



Mark Scheme (Results)

November 2025

Pearson Edexcel International GCSE in Physics (Modular)
4WPH1/IP

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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.

Question number	Answer	Notes	Marks
1 (a)	any two from: if the current is too high; idea of isolating device; idea of no danger of overheating;	ignore comments relating to electric shock etc. allow current surge allow stops the current, breaks the circuit, cuts the power allow idea that it prevents fires	2
(b)	idea that fuse can't be reset; idea that fuse is slower (to break the circuit);	allow fuse has to be replaced ignore fuse melts/blows allow idea that fuse is less sensitive	2
(c)	any two from: in the event of a fault; current flows in earth wire; trips the circuit breaker;	allow description of a fault e.g. live wire touching metal case (of an appliance), drilling through a cable ignore comments relating to too much current etc. allow charge/electrons for current allow current goes to earth/ground allow idea that it provides low resistance path to earth allow idea that it prevents an electric shock	2

Total for Question 1 = 6 marks

Question number	Answer	Notes	Marks
2 (a)	substitution; evaluation to 3 s.f.; e.g. (work done =) 120×3.7 (work done =) 444 (J)		2
(b)	substitution OR rearrangement; evaluation; e.g. $12 = \text{mass} \times 10 \times 0.82$ OR $\text{mass} = \text{GPE} / [\text{g} \times \text{h}]$ (mass =) 1.5 (kg)	allow use of $g = 9.8, 9.81$ condone symbol for g being used in the substitution rather than the value allow 1.49...(kg) allow 1.46...(kg)	2
(c)	MP1. energy can't be destroyed; with any one of: MP2. energy transferred to thermal/heat store; MP3. energy transferred to surroundings; MP4. energy transferred due to friction;	allow statement that energy is conserved allow wasted / lost / dissipated for transferred ignore transferred to GPE, KE allow heat is transferred to surroundings	2

Total for Question 2 = 6 marks

Question number	Answer	Notes	Marks
3 (a)	MP1 same charges; MP2 (paint droplets) repel each other; MP3 producing an even coat of paint;	allow idea of ALL the paint droplets being positive allow idea that paint is attracted to the electrons in the car Ignore the idea that the paint droplets are repelled from the nozzle allow idea that paint finish is improved, allow idea that paint reaches parts that it wouldn't otherwise reach, allow idea that the paint covers a larger area Ignore thick layer of paint	3
(b)	MP1 car becomes charged when paint (particles) lands on it; MP2 further paint (particles) would be repelled by the car; MP3 idea of paint does not (continue to) reach car/metal	Allow the charge will build up on the car Allow 'metal' for 'car' Do not allow paint would not be attracted allow car gets thinner coat of paint Ignore paint won't stick	3
(c) (i)	ammeter;	Ignore 'ampmeter' allow 'ameter'	1
(ii)	conversion of mA to A; substitution into $Q = I \times t$; evaluation; e.g. 250 mA = 0.25 A $Q = 0.25 \times 320$ $Q = 80$ (C)	80 (C) to any other power of 10 scores 2 marks	3

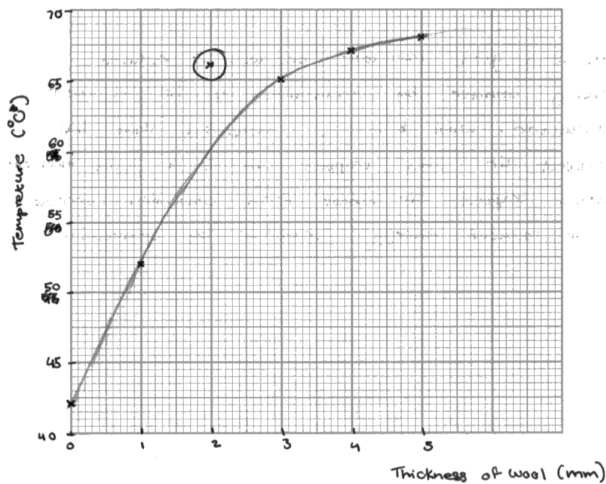
Total for Question 3: 10 marks

Question number	Answer	Notes	Marks
4 (a)	A (coal); <i>B is incorrect as it is renewable</i> <i>C is incorrect as it is renewable</i> <i>D is incorrect as it is renewable</i>		1
(b)	Any ONE advantage of oil from: MP1 idea that heat energy produced can change to meet demand; MP2 idea that it is reliable; Any ONE disadvantage of oil from: MP3 non-renewable; MP4 (burning oil) produces CO₂; MP5 dependent on supply; MP6 produces soot/particles that can damage lungs/affect breathing OR can produce carbon monoxide MP7 can cause water pollution Any ONE advantage of wind from: MP8 idea that it is renewable; MP9 does not contribute to global warming; Any ONE disadvantage of wind from: MP10 idea that wind is not always available; MP11 idea that wind turbines are noisy; MP12 idea that wind turbines interfere with bird migration;	Ignore 'carbon emissions' and reference to cost allow 'is always available', 'does not depend on the weather' allow 'does not run out' allow 'contributes to global warming' and 'produces greenhouse gases' Allow does not produce CO₂ and does not produce greenhouse gases it is not always windy, ignore it depends on the weather, unless qualified Do not accept kills birds Ignore comments on visual impact	4
(c) (i)	substitution into $\Delta Q = m \times c \times \Delta T$ rearrangement to find ΔT;	Substitution and rearrangement in any order.	5

	use of initial temperature = final temperature – ΔT; evaluation of initial temperature; significant figures; e.g. $19\,000\,000 = 120 \times 4200 \times \Delta T$ $\Delta T = 19\,000\,000 / (120 \times 4200)$ $\Delta T = 37.7\,^{\circ}\text{C}$ start temperature = $55 - 37.7$ start temperature = $17.3\,^{\circ}\text{C}$ start temperature = $17\,^{\circ}\text{C}$	Allow answer for ΔT from their substitution without seeing rearrangement. Condone wrongly/unconverted values for Q ecf from their value of ΔT, ignore issues with negative values, can be awarded for (55-Ti) in $\Delta Q = m \times c \times \Delta T$ 17.3 ($^{\circ}\text{C}$) scores 4 marks 38 ($^{\circ}\text{C}$) scores 3 marks 37.7 ($^{\circ}\text{C}$) scores 2 marks If no other marks scored then give 1 mark for correct conversion of energy	
(ii)	increased change in temperature; increased <u>energy</u> transfer needed;	Accept bigger temperature difference Ignore more heat is lost to surroundings Ignore it needs more heat,	2

Total for Question 4: 12 marks

Question number	Answer	Notes	Marks
5 (a)	MP1 Take measurements for different thicknesses of the wool; AND any two measuring instruments from: MP2 (measure temperature with) a thermometer; MP3 (measure time with) stop watch / stop clock / timer; MP4 (measure volume with) a measuring cylinder; MP5 (measure thickness of material with) a ruler; AND Any two technique for accuracy from: MP6 stir the water (to keep temperature constant throughout); MP7 put a lid on it (to reduce convection); MP8 repeat readings and calculate a mean; MP9 read thermometer perpendicular to scale AND any one control variables from: MP10 volume of water; MP11 starting temperature of the water;	Allow temperature probe Allow vernier callipers, micrometer Accept read thermometer at eye level Condone amount of water	6
5 (b) (i)	suitably labelled axes including units; suitable linear scale; data plotted correctly;	axes can be reversed plots cover at least half of the grid + / - half a small square	3
(ii)	plot at 2mm circled		1
(iii)	curved line of best fit;		1

	<table><tr><th>Thickness of insulation in mm</th><th>Final temperature in °C</th></tr><tr><td>0.0</td><td>42</td></tr><tr><td>1.0</td><td>52</td></tr><tr><td>2.0</td><td>66</td></tr><tr><td>3.0</td><td>65</td></tr><tr><td>4.0</td><td>67</td></tr><tr><td>5.0</td><td>68</td></tr></table> Temperature (°C)  Thickness of wool (mm) temperature in range 68 - 75 °C	Thickness of insulation in mm	Final temperature in °C	0.0	42	1.0	52	2.0	66	3.0	65	4.0	67	5.0	68		1
Thickness of insulation in mm	Final temperature in °C																
0.0	42																
1.0	52																
2.0	66																
3.0	65																
4.0	67																
5.0	68																
(c)	MP1 wool/air is a good insulator / poor conductor; MP2 wool/air reduces (energy transfer by) conduction MP3 trapped air cannot move around; MP4 trapped air reduces convection;	ACCEPT ORA Accept wool/air stops conduction Accept trapped air stops convection	4														

Total for Question 5: 16 marks

Question number	Answer	Notes	Marks
6 (a)	correct symbol; symbol in parallel with resistor R;	must be a V inside a circle e.g. $\textcircled{V}$ allow an incorrect symbol for the voltmeter for this mark, but must be identifiable/labelled as a voltmeter	2
(b) (i)	voltage = current $\times$ resistance;	allow standard symbols and rearrangements e.g. $I = V \div R$ condone lower case symbols ignore c, C for current	1
(ii)	substitution; rearrangement; evaluation in milliamps; e.g. $1.9 = \text{current} \times 800$ OR $I = V \div R$ current = $1.9 \div 800$ current = 2.4 (mA)	mark independently answer of 0.002375, 0.00238, 0.00237, 0.0024 scores 2 marks allow 2.375, 2.38 (mA) condone 2.37 (mA)	3
(c)	MP1. resistance (of LDR / circuit) decreases (with increased brightness); MP2. current increases; MP3. voltage of fixed resistor increases; MP4. battery/total voltage remains constant (so voltage across LDR decreases); OR MP1. resistance of LDR decreases (with increased brightness); MP2. LDR resistance is a smaller proportion/fraction of total resistance; MP3. voltage from battery is split/shared between LDR and resistor; MP4. (so) voltage (across LDR) is <u>proportional</u> to resistance (so voltage across LDR decreases);	allow R, resistor R for fixed resistor allow circuit voltage for total voltage ignore quotation of $V=I \times R$	4
(d)	any two from: MP1. current increases; MP2. increase in number of paths/branches; MP3. resistance (of parallel combination) is lower;		2

Total for Question 6 = 12 marks

Question number	Answer	Notes	Marks
7 (a)	D (gradient of the line); <i>A is incorrect because this gives the distance travelled</i> <i>B is incorrect because axes are a feature of all graphs not connected with acceleration</i> <i>C is incorrect because not all graphs have curves</i>		1
(b)	B (Q); <i>A (P) is incorrect as the car is still increasing in velocity</i> <i>C (R) is incorrect as the car has been decelerating for some time</i> <i>D (S) is incorrect as the car has stopped moving</i>		1
(c)	any two from: MP1. air resistance increases (with increasing speed); MP2. resultant force decreases; MP3. acceleration decreases; MP4. gradient decreases;	allow drag/friction for air resistance allow velocity increases at decreasing rate ignore accelerates at decreasing rate condone slope decreases	2
(d)	idea that distance = area (under line); attempt at calculating area of correct triangle; correct evaluation; e.g. distance = area distance = $0.5 \times 90 \times 4.0$ (distance =) 180 (m)	allow statement that distance = average speed $\times$ time condone misreading speed for this mark e.g. using speed = 85, 88 must be 180 (m) no ECF from use of speed = 85, 88 allow alternative valid methods e.g. using $v^2 = u^2 + 2as$ with calculated acceleration	3

Total for Question 7 = 7 marks

Question number	Answer	Notes	Marks
8 (a)	A (elastic); <i>B is incorrect as a spring stores elastic energy</i> <i>C is incorrect as a spring stores elastic energy</i> <i>D is incorrect as a spring stores elastic energy</i>		1
(b) (i)	substitution; rearrangement; evaluation; e.g. $0.32 = 0.068 \times a$ $a = 0.32 / 0.068$ $a = 4.7 \text{ (m/s}^2\text{)}$	Allow POT error for substitution and rearrangement Accept 4.71, 4.70....	3
(ii)	D (0.45 N) <i>A is incorrect as this is the frictional force</i> <i>B is incorrect as this is the resultant force - the frictional force</i> <i>C is incorrect as this is the resultant force</i>		1
(iii)	substitution into $KE = \frac{1}{2} \times m \times v^2$; evaluation of a kinetic energy; evaluation of kinetic energy gained; e.g. $KE_{\text{initial}} = \frac{1}{2} \times 0.068 \times 1.1^2$ $KE_{\text{initial}} = 0.041 \text{ (J)}$ $KE_{\text{final}} = \frac{1}{2} \times 0.068 \times 2.6^2$ $KE_{\text{final}} = 0.23 \text{ (J)}$ $KE_{\text{gained}} = 0.23 - 0.041 = 0.19 \text{ (J)}$	Allow use of $v = 1.5$ for this mark only, allow use of wrongly converted mass for this mark only Allow 0.041, 0.041... or 0.23, 0.230 or 0.2298.... Allow use of $KE = \frac{1}{2} \times m \times (v^2 - v^2)$ for MP1 and 2, Allow numbers that round to 0.19 (J)	3

Total for Question 8: 8 marks

Question number	Answer	Notes	Marks
9 (a)	substitution OR correct choice of area dimensions; rearrangement; evaluation; e.g. $\text{area} = 0.19 \times 0.11 = 0.0209$ $1200 = \text{weight} / 0.0209$ $\text{weight} = 1200 \times 0.0209$ $\text{weight} = 25 \text{ (N)}$	Area as $(0.19 \times 0.07 = 0.0126)$ or $(0.07 \times 0.11 = 0.0077)$ gets substitution mark but not rearrangement, ignore POT errors for substitution and rearrangement marks accept 25.1, 25.08 25, 25.1, 25.08 to any other POT gains 2 marks	3
(b)	area in contact with ground decreases; (force/weight is unchanged) so pressure increases;	ORA Accept area is small ORA DOP	2

Total for Question 9: 5 marks

Question number	Answer	Notes	Marks
10 (a)	EITHER measure length of track using tape measure / ruler; measure time using a stop clock / stop watch / timer; (average speed =) distance / time; OR measure distance between light gates using a tape measure / ruler; measure time using two light gates; (average speed =) distance / time;	Accept measure length of track using a trundle wheel Accept plot graph of distance against time and find the gradient Allow sensible symbols, e.g. $s = d/t$, $u = s/t$, Accept measure distance between using a trundle wheel Accept plot graph of distance against time and find the gradient Allow sensible symbols, e.g. $s = d/t$, $u = s/t$,	3
(b)	substitution; evaluation; e.g. momentum = 41×5.6 momentum = 230 (kg m/s)	allow 229.6 (kg m/s)	2
(c)	(the mat) increases impact time; (for) same change in momentum; Or decreasing deceleration; reduces force (on the child);	Allow reference to force = change in momentum / time allow reference to rate of change of momentum Ignore absorbs force/impact	3

Total for Question 10: 8 marks