



Mark Scheme (Results)

Summer 2025

Pearson Edexcel International GCSE
In Physics (4WSD5) Unit 5P

Edexcel and BTEC Qualifications

Edexcel and BTEC qualifications are awarded by Pearson, the UK's largest awarding body. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information visit our qualifications websites at www.edexcel.com or www.btec.co.uk. Alternatively, you can get in touch with us using the details on our contact us page at www.edexcel.com/contactus.

Pearson: helping people progress, everywhere

Pearson aspires to be the world's leading learning company. Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for our commitment to high standards and raising achievement through innovation in education. Find out more about how we can help you and your students at: www.pearson.com/uk

Summer 2025

Question Paper Log Number P81760A

Publications Code 4WSD5_1P_2506_MS

All the material in this publication is copyright

© Pearson Education Ltd 2025

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.

Question number	Answer	Notes	Marks
1 (a)	C (fuse); <i>A is incorrect because it doesn't break a circuit</i> <i>B is incorrect because it doesn't break a circuit</i> <i>D is incorrect because it doesn't break a circuit</i>		1
(b)	any two from: MP1. idea that wire has resistance; MP2. electrons collide with lattice ions; MP3. idea of transferring <u>energy</u> (from electrons to wire); MP4. increasing vibrations of lattice ions;	Accept answers relating to energy store 'transfer electrically to the thermal store of the wire' for 2 marks Accept lattice, ions, atoms for 'lattice ions' Ignore friction, ignore electrons collide with wire/wall/other electrons Accept '(the wire) gains/releases thermal/heat energy'	2
(c)	any four from: MP1. earth wire is attached to metal case; MP2. if metal case becomes live; MP3. case could give the user an electric shock; MP4. earth wire has low resistance; MP5. (large) current in earth wire; MP6. fuse melts OR idea of circuit breaker breaks circuit; MP7. case is isolated (from the supply);	Accept 'metal' or 'case' for 'metal case' Accept live wire touches metal case Accept electric shock, electrocution, ignore 'shock' by itself Accept charge/electron flows in earth wire, do not accept 'electricity' in the wire	4

Total for Question 1 = 7 marks

Question number	Answer	Notes	Marks
2 (a)	(i) components are connected in series; voltages must add up to 6(.0)V;	ignore voltmeter is in parallel (with the resistor) allow voltages must add up to battery voltage allow 6(.0) – 3.9 = 2.1	2
	(ii) correct substitution into $V = I \times R$; rearrangement; evaluation; e.g. $2.1 = \text{current} \times 290$ $\text{current} = 2.1 / 290$ (current =) 0.0072 (A)	allow ecf from incorrect voltage allow ecf from incorrect voltage 0.0206..., 0.0134... (A) scores 2 marks allow 0.007, 0.00724... (A)	3
	(iii) same answer as (ii);	expect 0.0072 (A) allow if rounded differently to (ii) but still consistent	1
	(iv) correct substitution into $V = I \times R$; rearrangement; evaluation; e.g. $3.9 = 0.0072 \times R$ $R = 3.9 / 0.0072$ (R =) 540 (Ω)	allow ecf from current in (ii) or (iii) allow dimensionally correct rearrangement using incorrect voltage for this mark only e.g. $R = 2.1 / 0.0072$ allow 557, 542, 541.6..., 539, 538.5... (Ω)	3
(b)	(i) thermistor/circuit resistance decreases (as temperature increases);		3

	current increases;	allow idea of less voltage across thermistor	
	resistance of resistor is fixed/does not change AND $V=IR$ (so voltmeter reading increases);	allow idea that battery/total voltage is fixed/6V AND this is shared between thermistor and resistor (so voltmeter reading increases)	
(ii)	any three from:	ignore methods involving adding bulbs to circuit etc. can be awarded from diagram	3
	MP1. place thermistor (and thermometer) into beaker of water;		
	MP2. idea of varying temperature of water / thermistor;		
	MP3. measure reading on voltmeter (at different temperatures);	allow idea of measuring current or calculating resistance (at different temperatures)	
	MP4. plot graph of voltmeter reading against temperature;	allow current / resistance for voltmeter reading	
	MP5. idea of using graph to read off temperature at different voltmeter readings;	allow current / resistance for voltmeter reading	

Total for Question 2 = 15 marks

Question number	Answer	Notes	Marks
3 (a)	idea that reaction time is an issue / eq;	allow student (A) starts/stops stopwatch early/late allow student (B) starts running early/late ignore human error, comments relating to time for sound to travel	1
(b)	(i) selection of $GPE = mgh$; substitution; evaluation to more than 2s.f.; e.g. $GPE = mgh$ $GPE = 67 \times 10 \times 24 \times 0.19$ $GPE = 3055.2 \text{ (J)}$	condone omitting factor of 24 for this mark only allow use of $g = 9.8, 9.81$ ignore POT errors from not converting cm to m allow 3055, 3060, 3100, 2994, 2997.1... (J)	3
	(ii) evaluation of mean; rounded to 3s.f.; e.g. mean time = $(4.28 + 4.95 + 4.65) / 3 = 4.626...$ mean time = 4.63 (s)	independent mark	2
	(iii) substitution into $P = E/t$; evaluation; e.g. power = $3055.2 / 4.63$ power = 660 (W)	allow ecf from (i) and (ii) allow 646 - 671 (W)	2

(c)	any four from: MP1. not enough data points to make a valid conclusion; MP2. idea of testing a greater range of masses; MP3. idea of testing masses in between values; MP4. idea that there is a general (weak) positive correlation; MP5. idea that one of the data points could be anomalous; MP6. if first data point considered anomalous then there is a (weak) negative correlation; MP7. idea that final three data points suggest that power could be independent of mass; MP8. person with greatest mass does not have the greatest power;	ignore students are correct / incorrect allow idea that more students/readings are needed allow power increases with mass for the first two data points allow any named data point allow power decreases with increasing mass ignoring the first data point allow final three data points have approximately same power allow statement that 69kg person has the greatest power	4
-----	---	---	---

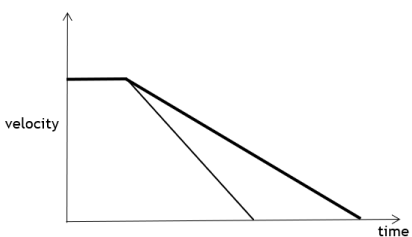
Total for Question 3 = 12 marks

Question number	Answer	Notes	Marks
4 (a)	substitution; evaluation; e.g. density = mass / volume density = 0.010 / 0.0056 density = 1.8 (kg/m ³)	Accept answer rounding to 1.8	2
(b)	idea that board of nails increases the area that force is being applied; pressure is less with board; (for a given force) pressure is inversely proportional to area; OR idea that force on each nail is less when using board of nails; pressure is less with board; (for a given area) pressure is proportional to force;	allow $p = F/A$ allow $p = F/A$	3

Total for Question 4 = 5 marks

Question number	Answer	Notes	Marks
5	any six marks in total: including no more than three marks from Jacket X, Jacket X / thick, black padded jacket MP1. idea that X reduces conduction considerably; MP2. jacket is a (good) insulator / poor conductor; MP3. idea that X reduces convection considerably; MP4. jacket traps (lots of) air MP5. black surface / jacket is a good emitter (of radiation) and including no more than three marks from Jacket Y. Jacket Y / thin, white jacket MP6. idea that Y does not reduce conduction considerably MP7. jacket is a poor insulator / good conductor MP8. Idea that Y does not reduce convection considerably MP9. does not trap much air MP10. white surface / jacket is a poor emitter (of radiation) General marks MP11. Air is a (good) insulator / poor conductor MP12. Trapped air cannot move around	Accept low/little/less conduction, Condone no conduction Accept low/little/less convection, Condone no convection Accept black surfaces emit (radiation) well. Accept black radiates well / more Accept lots of /more conduction Accept worse insulator /better conductor Accept lots of / more / allows convection Condone traps no air Ignore all references to absorbing/reflecting/taking in heat	6

Total for Question 5 = 6 marks

Question number	Answer	Notes	Marks
6 (a)	A (both braking and thinking distance increase); <i>B is incorrect as speed affects thinking distance</i> <i>C is incorrect as speed affects braking distance</i> <i>D is incorrect as speed affects both thinking and braking distance</i>		1
(b) (i)	horizontal line same as on original graph; diagonal line shallower than on graph to the x axis;  The graph shows velocity on the y-axis and time on the x-axis. A horizontal line starts at a positive velocity value and continues for a short duration. This is followed by a diagonal line that slopes downwards to the x-axis. The gradient of this diagonal line is shallower than the original diagonal line shown in the reference graph.	Accept curved line if all points of line shallower than graph line Accept a line that does not touch the x axis if it has reached the end of the x axis	2
(ii)	substitution into $KE = \frac{1}{2} \times m \times v^2$; rearrangement for v^2; rearrangement for v; evaluation; e.g. $6.3 \times 10^5 = 0.5 \times 7.5 \times 10^3 \times v^2$ $v^2 = 6.3 \times 10^5 / (0.5 \times 7.5 \times 10^3)$ $v = \sqrt{6.3 \times 10^5 / (0.5 \times 7.5 \times 10^3)}$ $v = 13 \text{ (m/s)}$	Ignore POT errors for MP1-3. MP2 and 3 can be done together for both marks Accept values that round to 13 (m/s)	4
(iii)	idea of (braking force does work) transferring (from the kinetic energy store) to the thermal energy store; the idea that the truck has no energy in its kinetic store when stopped;	Accept alternative answers in terms of energy transfers	2
(iv)	substitution and rearrangement; evaluation; e.g. $6.3 \times 10^5 = F \times 14$ $F = 6.3 \times 10^5 / 14$ $F = 45\,000 \text{ (N)}$		2

(v)	A (mechanically) <i>B is incorrect as the force is transferring the energy</i> <i>C is incorrect as the force is transferring the energy</i> <i>D is incorrect as the force is transferring the energy</i>		1
(c)	compares ratio's of speed and stopping distance for a set of 2 rows of data; compares ratio's of speed and stopping distance for a different set of 2 rows of data; (conclude that) the ratio's are not the same for each set, so speed and stopping distance are not directly proportional; OR compares stopping distance / speed for 2 rows of data; compares stopping distance / speed for a third row of data; (conclude that) results are different so speed and stopping distance are not directly proportional;	e.g. speed $20/10 = 2$, $45/14 = 3.2$ Accept 'no, because 20 is 2×10 (m/s), but 45 is not 2×14 (m)' for 2 marks DOP Accept two sets of data given where speed doubles but no calculation is shown, and statement that stopping distance has not doubled for 1 mark Accept: speed / stop distance or stop distance/speed e.g. $14/10 = 1.4$ $100/30 = 3.3$ DOP If no other marks scored: accept 'stopping distance does not go up in equal intervals' for 1 mark.	3

Total for Question 6 = 15 marks

