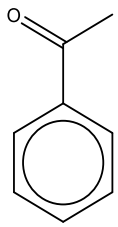
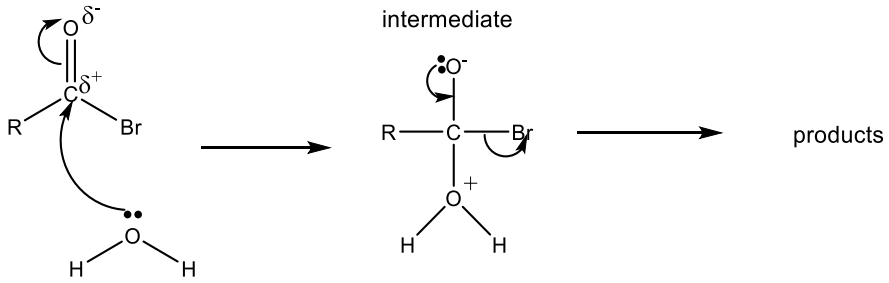
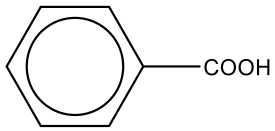
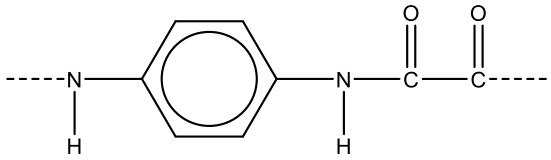
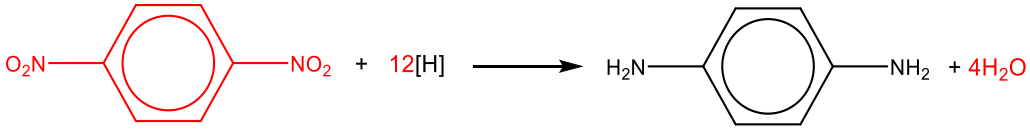
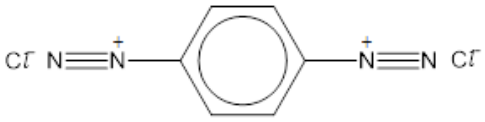
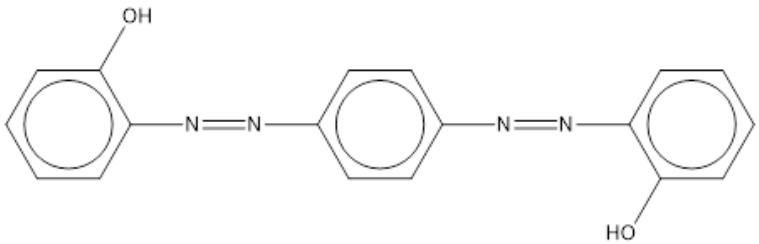
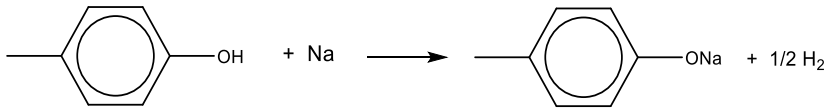
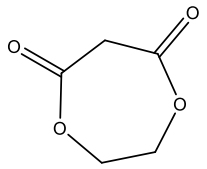
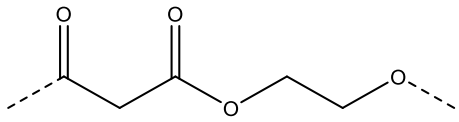
8(a)(i)	NO_2 group directs to 3 (and 5) / meta position **AND** due to being an electron-withdrawing / electronegative group
8(a)(ii)	$HNO_3 + H_2SO_4 \rightarrow NO_2^+ + HSO_4^- + H_2O$ **OR** $HNO_3 + 2H_2SO_4 \rightarrow NO_2^+ + 2HSO_4^- + H_3O^+$
8(b)(i)	
8(b)(ii)	**M1:** (reaction 1) ethanoyl chloride / CH_3COCl **AND** $AlCl_3$ **M2:** (reaction 2) 2-bromopropane / $(CH_3)_2CHBr$ **AND** $FeBr_3$
8(c)	**M1:** with C_6H_5Br no change / no precipitate **AND** with $C_6H_5CH_2Br$ cream precipitate in C_6H_5Br **M2:** lone pair / p-orbital on Br delocalised / overlaps with ring / π system **M3:** C–Br bond stronger / has partially double bond character
8(d)(i)	(nucleophilic) addition–elimination
8(d)(ii)	 **M1 M2:** • lone pair on O • curly arrow from (lone pair) O (in H_2O) to C (of C=O) • correct dipole on C=O • curly arrow from the C=O bond to O atom any two [1], all four [2] **M3:** correct intermediate **M4:** curly arrow from (lone pair on) $O^{(-)}$ to C–O bond **AND** curly arrow from C–Br to Br

7(a)	**M1:** $ClCH_2COOH$ $BrCH_2COOH$ CH_3COOH CH_3CH_2OH most acidic least acidic **M2:** electron withdrawing groups / electronegative groups / negative inductive effect **AND** weakens O–H bond / more stable anion **OR** electron donating groups / positive inductive effect **AND** strengthens O-H bond / less stable anion **M3 M4:** • chlorine is more electron-withdrawing / electronegative than bromine (related to XCH_2COOH) • electron withdrawing of C=O / negative inductive effect of C=O (related to COOH) • positive inductive effect / electron donating of alkyl / ethyl / R group (related to ROH) any two [1], all three [2]
7(b)	**M1:**  **M2:** CO_2
7(c)(i)	 **M1**: correct displayed amide bond with C=O, (C_6H_5)–N and (C–)C=O **M2**: rest of the structure correct with continuation bonds
7(c)(ii)	
7(d)(i)	**M1:**  **M2:** 

7(d)(ii)	HNO_2 (and HCl) **AND** ⩽10 °C **OR** $NaNO_2$ **AND** HCl **AND** ⩽10 °C

7(a)	**M1:** (most acidic) benzoic acid 4-methylphenol water (least acidic) phenylmethanol **M2:** correct link of acidity to weakens O—H / H^+ more easily lost / anion stabilised / conjugate base stabilised **M3** and **M4:** any two [2] • for benzoic acid: negative inductive effect of C=O / electronegative C=O / two electronegative O / –ve charge delocalised (across two O) / resonance in $–COO^-$ • for 4-methylphenol: as lone pair on oxygen delocalised into the ring / π system / delocalised system **OR** p orbital on oxygen overlaps with ring / π system / delocalised system • for phenylmethanol: positive inductive effect of alkyl group / R / CH_2
7(b)	
7(c)(i)	
7(c)(ii)	(reaction 10) addition–elimination / condensation / esterification **AND** (reaction 11) addition–elimination / condensation (polymerisation) / esterification
7(c)(iii)	 **M1:** ester linkage shown **M2:** rest of the structure correct with continuation bonds