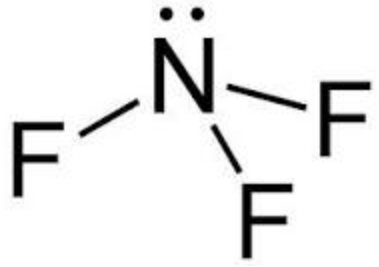
Section B

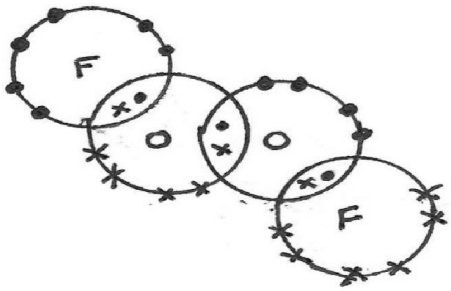
Question Number	Acceptable Answers	Reject	Mark
13(a)(i)	Ignore drawn shapes Shape is **trigonal planar/ triangular planar** **(1)** Bond angle 120(°) **(1)** Mark independently BUT no TE on incorrect shape	…pyramidal **Just** planar °C	**(20**

Question Number	Acceptable Answers	Reject	Mark
***13(a)(ii)**	(Shape) Ignore references to tetrahedral/pyramidal  **NOTE:** Lone pair on central N atom NOT required **ALLOW:** Any correct variation as long as the shape is clear **(1)** (Bond angle) 107° **ALLOW** Any angle between 106° – 108° **OR** 102° (as this is the actual bond angle) **(1)** Mark independently (Explanation) Minimum repulsion/maximum separation (between pairs of electrons) **(1)** Lone pair-bond pair repulsions are **greater/more** than bond pair-bond pair repulsions **ALLOW** Lone pair(s) **repel more than bond pair(s)** **(1)** Mark independently	No M1 if incorrect name for shape eg bipyramidal …between atoms / **Just** bonds repel	**(4)**

Question Number	Correct Answer	Reject	Mark
13(a)(iii)	**M1** F F | | F—N→B—F | | F F OR F F | | F—N—B—F | | F F OR Dot and cross diagram, allow all dots or crosses. IGNORE omission of non-bonding electrons on Fs. But no mark if dot and cross shown for N-B bond. **(1)** **M2 Dative covalent** (bond) **(1)** Mark independently	No M1 if dative bond **categorically from** B **to** N	**(2)**

Question Number	Correct Answer	Reject	Mark
13(b)(i)	+2 **ALLOW** 2+		**(1)**

Question Number	Correct Answer	Reject	Mark
13(b)(ii)	$OF_2 + H_2O \rightarrow 2HF + O_2$ Ignore state symbols even if incorrect Allow multiples	H_2F_2	**(1)**

Question Number	Correct Answer	Reject	Mark
13(c)	Accept all dots OR all crosses 		**(1)**

(Total for Question 13 = 11 marks)

Question Number	Correct Answer	Reject	Mark
14(a)(i)	As a (co-)solvent for both aqueous silver nitrate and bromoalkane OR As a (co-)solvent for polar and non-polar molecules OR To dissolve the halogenoalkane (as it is not water soluble) OR To allow the reagents/reactants to mix/dissolve		**(1)**

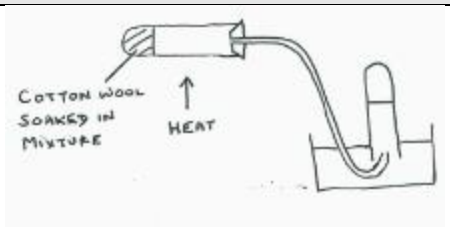
Question Number	Correct Answer	Reject	Mark
14(a)(ii)	$C_4H_9Br + H_2O \rightarrow C_4H_9OH + HBr$ OR $C_4H_9Br + H_2O \rightarrow C_4H_9OH + H^+ + Br^-$ Ignore state symbols even if incorrect		**(1)**

Question Number	Correct Answer	Reject	Mark
14(a)(iii)	Cream **ALLOW** **Pale** yellow/off-white **(1)** $Ag^+(aq) + Br^-(aq) \rightarrow AgBr(s)$ **(1)**	**Just "**yellow" **Just "**white"	**(2)**

Question Number	Correct Answer	Reject	Mark
14(a)(iv)	**Concentrated** ammonia (solution) / **Concentrated** NH_3 ((aq)) ALLOW 'c' or 'conc' for concentrated **IGNORE** References to "excess"		**(1)**

Question Number	Correct Answer	Reject	Mark
14(a)(v)	**C**, **B**, **A** **NOTE** The letters must be in this order		**1**

Question Number	Correct Answer	Reject	Mark
***14(a)(vi)**	**Any two from** • Tertiary is the fastest / primary is the slowest • The C-Br bond is weakest in 2-methylbromopropane / in the tertiary (compound) ALLOW here: The weaker the C-Br bond, the faster the hydrolysis • (This is because the) methyl groups donate electrons OR methyl groups are electron releasing OR (positive) inductive effect of methyl groups **IGNORE** Any resultant effect on the polarity of the C-Br bond, even if incorrect • Tertiary carbocation OR intermediate formed by tertiary is (more) stable ALLOW branched for tertiary in all points **IGNORE** Any references to steric hindrance Any references to S_N1 and/or S_N2	If states that tertiary bromoalkane **dissolves** fastest	**(2)**

Question Number	Correct Answer	Reject	Mark
14(b)(i)	 **M1: All three of the following points** • (Cotton) wool / mineral wool / ceramic fibre (soaked in reactant) • in a reasonably horizontal test tube • heating (shown anywhere under horizontal tube) **(1)** **M2:** Collection of gas over water / in a gas syringe **(1)** Ignore Bunsen valve Mark these scoring points independently		**(2)**

Question Number	Correct Answer	Reject	Mark
14(b)(ii)	But-1-ene **ALLOW** 1-butene **(1)**  **(1)**	Butene Butan-1-ene Butanene	**(2)**

Question Number	Correct Answer	Reject	Mark
14(c)(i)	(Type) substitution **(1)** (Mechanism) nucleophilic **(1)** Allow words in either order **Just** "$S_N 2$" scores one mark	Elimination Electrophilic / (free) radical $S_N 1$	**(2)**

Question Number	Correct Answer	Reject	Mark
14(c)(ii)	Butylamine/1-aminobutane/1-butylamine		**(1)**

(Total for Question 14 = 15 marks)