CAMBRIDGE
International Education

Cambridge IGCSE™

PHYSICS **0625/43**

Paper 4 Theory (Extended) **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.

 [Turn over

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.

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.

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
A	allow or accept
AE	evaluation attempted
I	incorrect or insufficient point ignored while marking the rest of the response
CON	contradiction in response, mark not awarded
BOD	benefit of the doubt given
ECF	error carried forward applied
NAQ	response has not answered question

Annotation	Meaning
RE	rounding error
SEEN	point has been noted, but no credit has been given or blank page seen
SF	error in number of significant figures
TE	transcription error
TV	response is too vague or there is insufficient detail in response
T	answer outside the tolerance of the mark scheme
	used to highlight parts of an extended response
	used to highlight parts of an extended response
MO	mandatory mark not awarded
SC	special case

Acronyms and shorthand in the mark scheme

Acronym / shorthand	**Explanation**
A mark	Final answer mark which is awarded for fully correct final answers.
C mark	Compensatory mark which may be scored when the final answer (A) mark for a question has not been awarded.
B mark	Independent mark which does not depend on any other mark.
M mark	Method mark which must be scored before any subsequent final answer (A) mark can be scored.
Brackets ( )	Words not explicitly needed in an answer, however if a contradictory word/phrase/unit to that in the brackets is seen the mark is not awarded.
Underlining	The underlined word (or a synonym) must be present for the mark to be scored. If the word is a technical scientific term, the word must be there.
/ or **OR**	Alternative answers any one of which gains the credit for that mark.
ORA	Or reverse argument.
owtte	Or words to that effect.
Ignore or **I**	Indicates either an incorrect or irrelevant point which may be disregarded, i.e., not treated as contradictory.
insufficient	an answer not worthy of credit on its own
CON	An incorrect point which contradicts any correct point and means the mark cannot be scored.
cao	correct answer only

Question	Answer	Marks	Guidance
1(a)(i)	constant speed **OR** constant velocity	**B1**	**TV** zero acceleration **A** steady speed **OR** stable speed
	(constant) deceleration	**B1**	**A** (constant) negative acceleration
1(a)(ii)	4500 (m)	**A3**	SC for 2 marks 5100 (m)
	area under graph **OR** one area calculated	C1	
	{92 × 45} + ½ {18 × 45} **OR** 4140 + 405	C1	
1(a)(iii)	2.5 (m/s^2)	**A2**	
	(a =) $\Delta v / (\Delta) t$ **OR** 45 / 18	C1	**A** s for v
1(b)	1.5×10^6 (J)	**A2**	
	(E_k =) ½ $m v^2$ **OR** ½ × 820 × 60^2	C1	

Question	Answer	Marks	Guidance
2(a)	(moment =) force × perpendicular distance (from pivot) = 14 × 19.6 (= 274 N cm)	**B1**	must be in words or symbols **A** (moment =) force × distance **A** 14 × 19.6
2(b)	3.8 (cm)	**A2**	
	(d =) {14 × 19.6} / 72 **OR** 274 / 72 **OR** 270 / 72	C1	**A** 14 × 19.6 = 72 × d **A** anticlockwise moment = clockwise moment
2(c)	8.6×10^{-4} (m^2)	**A2**	
	(A =) F / p **OR** 72 / 8.4×10^4	C1	**A** 14 / 8.4×10^4

Question	Answer	Marks	Guidance
3(a)	any **two** from: • particles move (fast) **OR** particles have (high) kinetic energy **OR** particles have (large) momentum • particles collide with the walls of the balloon • pressure is (total) force (due to collisions) per unit area	**B2**	**A** atoms or molecules *for* particles **I** particles move faster / gain kinetic energy / gain momentum **A** particles collide with balloon **A** $p = F / A$
	collisions cause force on walls of the balloon **OR** particles have change of momentum on collision with walls owtte	**B1**	**A** collision with walls produces an impulse **I** force = rate of change of momentum
3(b)(i)	25 (m^3)	**A2**	
	pV = constant **OR** $p_1V_1 = p_2V_2$	C1	**A** $V_2 = \{110 \times 12\} / 52$ **A** 2.5×10^N
3(b)(ii)	4900 (m)	**A3**	**A** 4800 (m) if use of g as 10 clearly shown in working
	(Δh =) E_p / mg **OR** $120\,000 / \{9.8 \times 2.5\}$	C1	**A** $\{120 \times 10^N\} / \{9.8 \times 2.5\}$ **A** use of g as 10 if equation given in symbols first
	conversion of 120 (kJ) to 120 000 (J) **OR** 4.9×10^N	C1	

Question	Answer	Marks	Guidance
4(a)(i)	(ΔE =) $mc\Delta\Theta$	**M1**	must be in words or symbols **A** T for Θ **I** t for Θ **I** Q for E
	200 × 4.2 × 58 **OR** 48 720 (J)	**A1**	**A** 200 × 4.2 × (80 – 22) **A** 0.2 × 4200 × 58 **TV** 0.2 × 4.2 × 58
4(a)(ii)	1200 (W)	**A2**	
	(P =) (Δ)E / t **OR** 49 000 / 41 **OR** 48 720 / 41 **OR** 1.2 × 10^N	C1	**A** W for E **I** T for t **I** Q for E **I** W = (Δ)E / t
4(a)(iii)	any **one** from: some energy is transferred to the pan / air / surroundings not 100% efficient transfer from hotplate to pan / water	**B1**	**A** heat *for* energy **A** energy dissipates to the surroundings **A** energy is used for evaporation **TV** some energy is transferred to the hotplate
4(b)	any **two** from: (gas particles are) further apart **OR** (particles) fill the container (gas particles have) greater kinetic energy no/less force between (gas) particles	**B2**	**A** atoms or molecules *for* particles **TV** particles are not in contact **TV** particles have more space to move **CON** take the shape of the container **A** higher speed / fast **A** no / weak bonds between particles **I** collide less frequently / with less force **I** collide rather than slide pass each other **A** clear reverse argument throughout

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>5(a)(i)</td><td>parallel</td><td>B1</td><td></td></tr>
<tr><td>5(a)(ii)</td><td>sound (waves) OR (seismic) P-waves OR (seismic) primary waves</td><td>B1</td><td>• A ultrasound
• TV waves in a spring
• TV seismic
• TV water waves
• CON S / secondary (waves)</td></tr>
<tr><td rowspan="2">5(b)(i)</td><td>7.5 Hz</td><td>A2</td><td></td></tr>
<tr><td>(f =) v / λ OR 0.12 / 0.016 OR Hz</td><td>C1</td><td>A s for v</td></tr>
<tr><td>5(b)(ii)</td><td><table><tr><th>wave property</th><th>decreases</th><th>stays the same</th><th>increases</th></tr><tr><td>wavelength</td><td></td><td></td><td>✓</td></tr><tr><td>frequency</td><td></td><td>✓</td><td></td></tr><tr><td>speed</td><td></td><td></td><td>✓</td></tr></table>1 mark for each correct row</td><td>B2</td><td>CON more than 1 tick per row</td></tr>
<tr><td>5(c)(i)</td><td>diffraction</td><td>B1</td><td></td></tr>
<tr><td rowspan="2">5(c)(ii)</td><td>decrease size of gap</td><td>B1</td><td>A gap size similar to wavelength</td></tr>
<tr><td>increase wavelength</td><td>B1</td><td>A decrease frequency
A use deeper water</td></tr>
</table>

Question	Answer	Marks	Guidance
6(a)(i)	correct location indicated (and labelled I)	**B1**	
6(a)(ii)	ray from O reflected at the mirror and goes to eye	**B1**	**I** arrow direction
	angle of reflection = angle of incidence	**B1**	**A** mark intent approximately equal angles
6(b)(i)	0.9(0)	**A2**	
	(n =) sin$i$ / sin$r$ **OR** sin 25 / sin 28	C1	**A** $n_1\sin_1 = n_2\sin_2$
6(b)(ii)	correct angle indicated and labelled c	**B1**	
6(b)(iii)	ray reflected in glass	**B1**	**I** arrow direction **CON** any ray leaving the glass

Question	Answer	Marks	Guidance
7(a)	electron(s)	**B1**	
7(b)(i)	light-dependent resistor / LDR	**B1**	
7(b)(ii)	4.5 (V)	**A3**	
	$R = V / I$ **OR** (I =) 12 / 640 **OR** (I =) 0.01875	C1	**A** (V_2 =) $V_s R_2 / \{R_1 + R_2\}$
	(V =) 0.01875 × 240	C1	**A** {12 × 240} / {240 + 400}
7(c)	decreases decreases	**A2**	
	(current) decreases	C1	

Question	Answer	Marks	Guidance
8(a)	current	**B1**	**A** voltage / p.d. **A** flow of charge / moving electrons **I** electricity
	magnetised **OR** an electromagnet	**B1**	**TV** magnet **TV** magnetic **TV** ferromagnetic **CON** electromagnetic
	completes owtte	**B1**	**A** e.g. switches on
8(b)(i)	27 (V)	**A2**	
	(V_s =) {$V_p \times N_s$} / N_p **OR** {240 / V_s} = {360 / 40}	C1	**A** {40 / 360} × 240
8(b)(ii)	d.c. does not produce the changing magnetic field needed for electromagnetic induction **OR** a.c. required to produce changing magnetic field needed for electromagnetic induction	**A2**	
	there is no changing magnetic field	C1	

Question	Answer	Marks	Guidance
9(a)(i)	arrow indicating clockwise direction	**B1**	
9(a)(ii)	poles consistent with current direction	**B1**	clockwise expect X – S / south **and** Y – N / north anticlockwise expect X – N / north **and** Y – S / south if **9(a)(i)** blank or current direction other than clockwise or anticlockwise **accept** X – S / south **and** Y – N / north **CON** positive / negative
9(a)(iii)	increase current increase magnetic field strength	**B2**	**A** increase voltage (across cylinder) **A** decrease gap between poles **A** stronger magnet
9(b)(i)	(allows) <u>current</u> in the coil to change direction (reverses the current) every half turn / 180 degrees **OR** when the coil is vertical/at right angles to the magnetic field	**B2**	
9(b)(ii)	any **one** from: transfer <u>current</u> to the coil (from circuit) provide continuous contact (between split ring commutator and circuit) owtte prevent wires tangling	**B1**	

Question	Answer	Marks	Guidance
10(a)	similarity: (same) number of protons	**B1**	**A** proton number **I** atomic number **CON** number of electrons
	difference: three (more) neutrons	**B1**	**A** three (more) nucleons **I** mass number
10(b)(i)	$^{14}_{7}\mathrm{N}$	**B1**	
	$^{0}_{-1}\beta$	**B1**	**A** e *for* β
10(b)(ii)	a neutron changes into a proton (plus an electron)	**B1**	**A** nucleus loses a neutron and gains a proton
10(c)	17 000 (years)	**A2**	
	3 half-lives	C1	

Question	Answer	Marks	Guidance
11(a)	(nuclear) fusion	**B1**	**CON** fission
	hydrogen nuclei join	**B1**	**A** combine / fuse *for* join **I** atoms / molecules
	(into / to form) helium	**B1**	**I** atoms / molecules
11(b)	ultraviolet	**B1**	**A** uv
	electromagnetic	**B1**	**A** e.m.
11(c)	1.3 (A)	**A2**	
	(I =) Q / t **OR** 240 / 180	C1	