

Question Number	Acceptable Answers	Reject	Mark
<p><b>1 (a)</b> <b>QWC</b></p>	<p><b>Each mark is a stand alone mark.</b></p> <p><b>First mark:</b></p> <p>hydrogen bonds in <b>both</b> ethanoic acid and ethanol OR no hydrogen bonds in ethanal (1)</p> <p><b>Second mark:</b></p> <p>hydrogen bonds are stronger than van der Waals' / dipole-dipole/London/dispersion/ induced dipole / permanent dipole /intermolecular forces (in ethanal) OR hydrogen bonds are the strongest/strong intermolecular forces (1)</p> <p><b>Third mark:</b></p> <p>ethanoic acid has more electrons/ethanoic acid has the most electrons OR ethanoic acid is dimeric OR ethanoic acid forms dimers OR description of ethanoic acid dimers (N.B. In the context of dimerisation, ignore statement that "ethanoic acid forms two hydrogen bonds per molecule") OR ethanoic acid is more polar because of having more oxygen atoms (1)</p>	<p>any reference to hydrogen bonding in ethanal</p> <p><b>just</b> references to ethanol and ethanoic acid forming H bonds <b>with water</b></p> <p>references to breaking <b>covalent</b> bonds</p> <p><b>Just</b> "ethanoic acid has more hydrogen bonds than ethanol"</p>	<p><b>3</b></p>

Question Number	Acceptable Answers	Reject	Mark
1 (b)(i)	<p><b>(Test):</b> 2,4-dinitrophenylhydrazine /Brady's reagent/2,4-dnp/ 2,4-DNP/2,4-DNPH (1)</p> <p><b>(Result):</b>yellow precipitate /orange precipitate /red precipitate</p> <p>ALLOW: 'solid' or 'crystals' in lieu of precipitate (1)</p> <p><b>Result mark for result CQ on correct reagent (or a near miss reagent (e.g. 2,4-DHPN))</b></p>	<p>1,2-DNP etc/ hydrazine / /2,4-dinitrophenolhydrazine /2,4-dinitrophenylhydrazone</p>	2

Question Number	Acceptable Answers	Reject	Mark
1 (b)(ii)	<p>(Warm with) Fehling's (solution) / Benedict's (solution) (1)</p> <p>red precipitate/brown precipitate/brick-red precipitate (1)</p> <p>ALLOW "solid" ALLOW "red Cu<sub>2</sub>O" ALLOW yellow/orange solid for Benedict's test</p> <p><i>Penalise omission of "solid" once only in parts (b)(i) and (b)(ii)</i></p> <p><b>OR</b> (Warm with) Tollens' (reagent) (1)</p> <p>silver (mirror)/black(solid) (1)</p> <p><b>(N.B. here, solid not required)</b></p> <p><b>OR</b> (Warm with) ammoniacal silver nitrate (solution) (1)</p> <p>silver (mirror)/ black / dark-grey (solid) (1)</p> <p><b>(N.B. here, solid not required)</b></p> <p>2nd mark CQ on correct reagent or a near miss</p> <p><i>Penalise omission of "solid" once only in (b)(i) and (b)(ii)</i></p>	<p>acidified potassium dichromate(VI) / manganate(VII) (0)</p> <p>iodoform reaction (0)</p> <p>just "red due to Cu<sup>+</sup>" / "red solid due to Cu<sup>3+</sup>" (0)</p>	2

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1 (c)(i)	<p>(1) both arrows (1)</p> <p>(1)</p> <p><i>IGNORE</i> any dipoles shown</p> <p>Check curly arrows are all <b>double-headed</b> in mechanism. (If all arrows are <b>single-headed</b>, can only score intermediate mark.)</p> <p><b>Accept:</b> arrow to an H<sup>+</sup> instead of an H-CN for third mark. [It is <b>not</b> necessary to show the lone pairs.]</p> <p><i>IGNORE</i> any equations which generate CN<sup>-</sup> ions</p>	<p>← N</p> <p>arrow from N in CN<sup>-</sup></p>	3

Question Number	Acceptable Answers	Reject	Mark
1 (c)(ii)	<p>With HCN alone, insufficient CN<sup>-</sup></p> <p>OR</p> <p>KCN provides (sufficient) CN<sup>-</sup></p> <p>OR</p> <p>KCN increases the concentration of CN<sup>-</sup></p> <p><i>ALLOW</i> "nucleophile" instead of CN<sup>-</sup></p> <p><i>IGNORE</i> any subsequent comments about the role of the CN<sup>-</sup> ion</p>	<p>Just "HCN is a weak acid"</p> <p>OR</p> <p>HCN "is too weak a nucleophile"</p>	1

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1 (c)(iii) QWC	<p><b>These are stand alone marks</b></p> <p><b>First mark:</b></p> <p>attack from both sides  <b>OR</b>  attack from above and below</p> <p style="text-align: right;"><b>(1)</b></p> <p><b>Second mark:</b></p> <p>(gives) racemic mixture / (gives) equal amounts of each isomer / (gives) equal amounts of each enantiomer</p> <p style="text-align: right;"><b>(1)</b></p>	<p>attack on a (planar) carbocation  OR attack on a (planar) intermediate  OR  S<sub>N</sub>1  OR  S<sub>N</sub>2</p> <p>“planar product”</p>	<b>2</b>