

EDEXCEL · GCSE COMBINED SCIENCE 1SC0

Physics — Higher Tier, Paper 2

June 2025 exam series

MARK SCHEME

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Mark Scheme (Results)

Summer 2025

Pearson Edexcel GCSE
In Combined Science Physics
(1SC0) Paper 2PH

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General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

Mark schemes have been developed so that the rubrics of each mark scheme reflects the characteristics of the skills within the AO being targeted and the requirements of the command word. So for example the command word 'Explain' requires an identification of a point and then reasoning/justification of the point.

Explain questions can be asked across all AOs. The distinction comes whether the identification is via a judgment made to reach a conclusion, or, making a point through application of knowledge to reason/justify the point made through application of understanding. It is the combination and linkage of the marking points that is needed to gain full marks.

When marking questions with a 'describe' or 'explain' command word, the detailed marking guidance below should be consulted to ensure consistency of marking.

Assessment Objective		Command Word	
Strand	Element	Describe	Explain
AO1*		An answer that combines the marking points to provide a logical description	An explanation that links identification of a point with reasoning/justification(s) as required
AO2		An answer that combines the marking points to provide a logical description, showing application of knowledge and understanding	An explanation that links identification of a point (by applying knowledge) with reasoning/justification (application of understanding)
AO3	1a and 1b	An answer that combines points of interpretation/evaluation to provide a logical description	
AO3	2a and 2b		An explanation that combines identification via a judgment to reach a conclusion via justification/reasoning
AO3	3a	An answer that combines the marking points to provide a logical description of the plan/method/experiment	
AO3	3b		An explanation that combines identifying an improvement of the experimental procedure with a linked justification/reasoning

*there will be situations where an AO1 question will include elements of recall of knowledge directly from the specification (up to a maximum of 15%). These will be identified by an asterisk in the mark scheme.

Combined Science- Physics 1SC0_2PH

Question Number	Answer	Additional guidance	Mark
1(a)(i)	substitution with conversion (2) $(m =) \frac{4.1}{10 \times 0.26}$ (=1.58)	accept 9.8(1) instead of 10 for g throughout alternative method substitution and rearrangement with conversion (2) e.g. $\Delta gpe = 10 \times 0.26 \times 1.6$ (=4.1) Allow for 1 mark: $(m =) \frac{4.1}{10 \times 26}$ allow 26 to any power of 10 for this mark OR $\Delta gpe = 10 \times 26 \times 1.6$ allow 26 to any power of 10 for this mark OR height converted to m 0.26 (m) or 26×10^{-2} (m)	(2) AO 2.1

Question Number	Answer	Additional guidance	Mark
1(a)(ii)	substitution (1) $(v^2 =) \frac{2 \times 4.1}{1.6}$ evaluation of v^2 (1) 5.1(25) evaluation of v (1) 2.3 (m/s)	ecf from part a(i) throughout accept use of 1.58 accept 5.2 (use of 1.58) accept values that round to 2.3 e.g. 2.264 award full marks for the correct answer without working	(3) AO2.1

Question Number	Answer	Additional guidance	Mark
1(a)(iii)	addition of any lubricant / oil / grease	make runway steep(er) use an air track instead streamline trolley	(1) AO 3.3b

Question Number	Answer	Additional guidance	Mark
1(b)	substitution (1) $(P =) \frac{48 \times 10 \times 2.9}{3.4}$ evaluation (1) 409 (W) to 2 s.f. (1) 410 (W)	accept 9.8(1) instead of 10 for g throughout $\frac{480 \times 2.9}{3.4}$ OR $\frac{1392}{3.4}$ accept values that round to 409 accept values that round to 402 (used g = 9.81) accept the result of any calculation to 2s.f. for this mark accept 400 (W) if 402 seen (used g = 9.81) award full marks for the correct answer without working	(3) AO 2.1

Total for Question 1 = 9 marks

Question Number	Answer	Additional guidance	Mark
2(a)	50(Hz) (1)		(1) AO1.1

Question Number	Answer	Additional guidance	Mark
2(b)	substitution (1) (P=) 0.53×230 evaluation (1) 120 (W)	accept values that round down to 120 to 2s.f. e.g. 121.9 or 122 award full marks for the correct answer without working	(2) AO2.1

Question Number	Answer	Additional guidance	Mark
2(c)(i)	A live pin B is incorrect because the mains plug has no negative pin C is incorrect because the neutral pin is at 0 V D is incorrect because the mains plug has no positive pin		(1) AO1.1

Question Number	Answer	Additional guidance	Mark
2(c)(ii)	An explanation linking the fuse melts (1) (so) stops / switches off current (1)	allow fuse blows / breaks circuit is broken allow switches off {charge flow / circuit / TV / appliance / supply / electricity / voltage / power / energy}	(2) A02.2

Question Number	Answer	Additional guidance	Mark
2(c)(iii)	any one from circuit breaker (1) earth (wire/pin) (1) surge protector (1) cable clamp (inside plug) (1) insulation / armouring (1) socket protector/cover (1)	accept RCD / ELCB / RCCB / GFCI / MCB allow ground accept SPD accept rubber coating accept plug cover ignore switch / fuse / fuse box	(1) A01.1

Question number	Answer	Additional guidance	Mark
2(d)	an explanation that links any two attributes of cable 2 compared with cable 1 from (wires have a) greater (cross-sectional) area (1) lower resistance (1) (safely carry a) higher current (1)	accept reverse arguments (wires are) thicker/ wider / heavier / larger less likely to overheat if no other marks scored allow 1 mark for less likely to be damaged due to more insulation OWTTE	(2) A03

Total for Question 2 = 9 marks

Question number	Answer	Additional guidance	Mark
3(a)	A P and Q B, C and D are incorrect because at least some of the wax is solid in each case.		(1) AO3

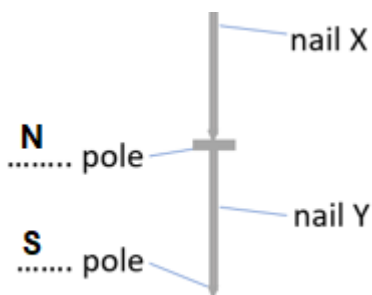
Question number	Answer	Additional guidance	Mark
3(b)	A description to include any two from no longer move (around / past each other) (1) vibrate (1) particles move more slowly (in a solid) (1)	(in a) fixed position have less (kinetic) energy	(2) AO1

Question number	Answer	Additional guidance	Mark
3(c)(ii)	(the volume will) decrease (1)		(1) AO3

Question number	Answer	Additional guidance	Mark
3(c)(iii)	an explanation linking three from specific heat capacity is (much) less than specific latent heat (1) specific heat capacity is 2.1(kJ/kg °C) and specific latent heat is 190 (kJ/kg) (1) less (thermal) energy is transferred (to surroundings during R to S) (1) (thermal) energy transferred (to surroundings) at similar / constant rate (1)	allow reverse arguments less heat is dissipated	(3) AO3

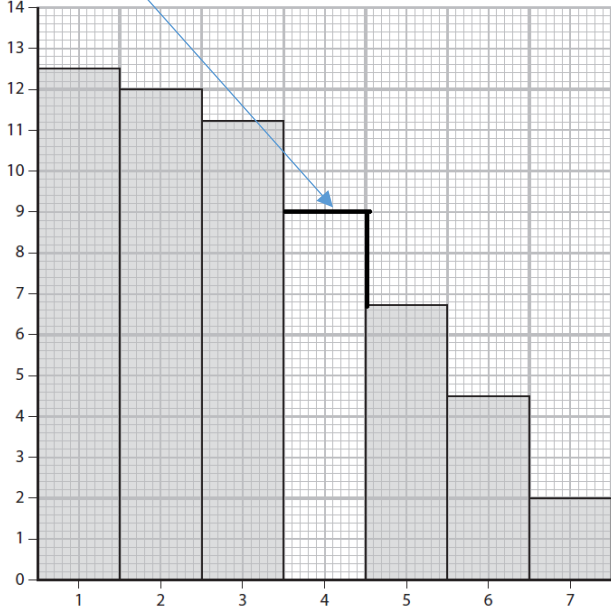
Total for Question 3 = 9 marks

Question number	Answer	Additional guidance	Mark
4(a) (i)	both labels as shown (1)	accept North / north for N South / south for S accept labels at the side e.g.:	(1) AO1



Question number	Answer	Additional guidance	Mark
4(a) (ii)	D induced magnets B and C are incorrect because electric charge is not relevant in this context A is incorrect because permanent magnets would remain attracted		(1) AO1

Question number	Answer	Additional guidance	Mark
4(b) (i)	13		(1) AO2

Question number	Answer	Additional guidance	Mark
4(b) (ii)	Column drawn at height of 9.0 (1) e.g. 	Allow $\frac{1}{2}$ square tolerance must have horizontal and vertical lines drawn ignore shading / fill	(1) A02

Question number	Answer	Additional guidance	Mark
4(b) (iii)	a description to include as number of strips increase, the number of nails (picked up) decreases (1) (relationship is) non-linear (1)	allow reverse argument allow negative correlation one goes up and one goes down allow description of non-linearity e.g. change is not in even steps / non-uniform ignore inversely proportional	(2) A03

Question number	Answer	Additional guidance	Mark
4(b) (iv)	a suggestion to include suitable test (1) expected result (before and after) (1)	put near to a magnet / compass needle put near to (unmagnetised) iron (filings) put next to each other (same end of) nail attracted to both poles of magnet/ compass needle do not pick up (unmagnetised) iron (filings) are not attracted to each other accept reverse test result for magnetised nails	(2) A03

Question number	Answer	Additional guidance	Mark
4(c)	substitution and evaluation of K (1) $(K = 650 \times 3^2 =) 5.85 \times 10^3$ substitution (1) $B \times 6^2 = 5.85 \times 10^3$ rearrangement and evaluation (1) $(B =) 160 \text{ (}\mu\text{T)}$ OR ALTERNATIVE METHOD substitution (1) $650 \times 3^2 = B \times 6^2$ rearrangement (1) $(B =) \frac{650 \times 3^2}{6^2}$ evaluation (1) $(B =) 160 \text{ (}\mu\text{T)}$	distance doubles e.g. $6/3 = 2$ B changes by factor of 4 e.g. $2^2 = 4$ accept values that round to 160 e.g. 162.5 or 163.89 $(B =) \frac{650}{4}$ accept values that round to 160 e.g. 162.5 or 163.89 award 2 marks for a value that rounds to 160 to any other power of ten award full marks for correct answer without working	(3) AO2

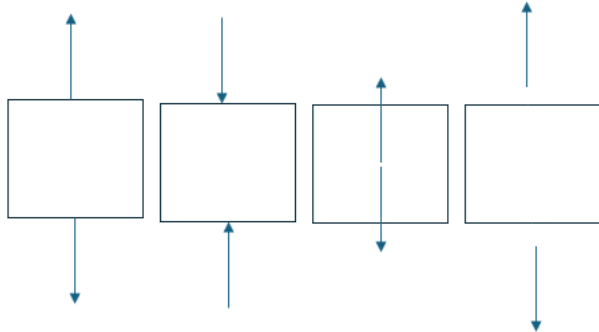
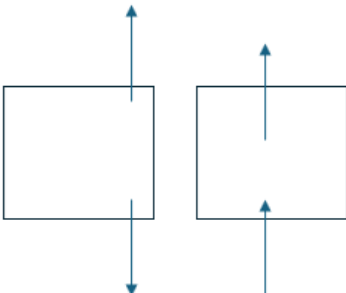
Total for Question 4 = 11 marks

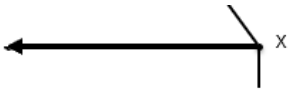
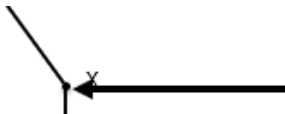
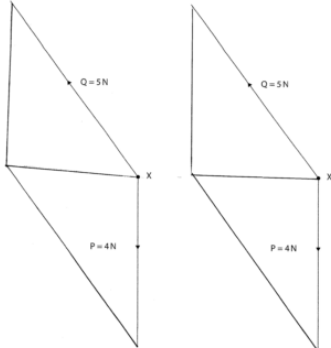
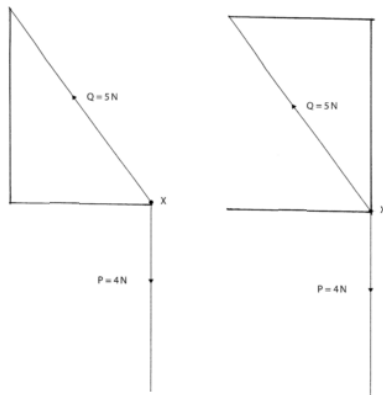
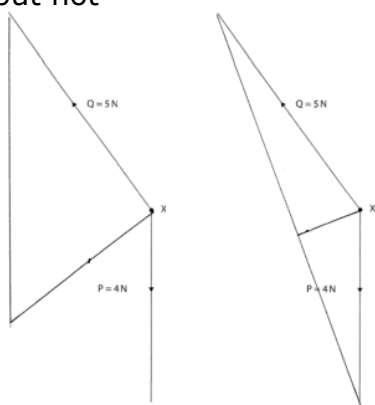
Question number	Answer	Additional guidance	Mark
5(a) (i)	(force of) gravity / weight (acts on spring)		(1) A02

Question number	Answer	Additional guidance	Mark
5(a) (ii)	A Z-Y B is incorrect because it is a sum not a difference of the two lengths C is incorrect because that is the final length of the spring D is incorrect because that is the initial length of the spring		(1) A01

Question number	Answer	Additional guidance	Mark
5(b)(i)	relevant values from graph(1) 8 ($\times 10^{-2}$) and 3.6 seen substitution (1) (energy =) $0.5 \times 3.6 \times 8 (\times 10^{-2})$ evaluation (1) (energy =) 0.14 (J)	accept 8 ($\times 10^{-2}$) and values between 3.6 and 3.7 accept value between 0.14 and 0.15 (J) values between 0.14 and 0.15 (J) to any other power of ten scores 2 marks values between 0.28 and 0.30 (J) scores 2 marks values between 0.28 and 0.30 (J) to any other power of ten scores 1 mark award full marks for correct answer without working	(3) AO2

Question number	Answer	Additional guidance	Mark
5(b)(ii)	45 or 0.45 (1) OR 45 N/m or 0.45 N/cm (2)	allow values between 44 and 47 or between 0.44 and 0.47 allow full marks for values between 44 and 47 N/m or between 0.44 and 0.47 N/cm	(2) A02

Question number	Answer	Additional guidance	Mark
5(b)(iii)	two straight vertical arrows in opposite directions and (if extended) go through centre of the box (judge by eye) (1) label 5N on both arrows (1)	examples  scores this mark  does not score this mark independent mark	(2) A01

Question	Answer	Additional guidance	Mark
5(c)	correct direction (1) any size horizontal (judge by eye) arrow pointing left at point X  or 	if arrow missing or incorrect then allow attempt to find direction by construction of a suitable parallelogram or triangle e.g.  or  but not 	(2) AO2
	indication of size (1) drawn correctly, size judged by eye or any arrow labelled 3 (N) . Allow values between 2.5 and 3.5	independent mark  or 	

Total for Question 5 = 11 marks

Question number	Answer	Additional guidance	Mark
6(a)(i)	selection and substitution (1) (R=) $\frac{9}{6} \times 10^{-3}$ evaluation (1) (resistance =) 1500 (Ω)	1.5 k(Ω) allow 1500 to any other power of ten for 1 mark award full marks for correct answer without working.	(2) A02

Question number	Answer	Additional guidance	Mark
6(a)(ii)	(connect a variable) resistor (1) in series (with the resistor) (1)	accept thermistor/ light dependent resistor/ LDR/ lamp / battery / cell / LED / diode between battery and resistor	(2) A01

Question number	Answer	Additional guidance	Mark
6(b)	C is correct because 0.85 is less than 2V A is incorrect because 0.85 V is greater than 20 mv B is incorrect because 0.85 V is greater than 200 mv D is incorrect because 0.85 V would show a (very) small reading on the scale.		(1) A01

Question number	Indicative content	Mark
*6(c)	Answers will be credited according to candidate's deployment of knowledge and understanding of the material in relation to the qualities and skills outlined in the generic mark scheme. The indicative content below is not prescriptive and candidates are not required to include all the material which is indicated as relevant. Additional content included in the response must be scientific and relevant. Description (may be inferred from circuit diagram(s)) • Connect ammeter in series with resistor(s) • Connect voltmeter across / in parallel with resistor(s) • Move meters to new positions. Circuit diagram(s) (accept any recognisable symbol) • Two resistors in series with a battery • Two resistors in parallel with a battery • An ammeter in series with the resistor(s) and battery • A voltmeter in parallel with the resistor(s) Expected results (allow reverse arguments) • Current (from battery) greater in parallel circuit than in series circuit • Pd across resistor(s) less in series circuit than in parallel circuit • Pd across resistor(s) in parallel circuit same as pd across battery • Pd across battery shared between resistors in series • Current (from battery) shared between resistors in parallel • Current same throughout whole of series circuit	(6) AO1

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1-2	- Demonstrates elements of physics understanding, some of which is inaccurate. Understanding of scientific, enquiry, techniques and procedures lacks detail. (AO1) - Presents a description which is not logically ordered and with significant gaps. (AO1)
Level 2	3-4	- Demonstrates physics understanding, which is mostly relevant but may include some inaccuracies. Understanding of scientific ideas, enquiry, techniques and procedures is not fully detailed and/or developed. (AO1) - Presents a description of the procedure that has a structure which is mostly clear, coherent and logical with minor steps missing. (AO1)
Level 3	5-6	- Demonstrates accurate and relevant physics understanding throughout. Understanding of the scientific ideas, enquiry, techniques and procedures is detailed and fully developed. (AO1) - Presents a description that has a well-developed structure which is clear, coherent and logical. (AO1)

Level	Mark	Additional Guidance	General additional guidance – the decision within levels e.g. - At each level, as well as content, the scientific coherency of what is stated will help place the answer at the top, or the bottom, of that level.
	0	No rewardable material.	
Level 1	1–2	<u>Additional guidance</u> description of that would allow at least two measurements or an expected result of those measurements	<u>Possible candidate responses</u> any two correctly connected meters (may be in different circuits) or resistors in a series and a parallel circuit or current in parallel circuit shared between resistors or Pd of supply shared between resistors in series
Level 2	3–4	<u>Additional guidance</u> descriptions of obtaining two measurements with an expected results of those measurements for at least one circuit or expected results of those comparisons between circuits without description of obtaining measurements	<u>Possible candidate responses</u> a series and a parallel circuit with a correctly connected meter with current in parallel circuit shared between resistors but pd across them is same as supply or (total) current more in parallel than in series circuit and pd across each resistor in series less than in parallel without creditworthy circuit diagram or description of obtaining measurements
Level 3	5–6	<u>Additional guidance</u> descriptions of obtaining comparable measurements with expected results of those comparisons between circuits	<u>Possible candidate responses</u> a series and a parallel circuit with at least one correctly connected ammeter and voltmeter with (total) current more in parallel than in series circuit and pd across each resistor in series less than in parallel

Total for Question 6 = 11 marks

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