

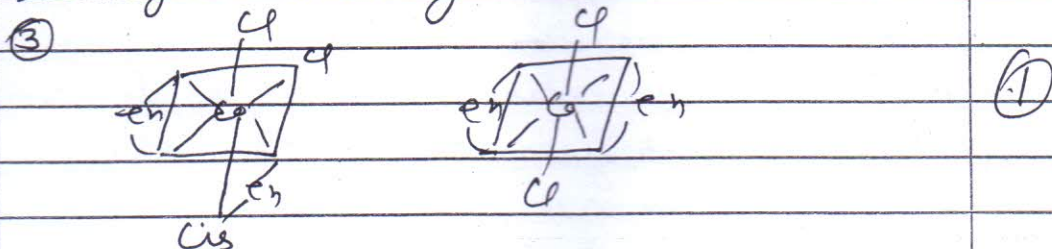
IInd Pre-Board Exam 2016 ①

| S. No. | Marking Scheme Chem XII | Marks Q wise |
|--------|---|--------------|
| Ans 1. | This can be done :- ① By adding an electrolyte ② by adding a suitable solvent. | ① |
| A-2 | X_2Y_3 | ① |
| A-3 | Because Bi(V) is more stable than Sb(V) due to inert pair effect. | ① |
| A-4 | 2-Bromo-3-methyl but-2-en-1-ol | ① |
| A-5 | It is kept in dark closed bottle to prevent its oxid ⁿ to phosgene. $2CHCl_3 + O_2 \rightarrow 2COCl_2 + 2HCl$ | ① |
| A-6 | The steady decrease in the size of lanthanoid metals or ions M^{+3} with increase in atomic number is called lanthanoid contraction. Uses :- ① Mischmetal alloy of lanthanoid is used in making bullets, shells & lighter flint. ② La_2O_3 is used in making coloured glasses | ① |
| A-7 | ① Pentaammine thiocyanato-S-chromium (III) Chloride ② $[Ni(H_2O)_6](ClO_4)_2$ | ① ① |
| A-8 | (i) H_2 in presence of Pd/BaSO ₄ (ii) $KMnO_4/H^+$ | ① ① |
| A-9. | If a solution of two volatile liquids has a v.p more than that predicted on the basis of Raoult's law at a particular temp, then the solution is said to exhibit +ve deviation from Raoult's Law. eg:- a solution of ethanol & acetone ΔH_{mix} is +ve | ① ① ① |
| | OR. | |
| | Azeotropes are binary mixtures having the same composition in liquid & vapour phase & boil at a constant temperature. Low boiling azeotropes is formed for eg a mixture of ethanol (95%) & water (5%) | ① ① |

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| A-10 | (i) $\Lambda_{m}^{\circ}(\text{Na}_2\text{SO}_4) = 2\lambda_{\text{Na}^+}^{\circ} + \lambda_{\text{SO}_4^{2-}}^{\circ}$ $= 2 \times 50 + 160 = 260 \text{ S cm}^2 \text{ mole}^{-1}$ | ① |
| | (ii) At Anode: $2\text{H}_2\text{O} + 4\text{OH}^- \rightarrow 4\text{H}_2\text{O} + 4\text{e}^-$ At Cathode: $\text{O}_2 + 2\text{H}_2\text{O} + 4\text{e}^- \rightarrow 4\text{OH}^-$ | ① |
| A-11 | $w_2 = 0.3 \text{ g}$ $w_1 = 30 \text{ g}$ $\Delta T_f = 0.45 \text{ K}$ $K_f = 5.12 \text{ K kg mole}^{-1}$ | |
| | $M_2 = \frac{K_f \times w_2 \times 1000}{\Delta T_f \times w_1}$ | ① |
| | $M_2 = \frac{5.12 \times 0.3 \times 1000}{0.45 \times 30} = 113.77 \text{ g/mol}$ | ① |
| | $i = \frac{M_{\text{th}}}{M_{\text{ob}}} = \frac{60}{113.77} = 0.527$ | ① |
| A-12 | (i) Role of NaCN in the extraction of Ag is to do the leaching of Ag ore in the presence of air from which Ag is obtained later by replacement with Zn | |
| | $4\text{Ag} + 8\text{CN}^- + 2\text{H}_2\text{O} + \text{O}_2 \rightarrow 4[\text{Ag}(\text{CN})_2]^- + 4\text{OH}^-$ | ① |
| | $[\text{Ag}(\text{CN})_2]^- + \text{Zn} \rightarrow [\text{Zn}(\text{CN})_4]^{2-} + \text{Ag}$ | |
| | (ii) Iodine is heated with Ti to form a volatile comp which on further heating decompose to give pure Ti | ① |
| | $\text{Ti} + 2\text{I}_2 \rightarrow \text{TiI}_4 \xrightarrow{\Delta} \text{Ti} + 2\text{I}_2$ | |
| | (iii) Cryolite lowers the melting pt of mix & increase the conductivity of mixture | ① |
| A-13 | For bcc $r = \frac{\sqrt{3}}{4} a = \frac{\sqrt{3}}{4} \times 287 = 124.27 \text{ pm}$ | ① |
| | $Z = 2$ | |
| | $d = \frac{ZM}{a^3 \times N_A}$ | ① |
| | $d = \frac{2 \times 52}{(287 \times 10^{-10})^3 \times 6.022 \times 10^{23}}$ | ① |
| | $d = 7.3 \text{ g/cm}^3$ | ① |

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| 14a) | This is due to shielding provided by 5f-electrons (actinoids) is poorer than that provided by 4f e(s) (lanthanoids) as 5f e cloud is much more diffused than 4f e cloud ① | |
| b) | This is due to d-d transition ① | |
| c) | $2\text{MnO}_4^- + 6\text{H}^+ + 5\text{NO}_2^- \rightarrow 2\text{Mn}^{2+} + 3\text{H}_2\text{O} + 5\text{NO}_3^-$ ① | |

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| 15 | <p>a) $[\text{Cr}(\text{NH}_3)_4(\text{H}_2\text{O})_2]\text{Cl}$ → $\text{Cr}^{+3} \rightarrow 3d^3$ Hyb is d^2sp^3 octahedral</p> <p>i) Ni (Z=28) in its atomic/Ionic state cannot have two vacant 3d orbitals hence d^2sp^3 Hyb is not possible ①</p> <p>ii) Transition metals have unpaired e(s) & vacant d orbitals to accept the e density from the ligand containing π-e(s). ①</p> | |
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| Q16 | <p>$\text{Fe} / \text{Fe}^{+2}$ from paper</p> $E_{\text{cell}} = E_{\text{cell}}^{\circ} - \frac{0.0591}{2} \log \frac{[\text{Fe}^{+2}]}{[\text{H}^+]^2}$ $E_{\text{cell}}^{\circ} = 0.00 - (-0.44)$ $E_{\text{cell}} = 0.44 - \frac{0.0591}{2} \log \frac{.001}{(1)^2}$ $= 0.44 - 0.0295 \times (-3)$ $= 0.44 + 0.0885 = 0.5285\text{V}$ | <p>①/2</p> <p>①/3</p> <p>①</p> <p>①</p> |
|-----|---|---|

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| A-17 | <p>a) A deep red sol of $\text{Fe}(\text{OH})_3$ is obtained by the hydrolysis of FeCl_3. The sol particles are +vely charged due to the preferential adsorption of Fe^{+3} ions. ①</p> $\text{Fe}(\text{OH})_3 + \text{Fe}^{+3} \rightarrow \text{Fe}(\text{OH})_3 / \text{Fe}^{+3}$ <p>b) Phy. adsorption is an exothermic process so the</p> | |
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