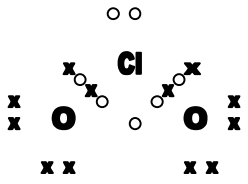
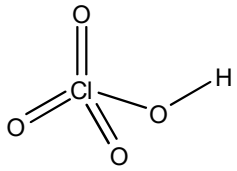
Question 6			Mark
(a)		 Bond angle: 110 – 120^{o} *(actual angle: 117.4)*	1 1
(b)	**(i)**	Oxidation state of chlorine in ClO_2: + 4 Oxidation state of chlorine in $HClO_3$: + 5 Oxidation state of chlorine in $HClO_4$: + 7 *Award 2 marks for all 3 correct, 1 mark for 2 correct*	2
	(ii)	$3HClO_3 \longrightarrow 2ClO_2 + HClO_4 + H_2O$	1
	(iii)	Structure:  Bond angle: 109.5^{o} (109^{o} 28') *(allow 109^{o})*	1 1
(c)		$2NaClO_3 + SO_2 \xrightarrow{(H_2SO_4)} 2ClO_2 + Na_2SO_4$ *Allow as ionic*	1
(d)		$2NaClO_3 + (COOH)_2 + H_2SO_4 \longrightarrow 2ClO_2 + 2CO_2 + 2H_2O + Na_2SO_4$ *Allow as ionic: $2ClO_3^- + (COOH)_2 + 2H^+ \longrightarrow 2ClO_2 + 2CO_2 + 2H_2O$*	1
(e)	**(i)**	$NaClO_2$	1
	(ii)	$2NaClO_2 + Cl_2 \longrightarrow 2ClO_2 + 2NaCl$	1
			Marks = 11