

<i>Qn. No.</i>	<i>Value Points / key</i>	<i>Scoring scheme</i>	<i>Total score</i>
1 (a) (b)	Oxidizing agent: $\text{Cr}_2\text{O}_7^{2-}$, Reducing agent: Fe^{2+} $\text{Cr}_2\text{O}_7^{2-} + 6\text{Fe}^{2+} + 14\text{H}^+ \rightarrow 6\text{Fe}^{3+} + 2\text{Cr}^{3+} + 7\text{H}_2\text{O}$	1 3	4
2 (a) (b) (c)	Any one method of preparation or equation Open book structure In wax lined coloured bottles	1 1 1	3
3 (a) (b)	Excitation of electrons to higher levels and liberation of energy to ground state by emitting radiations which fall in the visible region of the electromagnetic spectrum The energy of the flame is not sufficient to excite the electrons to higher levels due to their small size	2 1	3
4 (a) (b)	CH_4 – tetrahedral, NH_3 – pyramidal, H_2O – V shaped The presence of one lone pair in NH_3 and two lone pairs in H_2O	2 3	5
5 (a) (b)	Two wrong postulates of kinetic theory of gases and mentioning of these postulates Low pressure and high temperature	2 1	3
6 (a) (b) (c)	Extensive: volume, heat capacity, pressure Intensive: Density, specific heat capacity, boiling point Statement of law If $\Delta G =$ negative the process is spontaneous	2 2 1	5
7 (a) (b)	Due to the increase in concentration of Cl^- , the ionic product exceeds the solubility product of NaCl and so precipitation takes place $4\text{S}^3 = 5 \times 10^{-12}$	2 2	4
8 (a) (b) (c)	Correct MO diagram Due to the presence of two unpaired electrons in two MOs $\text{BO} = 2$	2 1 1	4
9 (a) (b) (c)	Acid – proton donor, Base – proton acceptor NH_4Cl – acidic, CH_3COONa – basic, KCl - neutral $\text{HCl} - \text{Cl}^-$, $\text{H}_2\text{O} - \text{H}_3\text{O}^+$	1 3 1	5

10 (a)	CH ₃	1	
(b)	30/6.022 x 10 ²³ grams	1	4
(c)	6.022 x 10 ²⁴ molecules	2	
11(a)	n = 1, l = 0 < n = 3, l = 1 < n = 3, l = 2 < n = 4, l = 1	2	
(b)	correct shapes	2	4
12 (a)	CH ₄ , CO ₂ , BCl ₃ , BeF ₂	2	
(b)	Orbital dipole moment in NF ₃ is in opposite direction to that of the dipole moments of bonds	2	4
13 (a)	$\Delta U = q + W$ $\Delta U = 1000 - 100 = 900$ J	2	
(b)	Correct statement	1	3
14 (a)	Correct periodic law	1	
(b)	Ununbium	1	
(c)	Li, cation is smaller than the corresponding atom due to the more effective attraction by the nucleus on the removal of one electron	2	4
15 (a)	NO ₂ , CO ₂	1	
	NH ₃ , HCl mixture readily reacts	1	
(b)	Correct statement	2	
(c)	Partial pressure of a gas = mole fraction of that gas x total pressure	1	5