

Question Number	Answer	Acceptable answers	Mark
<b>11(a)</b>	energy transferred per second		<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>1(b)(i)</b>	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	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>1(b)(ii)</b>	A description including the following points <ul style="list-style-type: none"> <li>• (rate) of flow (1)</li> <li>• (of) charge (1)</li> </ul>	per second/flows/flowing  electrons/ions/coulombs/C  IGNORE electricity/amps/A	<b>(2)</b>

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

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

Question Number	Answer	Acceptable answers	Mark
<b>1 (c) (iii)</b>	<p>Any <b>one</b> of the following points</p> <ul style="list-style-type: none"> <li>• ideas of energy conservation (1)</li> <li>• ideas of <b>atmospheric</b> polluting effects (1)</li> <li>• ideas of possible dangers (1)</li> <li>• reduces life of parts (TV) (1)</li> </ul>	<p>wastes energy (if left on) RA (NOT wastes electricity)</p> <p>CO<sub>2</sub> / SO<sub>2</sub> production/global warming/acid rain/greenhouse gases</p> <p>fire hazards/overheating /safer(when off)</p> <p>Ignore ozone layer references</p>	<b>(1)</b>

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

Question Number	Answer	Acceptable answers	Mark
<b>2(a)(ii)</b>	An explanation linking <b>two</b> from the following points <ul style="list-style-type: none"> <li>• repulsion / repels (1)</li> <li>• (because) same charge (1)</li> <li>• (force) greater than gravity (1)</li> </ul>	independent mark  positive charges repel each other (2) both positive so repel(2)  positive ball attracted to negative lid (2)	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>2(b)</b>	An explanation linking the following points <ul style="list-style-type: none"> <li>• electrons move (1)</li> <li>• from ground to lid (1)</li> </ul>	negative charge moves  to neutralise positives	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>2(c)</b>	An explanation linking the following points <ul style="list-style-type: none"> <li>• discharged /earthed so falls(1)</li> <li>• charged again/at plate so rises/repels (1)</li> </ul>	pulled down by gravity  reached the plate and process repeats  ignore direction of charge flow – already assessed	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>2(d)</b>	<b>B</b>		<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>3 (ai)</b>	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	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>3 (aii)</b>	<ul style="list-style-type: none"> <li>• More turns on the coil (1)</li> <li>• More powerful/stronger magnet(s) (1)</li> </ul>	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	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>3 (aiii)</b>	A description including <ul style="list-style-type: none"> <li>• in one direction only for DC (1)</li> <li>• reversing direction for AC (1)</li> </ul>	'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.	<b>(2)</b>

Question Number		Indicative Content	Mark
<b>QWC</b>	<b>*3(b)</b>	<p>A comparison including some of the following ideas</p> <ul style="list-style-type: none"> <li>Transformers can be used or {voltages/currents} can be {changed/transformed}</li> <li>AC (can transmit) at lower current/high(er) voltage</li> <li>National Grid is (usually) over ground (DC cables (were) underground)</li> <li>Less energy lost in transmission</li> <li>National Grid system can supply to customers further away</li> <li>Possible to create a grid linking power stations</li> <li>More flexibility in voltage for consumer</li> <li>Consumer can draw large(r) current</li> <li>More flexibility in power drawn</li> <li>Great(er) range of devices can be powered</li> </ul> <p>Ignore methods of electricity production</p>	<b>(6) Exp</b>
<b>Level</b>	<b>0</b>	No rewardable content	
<b>1</b>	<b>1 - 2</b>	<ul style="list-style-type: none"> <li>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.)</li> <li>the answer communicates ideas using simple language and uses limited scientific terminology</li> <li>spelling, punctuation and grammar are used with limited accuracy</li> </ul>	
<b>2</b>	<b>3 - 4</b>	<ul style="list-style-type: none"> <li>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</li> <li>the answer communicates ideas showing some evidence of clarity and organisation and uses scientific terminology appropriately</li> <li>spelling, punctuation and grammar are used with some accuracy</li> </ul>	
<b>3</b>	<b>5 - 6</b>	<ul style="list-style-type: none"> <li>A detailed comparison including at least three ideas, with at least one direct link between two of them.</li> <li>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.</li> <li>the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately</li> <li>spelling, punctuation and grammar are used with few errors</li> </ul>	

Total for Question 6 = 12 mark

Question Number	Answer	Acceptable answers	Mark
<b>4(a)(i)</b>	C		<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>4(a)(ii)</b>	B		<b>(1)</b>

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

Question Number	Answer	Acceptable answers	Mark
<b>4(c)(i)</b>	Correct responses can be seen in (i) r (ii) An explanation linking <ul style="list-style-type: none"> <li>• <u>electrons</u> (1)</li> </ul> and <u>one</u> of <ul style="list-style-type: none"> <li>• removed by friction (1)</li> <li>• (transferred) <u>to</u> plastic (1)</li> </ul>	["positive electrons/ protons moving", seen anywhere in part (i) or (ii) loses this mark]  ignore reference to charge before rubbing  transferred from cloth	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>4(c)(ii)</b>	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	<b>(2)</b>

Total question 1 = 8 marks