

Chemistry GCSE Unit 1: Paper 1 Mark Scheme

Question Number	Marking Guidelines	Additional Information								
1.(a)(i)	0;	<b>Ignore</b> +/- before 0.								
1.(a)(ii)	Protons have a positive charge; Electrons have a negative charge; Charges cancel out/balance;	'Protons and electrons have opposite charges' = <b>1 mark</b>  <b>Reject</b> concept of protons or electrons having charge greater than 1.								
1.(b)(i)	Same number of protons (as in first diagram)/two protons;	<b>Accept</b> <u>isotope</u> of first diagram.								
1.(b)(ii)	<b>Any two from:</b> Helium has 2 electrons in its (outer) shell;  Full <u>outer shell</u> of electrons;  Atoms react to fill their outer shell/(helium) doesn't need to gain/lose electrons;	<b>Ignore</b> noble gas/group 8/0.								
1.(c)(i)	2 crosses in inner shell; 8 crosses in outer shell;	Electrons may be dots, crosses or e's. Accept any symbol for electrons.								
1.(c)(ii)	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Name</th> <th style="text-align: left;">Number</th> </tr> </thead> <tbody> <tr> <td>Protons</td> <td><b>10</b></td> </tr> <tr> <td>Neutrons</td> <td><b>10</b></td> </tr> <tr> <td><b>Electrons</b></td> <td><b>10</b></td> </tr> </tbody> </table> <p>First mark for Electrons; Second mark for 10 neutrons; Third mark for 10 Protons <b>and</b> 10 electrons;</p>	Name	Number	Protons	<b>10</b>	Neutrons	<b>10</b>	<b>Electrons</b>	<b>10</b>	<b>Allow</b> incorrect spelling of 'electrons as long as electron is clearly what is meant.
Name	Number									
Protons	<b>10</b>									
Neutrons	<b>10</b>									
<b>Electrons</b>	<b>10</b>									
2.(a)(i)	Naturally occurring rocks <b>AND</b> containing copper/copper compounds;	Candidate must mention both naturally occurring and containing copper for mark.								
2.(a)(ii)	Carbon Dioxide/CO <sub>2</sub> ;									

2.(a)(iii)	Carbon <u>more</u> reactive than copper/carbon higher up reactivity series than copper;  Carbon displaces copper;	First marking point needs comparison between carbon and copper.
2.(b)(i)	<b>Benefits (max 1 mark)</b> <ul style="list-style-type: none"> <li>▪ Can use existing infrastructure/named infrastructure (roads/electricity/water supply);</li> <li>▪ Nearby workforce;</li> <li>▪ Can extract copper (to make money);</li> </ul> <b>Drawbacks (max 1 mark)</b> <ul style="list-style-type: none"> <li>▪ May face legal action/complaints from residents;</li> <li>▪ Damage reputation of company;</li> </ul>	<b>Do not allow</b> 'to make money' on its own.
2.(b)(ii)	<b>Benefits (max 1 mark)</b> <ul style="list-style-type: none"> <li>▪ New employer/residents of the village can get a job;</li> <li>▪ Brings wealth to the village/region/local economy;</li> </ul> <b>Drawbacks (max 1 mark)</b> <ul style="list-style-type: none"> <li>▪ (Copper extraction) creates eye-saw/reduces beauty of the environment/reduces house prices;</li> <li>▪ Noise pollution;</li> <li>▪ Increased traffic on roads;</li> </ul>	Accept any suitable benefit and drawback.
2.(b)(iii)	No more copper ore/all copper ore extracted/used;	
2.(c)(i)	Conducts electricity;	
2.(c)(ii)	Doesn't react with water/non-toxic/hard enough to be used to make pipes;	
2.(d)	Electrolysis/phytomining/bioleaching;	
3.(a)(i)	<u>Ethane</u> ;	
3.(a)(ii)	Only contains single bonds/no double bonds/cannot add anymore hydrogen;	

3.(a)(iii)	<p><b>Any four from:</b></p> <p>Crude oil is a long chain hydrocarbon;</p> <p>Crude oil heated causing chains to break/split;</p> <p>Cools as it rises (up fractionating column);</p> <p>Different sized hydrocarbons have different boiling points/condense at different temperature/heights;</p> <p>Different sized hydrocarbons run off from column at different heights;</p>	<p><b>Accept</b> 'crack'.</p> <p><b>Not</b> melting points.</p>
3.(b)	<p><b>A</b> in top box;</p> <p><b>B</b> in either middle boxes;</p>	<p><b>Negate one mark</b> for <b>A</b> in more than one box and <b>negate second mark</b> if <b>B</b> in more than one box.</p>
3.(c)(i)	Oxidised;	Multiple ticks negate mark.

3.(c)(ii)	<p><b>Any 5 from:</b>  CO<sub>2</sub> produced;  Leads to global warming/rising global temperatures;  increasing sea levels/flooding/disruption to weather patterns/animal behaviour;</p> <p>Sulphur impurities in fuel;  Sulphur dioxide produced;  Causes acid rain/damages limestone buildings/statues/harms aquatic life;</p> <p>Solid particles/particulates;  Global dimming;</p> <p>Carbon monoxide;  Toxic;</p>	<p><b>Ignore</b> references to water vapour or nitrogen oxides.</p>
3.(c)(iii)	<p><b>Any pair:</b>  Remove sulphur impurities;  So no sulphur dioxide produced/no acid rain;  <b>OR</b>  (Switch to) using biofuels;  Carbon neutral/no net increase in CO<sub>2</sub> levels;  <b>OR</b>  Carbon capture;  To prevent release of CO<sub>2</sub> into the atmosphere;</p>	<p>Second mark dependant on first.  <b>Ignore</b> drive less/use less fuels.</p>