Question Number	Answer	Acceptable answers	Mark
14(a)	energy transferred per second		**(1)**

Question Number	Answer	Acceptable answers	Mark
1(b)(i)	substitution (1) 0.25 x 230 evaluation (1) 58 (W)	 accept 57 to 58, and 60 (W) give full marks for correct answer, no working	 **(2)**

Question Number	Answer	Acceptable answers	Mark
1(b)(ii)	A description including the following points • (rate) of flow (1) • (of) charge (1)	 per second/flows/flowing electrons/ions/coulombs/C IGNORE electricity/amps/A	 **(2)**

Question Number	Answer	Acceptable answers	Mark
1(c)(i)	(current) it is reduced	gets smaller/ decreases/ slows down/ drops/ lower	**(1)**

Question Number	Answer	Acceptable answers	Mark
1(c)(ii)	conversion of watts to kilowatts (1) substitution (1) 0.0005 x 48 x 26 evaluation (1) 0.62(4)(p) Note: 0.0005 x 48 x 26 scores 2 (conversion and substitution marks)	This is a 'show that' so marks are only awarded if working is shown. For no conversion of power but otherwise correct, 0.5 x 48 x 26 (1) 624 (p) (1) Any other power of ten error in power or cost seen in substitution 1 mark maximum Answers with no working get zero marks.	**(3)**

Question Number	Answer	Acceptable answers	Mark
1(c)(iii)	Any **one** of the following points • ideas of energy conservation (1) • ideas of **atmospheric** polluting effects (1) • ideas of possible dangers (1) • reduces life of parts (TV) (1)	wastes energy (if left on) RA (NOT wastes electricity) CO_2 / SO_2 production/global warming/acid rain/greenhouse gases fire hazards/overheating /safer(when off) Ignore ozone layer references	**(1)**

Question Number	Answer	Acceptable answers	Mark
2(a)(i)	positive / + /plus /+ve /positively (charged)	accept poor spelling of positive	**(1)**

Question Number	Answer	Acceptable answers	Mark
2(a)(ii)	An explanation linking **two** from the following points • repulsion / repels (1) • (because) same charge (1) • (force) greater than gravity (1)	independent mark positive charges repel each other (2) both positive so repel(2) positive ball attracted to negative lid (2)	**(2)**

Question Number	Answer	Acceptable answers	Mark
2(b)	An explanation linking the following points • electrons move (1) • from ground to lid (1)	negative charge moves to neutralise positives	**(2)**

Question Number	Answer	Acceptable answers	Mark
2(c)	An explanation linking the following points • discharged /earthed so falls(1) • charged again/at plate so rises/repels (1)	pulled down by gravity reached the plate and process repeats ignore direction of charge flow – already assessed	**(2)**

Question Number	Answer	Acceptable answers	Mark
2(d)	**B**		**(1)**

Question Number	Answer	Acceptable answers	Mark
3 (ai)	Substitution (1) 1.5 x 6 Evaluation (1) 9 (W) Ignore any unit given by candidate.	Power of 10 error max 1 mark Give full marks for correct answer with no working shown	**(2)**

Question Number	Answer	Acceptable answers	Mark
3 (aii)	• More turns on the coil (1) • More powerful/stronger magnet(s) (1)	Wrap coils on iron (core/former)/ more coils/twists/loops. Bigger coil is insufficient. More magnets. Bigger/larger magnet is insufficient. Ignore increase speed of rotation	**(2)**

Question Number	Answer	Acceptable answers	Mark
3 (aiii)	A description including • in one direction only for DC (1) • reversing direction for AC (1)	 'DC goes straight' is insufficient AC switches/changes direction OR moves to and fro 'AC goes different ways' is insufficient. Diagram with labelled arrows could get 2 marks.	**(2)**

Question Number		Indicative Content	Mark
QWC	***3(b)**	A comparison including some of the following ideas • Transformers can be used or {voltages/currents} can be {changed/transformed} • AC (can transmit) at lower current/high(er) voltage • National Grid is (usually) over ground (DC cables (were) underground) • Less energy lost in transmission • National Grid system can supply to customers further away • Possible to create a grid linking power stations • More flexibility in voltage for consumer • Consumer can draw large(r) current • More flexibility in power drawn • Great(er) range of devices can be powered Ignore methods of electricity production	**(6)** **Exp**
Level	**0**	No rewardable content	
1	**1 - 2**	• a limited (maybe implied) comparison giving one fact e.g: AC can be at high(er) voltage OR the National Grid can supply houses not close to a power station/ further (away/than the New York system.) • the answer communicates ideas using simple language and uses limited scientific terminology • spelling, punctuation and grammar are used with limited accuracy	
2	**3 - 4**	• a simple comparison including two ideas which may be linked or not eg Nat. Grid can supply whole country and can be used for more appliances (than just lighting). e.g: AC can be transmitted further (than DC) (because it) wastes less energy • the answer communicates ideas showing some evidence of clarity and organisation and uses scientific terminology appropriately • spelling, punctuation and grammar are used with some accuracy	
3	**5 - 6**	• A detailed comparison including at least three ideas, with at least one direct link between two of them. • e.g. AC can be transmitted further (than DC) because AC can be transformed to {lower current/high(er) voltages}. OR AC can be transformed to {lower current/high(er) voltages}. Greater range of devices used. • the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately • spelling, punctuation and grammar are used with few errors	

Total for Question 6 = 12 mark

Question Number	Answer	Acceptable answers	Mark
4(a)(i)	C		**(1)**

Question Number	Answer	Acceptable answers	Mark
4(a)(ii)	B		**(1)**

Question Number	Answer	Acceptable answers	Mark
4(b)	substitution (1) 3.7 x 13 evaluation (1) 48 (C)	48.1 Correct answer with no calculation scores 2 marks	**(2)**

Question Number	Answer	Acceptable answers	Mark
4(c)(i)	Correct responses can be seen in (i) r (ii) An explanation linking • <u>electrons</u> (1) and <u>one</u> of • removed by friction (1) • (transferred) <u>to</u> plastic (1)	["positive electrons/ protons moving", seen anywhere in part (i) or (ii) loses this mark] ignore reference to charge before rubbing transferred from cloth	**(2)**

Question Number	Answer	Acceptable answers	Mark
4(c)(ii)	opposite to charge on plastic (1) <u>equal</u> to charge on the plastic (1)	charge on cloth is positive <u>same size</u> as charge on plastic electrons transferred from the cloth equal to electrons lost by cloth	**(2)**

Total question 1 = 8 marks