.

1	Examiners must award marks for each response in line with: • the specific **content** defined in the mark scheme • the specific **skills** defined in the mark scheme or in the level descriptions • the **standard of response** required as exemplified by the standardisation scripts.
2	Examiners must award **whole marks** (not half marks, or other fractions).
3	Examiners must award marks **positively**. This means that: • marks are not deducted for errors or omissions • marks are awarded for correct/valid answers as defined in the mark scheme and also for **other valid answers** which go beyond the scope of the syllabus and mark scheme referring to your team leader as appropriate • the quality of spelling, punctuation and grammar are judged **only** when the mark scheme indicates that these features are **specifically assessed** in the question. However, the meaning of all responses must be unambiguous.
4	Examiners must **consistently** apply the requirements of the mark scheme and any rules for what to do when candidates have not followed instructions correctly.
5	Examiners must use the **full range of marks** defined in the mark scheme, unless limited by the quality of the candidate responses seen.
6	Examiners must award marks according to the mark scheme and **must not** award marks with grade thresholds or grade descriptions in mind.

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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.

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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.

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Annotations guidance for centres

Examiners use a system of annotations as a shorthand for communicating their marking decisions to one another. Examiners are trained during the standardisation process on how and when to use annotations. The purpose of annotations is to inform the standardisation and monitoring processes and guide the supervising examiners when they are checking the work of examiners within their team. The meaning of annotations and how they are used is specific to each component and is understood by all examiners who mark the component.

We publish annotations in our mark schemes to help centres understand the annotations they may see on copies of scripts. Note that there may not be a direct correlation between the number of annotations on a script and the mark awarded. Similarly, the use of an annotation may not be an indication of the quality of the response.

The annotations listed below were available to examiners marking this component in this series.

Annotations

Annotation	Meaning
	correct point or mark awarded
	incorrect point or mark not awarded
BOD	benefit of the doubt given
FT	follow through
NBOD	benefit of doubt was considered, but the response was decided to not be sufficiently close for benefit of doubt to be applied.
TV	response is too vague or there is insufficient detail in response
ECF	error carried forward applied
^	information missing or insufficient for credit
	unclear response
I	incorrect or insufficient point ignored while marking the rest of the response

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Annotation	Meaning
R	incorrect point or mark not awarded
CON	contradiction in response, mark not awarded
LNK	two statements are linked
SEEN	point has been noted, but no credit has been given or blank page seen
	key point attempted / working towards marking point / incomplete answer / response seen but not credited / blank page seen
BP	blank page

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Mark Scheme Abbreviations

;	separates marking points
/	separates alternative responses for the same marking point
Allow	accept (a less-than-ideal answer which should be marked correct)
Ignore	ignore (mark as if this material was not present)
AND	indicates that two or more parts of a response are required for the mark
AVP	alternative valid point
AW	alternative wording (where responses vary more than usual)
NOT	indicates an incorrect response that would contradict another otherwise correct alternative
OR	alternative responses for the same marking point
owtte	or words to that effect
underline	actual word given must be used by candidate (grammatical variants excepted)
ecf	error carried forward
ORA	or reverse argument
( )	the word / phrase in brackets is not required but sets the context
max	indicates the maximum number of marks

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Question	Answers	Marks	Guidance
1(a)	1.0 ; 4.8 ;	**2**	**ALLOW** 1 IF no marks scored **ALLOW 1** max for 1.2 **AND** 5.0
1(b)(i)	axes labelled with variable and units ; suitable linear scale where plotted points cover ⩾ ½ of grid and all points are able to be plotted ; points plotted correctly to ± ½ a small square ;	**3**	position **and** cm **and** time/t **and** minutes/min **DO NOT ALLOW** m for min **ALLOW** 1 error
1(b)(ii)	straight line of best fit ;	**1**	needs to have points above and below their line, any anomalous points need to be circled
1(b)(iii)	line from x ais to curve and from curve to y-axis ; correct reading from graph ;	**2**	ecf from M1 **ALLOW** ± 1 small square
1(c)(i)	3.8 ;	**1**	**ecf** volume at 60 min – volume at 0 min **ALLOW** 1 sf if the subtraction gives 1 sf
1(c)(ii)	0.063 ; cm / minute ;	**2**	**ecf** 1ci ÷ 60

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Question	Answers	Marks	Guidance
1(d)	reduces volume in apparatus / pressure reduces in apparatus ;	**1**	**ALLOW** replaces the volume of gas **ALLOW** the liquid moves to take the space left by the removed oxygen **NOTE** oxygen and carbon dioxide removed is insufficient **IGNORE** sucks up the water / sucks / draws/ pulls up the water
1(e)	drop of liquid doesn't move ;	**1**	**DO NOT ALLOW** drop of liquid does not move as much **IGNORE** discussions re oxygen and carbon dioxide

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Question	Answers	Marks	Guidance
2(a)(i)	(trial 1) 10 ,6, 3, 1 ;	**1**	
2(a)(ii)	(trial 2) 4, 10, 3, 3 ;	**1**	
2(a)(iii)	(averages) 7, 8, 3, 2 ;	**1**	ecf on ai and aii must be a whole number
2(b)(i)	damp and dark ;	**1**	**ECF** their table **ALLOW** dark **IGNORE** 8
2(b)(ii)	in the centre / randomly / 5 in each ; prevents bias ;	**2**	**ALLOW** equal chance of going to any chamber / equal chance of going to all chambers **IGNORE** fair test / free will
2(b)(iii)	you don't know which of the two trials is correct / need a third one to find two that match / averages are close for 2 areas ;	**1**	**IGNORE** accuracy / more reliable data **NOTE** to exclude / identify anomalies is insufficient

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Question	Answers	Marks	Guidance
3(a)(i)	boiling tube containing liquid ; thermometer bulb in the liquid not touching the bottom or sides of the tube ;	**2**	**DO NOT ALLOW** Bunsen burner **IGNORE** measuring cylinder 
3(a)(ii)	bottom of meniscus at 25.0 ;	**1**	**DO NOT ALLOW** straight line at 25 (with no meniscus)
3(a)(iii)	46.0 ; 72.5 ; – 4.5 ;	**3**	**IGNORE** 46 **IGNORE** + on 46 and 72.5
3(a)(iv)	+24.5 **and** + 52.0 ; – 25.5 ;	**2**	**ecf** **ALLOW** + 52 IF no marks scored **ALLOW max 1** for 3 correct subtractions with no signs
3(a)(v)	haven't used the **same** mass / amount of each substance ;	**1**	**ALLOW** haven't measured the mass / amount of the solid **IGNORE** initial temperatures different

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Question	Answers	Marks	Guidance
3(b)(i)	thermal energy / heat transferred to the surroundings ;	**1**	**ALLOW** thermal energy / heat loss **ALLOW** tubes not insulated
3(b)(ii)	gains thermal energy / heat (from the surroundings) ;	**1**	
3(b)(iii)	Insulate ;	**1**	
3(c)	the water (on the outside of the tube) freezes ;	**1**	

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Question	Answers	Marks	Guidance
4	**apparatus** thermometer and its use method ; timer and its use method ; **method** add manganese(IV) oxide to hydrogen peroxide and measure time at two different temperatures ; **measurements** time for: reaction to stop or to collect specific volume of gas or the volume of gas collected in that time ; temperature of the hydrogen peroxide (at the start) ; repeat to exclude anomalies ; minimum 5 sensible temperatures ; **control** volume / concentration / amount of hydrogen peroxide ; mass / amount of manganese(IV) oxide ; surface area of manganese(IV) oxide ; **processing** calculate rate as volume / time or 1 / time draw graph of rate (if processed) against temperature ; describe relationship from graph e.g. if straight line through origin then proportional etc. ; look at results and as temperature goes up does the rate increase decrease (or stay the same) ;	**7**	**ALLOW** measure the reaction time **ALLOW** time for the bubbling to stop **ALLOW** bubbles for volume **IGNORE** time for the reaction to occur **IGNORE** measure rate of reaction If temperatures are specified there must be 5 which are above 0° and below 100 °C **Ignore** a stated conclusion or hypothesis **ALLOW** volume of gas against temperature and calculating gradient need to be comparative

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Question	Answers	Marks	Guidance
5(a)(i)	17 ° ;	**1**	
5(a)(ii)	3.9 ; 3.8 ;	**2**	
5(a)(iii)	3.5 2.9 2.0 0.8 ;	**1**	**ecf** on sf in (**a)(ii)**
5(a)(iv)	the larger the **angle**, the smaller the **time** ;	**1**	**ALLOW** ora **DO NOT ALLOW** proportional / inversely proportional **IGNORE** negative relationship
5(b)(i)	ensure the horizontal is at 0° **AND** view reading at eye level ;	**1**	place protractor on the bench (next to the ramp) **AND** read the angle at 90 °
5(b)(ii)	greater time measured so reaction time is a smaller proportion ;	**1**	**ALLOW** smaller % error / smaller random error / reaction time has less effect (on longer ramp) / reaction time is less significant **IGNORE** longer time is easier to measure **NOTE** the time is longer is insufficient **NOTE** lower margin of error is insufficient
5(b)(iii)	the force the car is pushed with **and** just let go of the car ;	**1**	**IGNORE** push with the same force

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Question	Answers	Marks	Guidance
6(a)(i)	(D =) 9.0 ;	**1**	**ALLOW** ± 0.1 cm ALLOW 9
6(a)(ii)	(r =) 0.9 ;	**1**	**ECF** from **(a)(i)**
6(a)(iii)	3.05451 ; 3.05 ;	**2**	**ECF** from **(a)(iii)** 3 sf only
6(a)(iv)	7.4 ;	**1**	
6(a)(v)	2.4 ;	**1**	**ECF** from **(a)(iii)** and **(a)(iv)** 2.426229508 to min 2 sf truncated or rounded
6(b)(i)	10 % of 2.4 = 0.24 ; 2.4 + 10 % = 2.64 and no (less than 2.8) ; OR 10 % of 2.8 = 0.28 ; 2.8 – 10% = 2.52 and no (greater than 2.4) ;	**2**	ecf on **6(a)(v)** OR 110 % of 2.4 = 2.64 and no ;; OR 90 % of 2.8 = 2.52 and no ;;

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Question	Answers	Marks	Guidance
6(b)(ii)	so they are the same distance apart at all points ;	**1**	**IGNORE** to stop marble moving
6(c)(i)	volume being measured is smaller ; density is larger ;	**2**	**ALLOW** only part of the ball is submerged (so the volume of water displaced is smaller) / not all of the ball is submerged / not all of the ball displaces water **IGNORE** the ball floats IF M1 is larger volume then ecf smaller density
6(c)(ii)	suggestion of how to fully submerge e.g. gauze in cylinder or held down with small volume object (pin etc) ;	**1**	**ALLOW** place a heavy object on the ball and measure volume then subtract the volume of the object

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