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CAMBRIDGE
International Education

Cambridge IGCSE™

COMBINED SCIENCE **0653/31**

Paper 3 Theory (Core) **May/June 2026**

MARK SCHEME

Maximum Mark: 80

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.

This document consists of **15** printed pages.

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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
	information missing or insufficient for credit
	incorrect or insufficient point ignored while marking the rest of the response
	contradiction in response, mark not awarded
	benefit of the doubt given
	error carried forward applied
	response is too vague or there is insufficient detail in response
	incorrect point or mark not awarded

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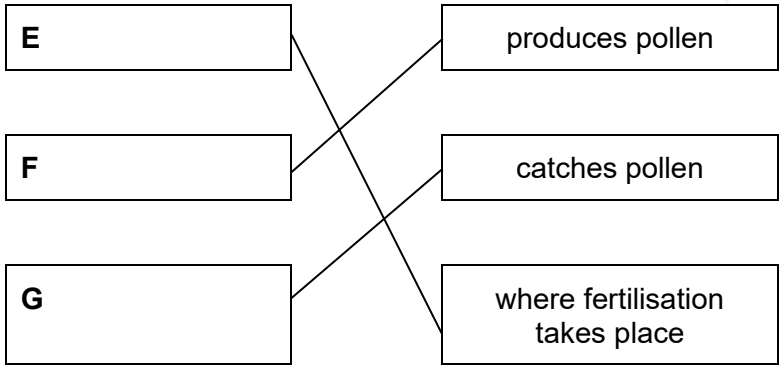
Annotation	Meaning
SEEN	point has been noted, but no credit has been given or blank page seen
	key point attempted / working towards marking point / incomplete answer / response seen but not credited / blank page seen
BP	blank page
	unclear response
LNK	two statements are linked
FT	follow through
IR	irrelevant material that does not answer the question

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Question	Answer	Marks	Guidance
1(a)(i)	circular DNA ; plasmid ;	**2**	**Allow** DNA / genetic material / chromosome **Allow** DNA strand(s) **Do not accept** nucleus / RNA **Allow** nucleoid
1(a)(ii)	protein synthesis ;	**1**	**A** produces / creates / builds / forms protein
1(a)(iii)	nucleus / mitochondria ;	**1**	**Allow** lysosome **Ignore** vacuole **Do not accept** chloroplast
1(b)	modify ; antibiotic ; resistant ;	**3**	
1(c)	white blood cells ;	**1**	**Allow** white cells (‘blood’ is in the question) **Allow** WBC **Do not accept** lymphocytes

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Question	Answer	Marks	Guidance
2(a)	 ; ; *all three correct = 2 marks* *one or 2 correct = 1 mark*	**2**	
2(b)(i)	sperm ;	**1**	
2(b)(ii)	testes ;	**1**	more than one circled = 0 marks
2(c)(i)	carnivore: mouse / (small) bird / snake / hawk ; tertiary consumer: snake / hawk ;	**2**	
2(c)(ii)	energy transferred from plants to grasshopper ; energy transferred from grasshopper to mouse ;	**2**	**Allow** grasshopper eats plants **Allow** named part of plant e.g. flower / leaf **Do not accept** mouse eats plants **Allow** mouse eats grasshopper
2(d)	(glucose +) oxygen ; carbon dioxide + water ;	**2**	**Allow** correct formulae **Allow** either order **Ignore** energy

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Question	Answer	Marks	Guidance
3(a)(i)	line labelled **P** pointing to outer part of any vascular bundle ;	**1**	**Allow** correct line labelled phloem
3(a)(ii)	transpiration ;	**1**	
3(b)(i)	*any **two** from:* protein ; involved in metabolic reactions ; (biological) catalyst ;	**2**	 **Allow** speeds up reaction and is not used up / lowers activation energy
3(b)(ii)	enzyme activity increases and then decreases with increasing temperature ; maximum at 37 (°C) ;	**2**	**Allow** It increases and decreases as temperature increases **Ignore** It increases and decreases **Allow** ± 1 °C **Allow** AW for 'maximum'
3(c)(i)	A unit containing the community of organisms and their environment, interacting together. ;	**1**	
3(c)(ii)	*any **two** from:* (for) housing ; crop production ; livestock production ; extraction of natural materials ; freshwater / marine pollution ;	**2**	**List rule** **Allow** roads / railways / construction **Allow** farming for one mark if crop production or livestock production not seen **Ignore** for food / hunting / animals for food **Allow** mining or named examples, e.g. mining / oil drilling / extraction of building materials / cutting down forests for timber / wood / fuel / paper **Ignore** for natural resources alone **Allow** water pollution / overfishing

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>4(a)</td><td>
<table>
<tr><th>particle</th><th>relative mass</th><th>relative charge</th><th>location in atom</th></tr>
<tr><td>proton</td><td>1</td><td>+1 / 1+</td><td>nucleus</td></tr>
<tr><td>neutron</td><td>1</td><td>0 / no charge / none</td><td>nucleus</td></tr>
<tr><td>electron</td><td>1/1840</td><td>−1</td><td>shells</td></tr>
</table>
; ; ;</td><td>3</td><td>each correct column = 1 mark
Allow + 1 for relative mass of proton and neutron
Allow 1 / 1 800 to 1 / 2 000 or 0.0005 or negligible for relative mass of electron
Do not accept 0 or dash for relative mass electron

Do not accept 1 alone for relative charge of proton
Ignore neutral for charge of neutron

Allow centre / middle of atom for nucleus</td></tr>
<tr><td>4(b)</td><td>2,8,4 ;</td><td>1</td><td>Allow other punctuation / full stop / colon / no punctuation</td></tr>
<tr><td>4(c)</td><td>shared pair of electrons (between two atoms) ;</td><td>1</td><td>Allow statement that electrons are shared and shows a dot and cross with two electrons shared
Ignore share one electron
Do not accept two or more shared electron</td></tr>
<tr><td>4(d)</td><td>SiC_4H_{12} ;</td><td>1</td><td>Allow atoms in any order
Allow SiC4H12
Do not accept SiC^4H^{12}
Ignore 1 after Si</td></tr>
<tr><td>4(e)</td><td>large molecule built up from many smaller molecules or monomers ;</td><td>1</td><td>Allow long chain molecule</td></tr>
<tr><td>4(f)</td><td>alloy ;</td><td>1</td><td></td></tr>
</table>

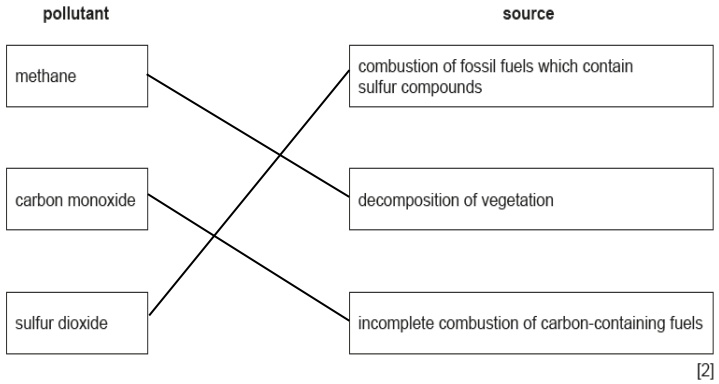
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Question	Answer	Marks	Guidance
5(a)(i)	water AND carbon dioxide ;	**1**	**Allow** in either order **Allow** correct formula
5(a)(ii)	**thermal** energy transferred to surroundings ;	**1**	**Allow** thermal energy is given out **Allow** heat energy for thermal energy **Ignore** energy unqualified **Ignore** increase in temperature of surroundings
5(a)(iii)	red ;	**1**	
5(a)(iv)	filtration ;	**1**	**Allow** filtering / filter
5(b)	calcium ;	**1**	
5(c)(i)	cathode (negative electrode) labelled ; electrolyte labelled ;	**2**	**Do not accept** label that does not touch cathode
5(c)(ii)	*any **two** from:* inert / unreactive ; (good) electrical conductivity / conducts electricity ; high melting point ;	**2**	 **Allow** electrical conductor **Ignore** insoluble / heat resistant / corrosion resistant

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0653/31 Mark Scheme June 2026

Question	Answer	Marks	Guidance
6(a)	(78%) nitrogen (21%) oxygen (1%) noble gases and carbon dioxide *1 mark for one correct gas matched to correct sector ;* *2 marks fully correct ;*	**2**	**Allow** argon and carbon dioxide **Ignore** other named noble gases **Do not accept** any other named gas
6(b)	 [2] ; ; *all three correct = 2 marks* *one or 2 correct = 1 mark*	**2**	
6(c)(i)	$CH_4(\mathbf{g}) + H_2O(\mathbf{g}) \rightarrow CO(\mathbf{g}) + \mathbf{3}\ H_2(\mathbf{g})$ *balanced ;* *correct state symbols ;*	**2**	**Allow** 1 written in gaps for CH_4, H_2O and CO **Allow** correct multiples **Do not accept** (G) for state symbols
6(c)(ii)	to increase the rate (of reaction) ;	**1**	**Allow** to speed up the reaction
6(d)	high melting point ; high density / more dense ;	**2**	**Allow** boiling point for melting point **Allow** hard / strong / magnetic

Question	Answer	Marks	Guidance
7(a)(i)	evidence of $W = mg$ / 2.6 × 9.8 ; 25 ; N ;	3	**Correct numerical answer = 2 marks** **Allow** equation in any form **Do not accept** incorrect substitution **Allow** 25.48 / 25.5 **Allow** 2 marks for 2.6 × 10 = 26 (use of g = 10) **Ignore** 26 with no working **Allow newtons**
7(a)(ii)	matter ; gravitational ;	2	**Allow** material **Ignore** particles / atoms / molecules **Allow** gravity
7(b)(i)	evidence of volume = (26 – 20 =) 6 (cm^3) ; evidence of $\rho = m \div V$ / 47 ÷ 6 ; 7.8 (g / cm^3) ;	3	**Correct answer = 3 marks** **Allow** equation in any form **Allow** 47 ÷ 20 or 47 ÷ 26 for 1 mark only **Do not accept** other incorrect substitution **Allow** 7.83 / 7.833 / 8
7(b)(ii)	any stated value less than 1.0 (g / cm^3) ;	1	**Ignore** < 1.0 **Do not accept** 0

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Question	Answer	Marks	Guidance
8(a)	(idea that) student **S** stops the stop-watch when he hears the (reflected) sound / the echo ; speed = *d* ÷ time ; measure distance to the wall and multiply by two / measure distance to the wall and back / measure distance to the wall and divide the time by two ;	**3**	**Allow** records the time taken to hear the (reflected) sound / echo **Ignore** stops stop-watch when he hears the clap alone **Allow** speed is distance divided by time **Do not accept** incorrect substitution **Allow** 2 **marks** (M2 and M3) for speed = *d* ÷ time/2 or 2d ÷ time
8(b)	Sound 1 and sound 2 are produced by vibrating sources ; The amplitude of sound 1 is greater than the amplitude of sound 2 ;	**2**	List Rule applies
8(c)	refracted ; red ; violet ;	**3**	**Allow** 1 mark for red and violet in reverse order

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Question	Answer	Marks	Guidance
9(a)	less than ; greater than ; less than ; greater than ;	4	
9(b)(i)	evidence of unit conversion, I = 2.5 A ; evidence of $P = IV$ / (V =) 30 ÷ 2.5 ; 12 (V) ;	3	**Correct answer = 3 marks** **Allow 2 marks** (M2 and M3) for incorrect/omitted unit conversion leading to an answer of 1.2×10^n **Allow** equation in any form **Allow** 30 / 2 500 for 1 mark **Do not accept** incorrect substitution **Allow** (V =) 0.012 for 2 marks
9(b)(ii)	*star:* Sun ; *planet:* Mercury / Venus / Earth / Mars / Jupiter / Saturn / Uranus / Neptune ; *dwarf planet:* Pluto ;	3	 Ceres / Haumea / Makemake / Eris

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