Pearson Edexcel

Mark Scheme (Results)

Summer 2025

Pearson Edexcel GCSE
In Physics (1PH0)
Paper 2F

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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.

Physics 1PH0_2F

Question Number	Answer	Additional guidance	Mark
1 (a) (i)	24 (Ω)		**(1)** **AO1.2**

Question Number	Answer	Additional guidance	Mark
1 (a) (ii)	substitution (1) (V=) 0.50 x 12 evaluation (1) 6.0 (V)	 accept 6 award full marks for the correct answer without working	**(2)** **AO2.1**

Question Number	Answer	Additional guidance	Mark
1 (a)(iii)	time converted to s (1) 300 (s) substitution (1) (E=) 0.4 x 4.5 x 5 (x60) evaluation (1) 540 (J)	 accept 5 x 60 seen 0.4 x 4.5 x 300 scores first 2 marks 9 (J) scores 2 marks (no conversion to seconds) 540 to any other power of ten scores 2 marks award full marks for the correct answer without working	**(3)** **AO2.1**

Question Number	Answer	Mark
1(b)(i)	**B** the ammeters measure the current in the circuit **A** is incorrect because the switch is in the closed position not open **C** is incorrect because the resistors are fixed resistors not variable **D** is incorrect because the circuit does not have an a.c. power supply the supply is a cell which is d.c.	**(1)** **AO1.1**

Question Number	Answer	Additional guidance	Mark
1(b)(ii)	(current in the circuit) decreases (1)	accept reduces/gets smaller/is less/goes down ignore slows down (the current)	**(1)** **AO1.1**

Total for Question 1 = 8 marks

Question Number	Answer	Mark
2(a)	**A** gravitational **B,C** and **D** are incorrect because the only force that keeps the Moon in orbit around the Earth is gravitational	**(1)** **AO1.1**

Question Number	Answer	Additional guidance	Mark
2(b)(i)	substitution (1) 375 x 1.4 evaluation (1) 525 (Nm)	 525 to any other power of 10 scores 1 mark award full marks for the correct answer without working	**(2)** **A02.1**

Question Number	Answer	Additional guidance	Mark
2(b)(ii)	an explanation linking: the distance (from the pivot) is increased (1) increasing the moment/turning effect of the force (1)	 accept further away accept (makes it) easier to turn / lift accept less force / effort (to move)	**(2)** **AO2.2**

Question Number	Answer	Additional guidance	Mark
2 (c)	anticlockwise moment (1) 4 x 20 = 80 (N cm) **OR** substitution (1) X x 40 = 4 x 20 evaluation (1) X = 2.0 (N)	accept 4 x 0.2 = 0.8 (N m) accept 4 x 2 = 8 (ratio idea) accept rearranged X= 4 x 20 / 40 accept X x 0.40 = 4 x 0.20 accept X x 4 = 4 x 2 accept 2 (N) award full marks for the correct answer without working	**(2)** **AO2.1** **AO2.2**

Total for Question 2 = 7 mark

Question Number	Answer	Mark
3(a)	**A** the highest point in the can **B, C** and **D** are incorrect because they are lower in the can and more pressure is exerted	**(1)** **AO1.1**

Question Number	Answer	Additional guidance	Mark
3(b)(i)	use (1) 12 x 25 evaluate (1) 300 (cm^2)	300 to any other power of ten scores 1 mark award full marks for the correct answer without working	**(2)** **AO2.1**

Question Number	Answer	Additional guidance	Mark
3b(ii)	(use paper with) smaller divisions/squares (1)	accept suggested square area less than $25cm^2$ accept use larger paper (so the shoe fits easier) ignore repeating	**(1)** **AO3b**

Question Number	Answer	Additional guidance	Mark
3 (b)(iii)	substitution (1) (P =) $\frac{680}{0.031}$ evaluation (1) 22 000 (Pa) **OR** substitution (1) (P =) $\frac{680}{0.062}$ evaluation (1) 11 000 (Pa) unit (1) Pa **OR** N/m^2 **OR** Pascal	 accept any answer that rounds to 22 000 or 2.2×10^4 power of ten error scores 1 mark accept any answer that rounds to 11 000 or 1.1×10^4 power of ten error scores 1 mark award first 2 marks for the correct answer without working independent mark do not accept Nm^2 do not accept n for N accept for 3 marks: 22 kPa **OR** 11 kPa **OR** 2.2 N/cm^2 **OR** 1.1 N/cm^2	**(3)** **AO2.1** **AO1.1**

Question Number	Answer	Additional guidance	Mark
3 (c)	an explanation linking: (snowshoes have a) large(r) (surface) **area** (than boots) (1) reduces the pressure (on the snow) (1)	accept reverse argument throughout accept do not sink into snow/ stay on top of the snow	**(2)** **AO2.2**

Total for Question 3= 9 marks

Question Number	Answer	Mark
4(a)	**A** particles move around and are very close together **B** is incorrect because describes particles in a gas **C** is incorrect because does not describe solid, liquid or gas as the particles always move **D** is incorrect because describe particles in a solid	**(1)** **AO1.1**

Question Number	Answer	Additional guidance	Mark
4(b)	a description including: use the **balance** to find the **mass** of the key (1) (add water and) measure (initial) volume / level of water using the (measuring) cylinder (1) place the key in the measuring cylinder (1) subtract the (two) volumes (to give the volume of the key) (1)	 accept weigh the key using the **balance** allow scales for balance ignore weight accept fill measuring cylinder to a named volume e.g. 100ml accept find the increase/ difference in volume / level of water allow alternative method: use the **balance** to find the **mass** of the key (1) **fill** beaker/eureka can (to the top) with water (1) place key in beaker/eureka can and catch overflow (in measuring cylinder) (1) measure volume / level of water using the (measuring) cylinder (1)	**(4)** **AO1.2**

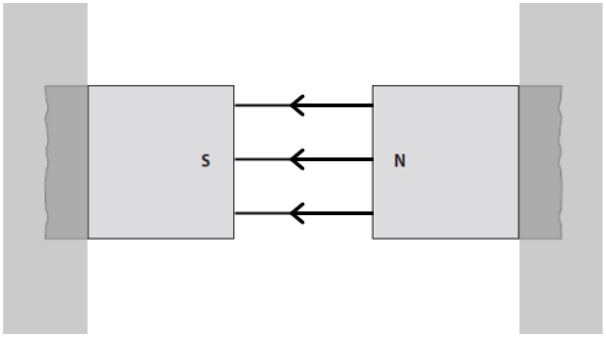
Question Number	Answer	Additional guidance	Mark
4(c)(i)	substitution (1) (ΔQ =) 0.96 x 920 x 17 evaluation (1) 15000 (J)	0.96 x 920 x (35-18) accept 15014 (.4) 15000 to any other power of ten scores 1 mark award full marks for the correct answer without working	**(2)** **AO2.1**

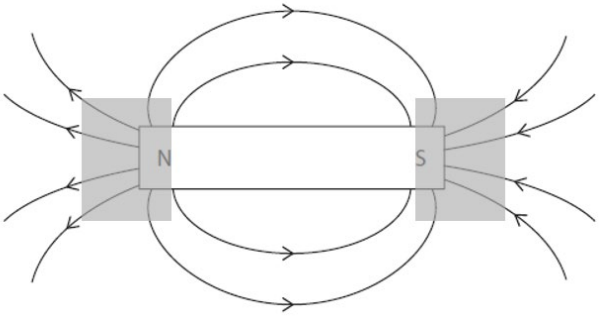
Question Number	Answer	Additional guidance	Mark
4(c)(ii)	add insulation (around aluminium block) (1)	accept any named insulator allow polish aluminium block allow wrap in foil or put in a box ignore 'lids' unless with a (named) insulator	**(1)** **AO3b**

Question Number	Answer	Additional guidance	Mark
4(c)(iii)	any **one** from: energy needs (time) to transfer (through the aluminium) (1) heater and thermometer are not close together (1) there is a gap between the thermometer and the block (1)	accept heat for energy accept travel/conduct/spread for transfer	**(1)** **AO1.1**

Total for Question 4 = 9 marks

Question Number	Answer	Mark
5(a)	**C** steel **A, B** and **D** are incorrect because they are non-magnetic	**(1)** **AO1.1**

Question Number	Answer	Additional guidance	Mark
5(b)	 at least three straight lines between N and S poles (equally spaced) (1) **all** drawn arrows on lines are from N to S (1)	ignore drawn lines which start inside the shaded regions judge by eye lines do not have to touch magnets ignore lines drawn above or below magnets / edge effects for this mark	**(2)** **AO2.2**

Question Number	Answer	Additional guidance	Mark
5(c)(i)	X drawn in either of the shaded regions (1)  		**(1)** **AO1.1**

Question Number	Answer	Additional guidance	Mark
5(c)(ii)	the (magnetic) **field** is strongest (1) (because the field) lines are close(r) together (1)	accept strongest (magnetic) **force** allow more lines	**(2)** **AO3.2a/2b**

Question Number	Answer	Additional guidance	Mark
5(d)(i)	an explanation linking: (the compass needle) always points in the same direction (1) (because) the Earth's magnetic field exerts a force (on the needle) (1)	accept points north / south ignore aligns with Earth's magnetic field do not accept (always) points towards core accept attracted to (magnetic) pole	**(2)** **AO2.2**

Question Number	Answer	Additional guidance	Mark
5(d)(ii)	any **one** from: motor/generator/ loudspeaker/ microphone / (plotting) compass	accept any named device containing a permanent magnet e.g. door closer / fridge magnet / phone / any device with an electric motor / MRI ignore (bar) magnet	**(1)** **AO2.1**

Total for Question 5 = 9 marks

Question Number	Answer	Mark
6(a)	**B** squashing a piece of modelling clay **A** ,**C** and **D** are incorrect because all return to original shape when the force is removed. The distortion is elastic.	**(1)** **AO1.1**

Question Number	Answer	Additional guidance	Mark
6(b)(i)	a description including any **four** of the following: measure **initial** d / distance / height (1) change weight (1) measure **new** d / distance / height (1) repeat / continue (changing weight and measuring d) (1) plot a graph (d against weight) (1)	accept reference to 16 (mm)	**(4)** **AO3a** **AO 3.2a/2b**

Question Number	Answer	Additional guidance	Mark
6(b)(ii)	any **one** from: distance between the clamp and the masses (1) (change) strip (1)	accept ruler for strip throughout accept length of the strip accept thicker strip /thinner strip / material of strip / strip of different density etc.	**(1)** **AO3.3b**

Question Number	Answer	Additional guidance	Mark
6(c)(i)	substitution (1) (k =) $\frac{2}{6.2 (\times 10^{-2})}$ evaluation (1) 32 (N/m)	 accept answers which round to 32 32 to any other power of ten scores 1 mark award full marks for the correct answer without working ignore 3.1 (from 6.2/2)	**(2)** **AO2.2**

Question Number	Answer	Additional guidance	Mark
6(c)(ii)	substitution (1) (E =) $0.5 \times 25 \times 0.06^2$ evaluation (1) 0.045 (J)	 accept 0.05 (J) 0.045 to any other power of ten scores 1 mark award full marks for the correct answer without working	**(2)** **AO 2.1**

Total for Question 6 = 10 marks

Question Number	Answer	Additional guidance	Mark
7(a)(i)	**B** 70 kPa **A** is incorrect because it is the atmospheric pressure at a height of about 2000m above the Earth **C** is incorrect because it is the atmospheric pressure at a height of 4000m above the Earth's surface **D** is incorrect because it is the atmospheric pressure at a height of about 5500m above the surface of the Earth		**(1)** **AO3.2b**

Question Number		Additional guidance	Mark
7a(ii)	a description including: the atmospheric pressure deceases as the height above the surface of the Earth increases (1) idea of non-linear (relationship) (1)	 accept reverse argument Ignore negative correlation accept exponential accept inversely proportional ignore indirectly proportional ignore curved	**(2)** **AO2.2**

Question Number	Answer	Additional guidance	Mark
7(b)(i)	substitution (1) $(V_2 =)\ \frac{15 \times 2.3}{0.35}$ evaluation (1) 99 (litres)	 accept any value rounding to 99 99 to any other power of ten scores 1 mark award full marks for the correct answer with no working accept alternative method to calculate a different variable e.g. substitution (1) $P_2 = \frac{15 \times 2.3}{100}$ Evaluation (1) $(P_2 =)$ 0.345	**(2)** **AO2.1**

Question Number	Answer	Additional guidance	Mark
7(b)(ii)	evaluation (1) $\left(\frac{100}{6}\right) = 16.7\ (mins)$	 accept any value between 16 and 17 (mins) award the mark for the correct answer with no working	**(1)** **AO2.1**

Question Number	Answer	Additional guidance	Mark
7(b)(iii)	any **one** from: reduce the amount of oxygen per minute / flow rate (to patient) (1) use a larger (capacity) cylinder (1) use a new cylinder when this one is empty (1)	 must relate to time or rate for this marking point accept reduce the pressure (of oxygen released) accept use hospital mains supply (of oxygen) accept use multiple cylinders	**(1)** **AO2.2**

Question number	Indicative content	Mark
***7(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. AO2.1/ AO3 **How volume and pressure change** • the weights on the piston compress the gas (by applying a force) • larger weight causes the volume to decrease • pressure increases when the volume decreases • (in a smaller volume) particles collide more frequently (with surface)	(**6**) **AO2.2, AO3.3a**

	• (more frequent collisions) causes a gas particles to exert a greater force (on container) • P=F/A **How particles exert force** • gas particles collide with piston (sides of container) • there is a change in momentum of the gas particles • force equals rate of change of momentum • force is exerted over an area causing pressure • force exerted by weight is balanced by force exerted by gas	

Level	Mark	Descriptor
	0	• No awardable content
Level 1	1–2	• Interpretation and evaluation of the information attempted but will be limited with a focus on mainly just one variable (AO3) • The explanation attempts to link and apply knowledge and understanding to scientific ideas, flawed or simplistic connections made between elements in the context of the question.(A02)
Level 2	3–4	• Interpretation and evaluation of the information on both variables synthesises mostly relevant understanding (AO3) • The explanation is mostly supported through linkage and application of knowledge and understanding of scientific ideas some logical connections made between elements in the context of the question(AO2)
Level 3	5–6	• Interpretation and evaluation of the information, demonstrating throughout the skills of synthesising relevant understanding (AO3) • Then explanation is supported is supported throughout by linkage and application of knowledge and understanding of scientific ideas some logical connections made between elements in the context of the question (AO2)

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	Additional guidance Isolated fact about volume, pressure, movement of gas particles	Possible candidate responses smaller volume (of gas) pressure is increased gas particles collide
Level 2	3–4	Additional guidance Limited explanation linking weight/force with pressure and volume OR linking movement of gas particles/ collisions (with walls) to force exerted by gas	Possible candidate responses the volume gets smaller, and the pressure goes up OR gas particles collide causing a force gas particles have more frequent collisions
Level 3	5–6	Additional guidance Detailed explanation that includes linking weight/force with pressure and volume and linking collisions to force or frequency of collisions	Possible candidate responses a larger weight gives a greater pressure and a smaller volume, the gas particles exert a force through collisions in Y, the volume is smaller, and the pressure is bigger and the particles have more frequent collisions

Total for Question 7 = 13 marks

Question Number	Answer	Additional guidance	Mark
8(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. Δgpe = 10 x 0.26 x 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 Δgpe = 10 x 26 x 1.6 allow 26 to any power of 10 for this mark OR height converted to m 0.26 (m) or 26 x 10^{-2} (m)	**(2)** **AO 2.1**

Question Number	Answer	Additional guidance	Mark
8(a)(ii)	substitution (1) (v^2=) $\frac{2x\ 4.1}{1.6}$ 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
8(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
8(b)(i)	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**

Question Number	Answer	Additional guidance	Mark
8(b)(ii)	an answer linking: measure the height of a step (1) multiply by number of steps (1)	 accept add all step heights together	**(2)** **AO2.2**

Total for Question 8 = 11 marks

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

Question Number	Answer	Additional guidance	Mark
9(b)	substitution (1) (P=) 0.53 x 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
9(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
9(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)** **AO2.2**

Question Number	Answer	Additional guidance	Mark
9(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)** **AO1.1**

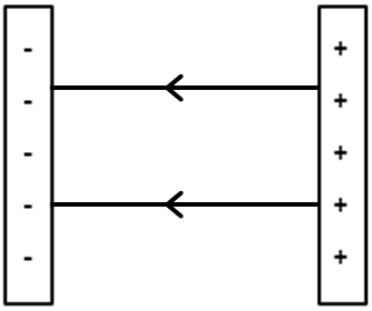
Question number	Indicative content	Mark
***9(d)**	Answers will be credited according to candidate's deployment of knowledge and understanding of the material in relation to the qualities and skills outlined in the generic mark scheme. The indicative content below is not prescriptive and candidates are not required to include all the material which is indicated as relevant. Additional content included in the response must be scientific and relevant. AO1 / AO3 **Distribution** • voltage at power station higher than in homes • transformers change voltages • electrical energy is transferred on overhead power lines • overhead power lines are at 132 kV **Action of transformers** • step-up transformers convert 25 kV to 132 kV • step-up transformers reduce the current	(**6**) **AO1.1 AO3.3a**

	• step down transformers convert high voltages of power lines to 230 V for use in homes • low voltage is safer for use in homes **Efficiency** • transformers make the distribution of electricity more efficient • high currents cause heating effect • dissipation of thermal energy/heat to the atmosphere • increasing the voltage/ reducing the current in the overhead power lines reduces energy / heat loss	

Level	Mark	Descriptor
	0	• No awardable content
Level 1	1–2	• Interpretation and evaluation of the information attempted but will be limited with a focus on mainly just one variable (AO3) • Presents an explanation with some structure and coherence (AO1)
Level 2	3–4	• Interpretation and evaluation of the information on both variables synthesises mostly relevant understanding (AO3) • Presents an explanation that has structure, which is mostly clear coherent and logical.(AO1)
Level 3	5–6	• Interpretation and evaluation of the information, demonstrating throughout the skills of synthesising relevant understanding (AO3) • Presents an explanation 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	Additional guidance Isolated facts about power distribution at any point.	Possible candidate responses power lines are at 132000V homes get electricity at 230V transformers change voltages improves efficiency
Level 2	3–4	Additional guidance Limited explanation giving link between voltage change and type of transformer OR link between high voltage and power lines and energy loss OR link between current and transformer / energy loss	Possible candidate responses the step-up transformer increases the voltage the step-down transformer changes the voltage from 132000 V to 230V A is a step-up transformer and B is a step-down transformer the high voltage in overhead power lines reduces heat losses it is more efficient because the power lines are at a high voltage transformers can reduce current low current means less energy loss
Level 3	5–6	Additional guidance Detailed explanation linking role of transformer WITH current decrease to reduce energy loss	Possible candidate responses transformer A decreases the current to reduce heat loss

Total for Question 9 = 13 marks

Question number	Answer	Additional guidance	Mark
10(a)	at least two horizontal straight lines between the two plates, judge by eye (1) arrows **only** from +ve towards -ve (1)	independent marks lines do not have to touch plates ignore curved lines at top and bottom of plate(s) example, scores 2 marks 	**(2)** **AO1**

Question number	Answer	Additional guidance	Mark
10(b)(i)	D gained electrons A and C are incorrect because protons are not exchanged in this context B is incorrect because it would give the particles a net positive charge		**(1)** **AO1**

Question number	Answer	Additional guidance	Mark
10(b)(ii)	an explanation linking any **two** from (soot particles are in an) electric field (1) **AND EITHER** attraction (1) (surface of) it/tube has (induced) positive/opposite/unlike charge (1) **OR** repulsion (1) rod (and soot particles) has a negative/like/same charge (1)		**(2)** **AO1**

Question number	Answer	Additional guidance	Mark
10(b)(iii)	(net charge) becomes zero (1)	discharged / charge is lost / charge moves on to the metal tube/ becomes neutral allow electrons for charge ignore becomes positively charged	**(1)** **(AO1)**

Question number	Answer	Additional guidance	Mark
10(b)(iv)	an explanation linking metal is a conductor (1) (connected to) earth/ground (1)	allow electrons for charge charge moves through the metal / tube / wire	**(2)** **AO1**

Question number	Answer	Additional guidance	Mark
10(c)	substitution into Q = I x t (1) (Q =) 2.5 (x 10^{-3}) x 80 evaluation (1) (Q =) 0.2 unit (1) coulombs OR C OR As	 allow 0.2 to any other power of ten for 1 mark award first two marks for correct answer without working independent mark allow c award 3 marks for 200 mC OR 200 mAs award 2 marks for 200 C OR 200 As	**(3)** **AO2**

Total for Question 10 = 11 marks

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