**SECOND YEAR HIGHER SECONDARY EXAMINATION, MARCH 2016.**
**(Finalised Scheme of Valuation)**

**Subject: Part III Chemistry** **Code No: 1016**

| Qn.No | Scoring Indicators | Split Score | Total Score |
|---|---|---|---|
| 1. a) | (c) Ice | 1 | |
| b) | Primitive unit-cell - constituent particles present only on the corner positions of unit cell or diagram | ½ | |
| | Centered unit cell - one or more constituent particles in positions other than corners in addition to corners. or diagram | ½ | 4 |
| c) | F centre or colour centre or metal excess defect due to anion vacancy | 2 | |
| 2 a) | b) Molality | 1 | |
| b) | If $i > 1$ dissociation or $i < 1$ association or $i \neq 1$ or definition or equation | 1 | |
| c) | $P_1^0 = 0.85$ bar, $P = 0.845$ bar, molar mass $= 78\ g\ mol^{-1}$, $w_2 = 0.5\ g$ $w_1 = 39\ g$ or | | 4 |
| | $\frac{P_1^0 - P_1}{P_1^0} = \frac{w_2 \times M_1}{w_1 \times M_2}$ | 1 | |
| | $\frac{0.85 - 0.845}{0.85} = \frac{0.5 \times 78}{39 \times M_2}$ | 1 | |

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|---|---|---|---|
| 3 a) | d) None of these | 1 | |
| b) | Inverse or reciprocal of resistance or $G = \frac{1}{R}$ | 1 | |
| c) | Anode: $H_{2(g)} + 2\bar{O}H \rightarrow 2H_2O_{(l)} + 2e^-$ or | | 4 |
| | Cathode: $O_{2(g)} + 2H_2O_{(l)} + 4e^- \rightarrow 4\bar{O}H$ or | 2 | |
| | Net reaction: $2H_{2(g)} + O_{2(g)} \rightarrow 2H_2O_{(l)}$ | | |
| 4 i) | c) 3 | 1 | |
| ii) a) | Change in concentration of reactant or product in unit time or correct expression | 1 | |
| b) | rate of reaction increases with temperature or Arrhenius equation or correct explanation | 1 | 4 |
| iii) | $t_{1/2} = \frac{0.693}{K}$ | ½ | |
| | $t_{1/2} = \frac{0.693}{5.5 \times 10^{-14}}$ | ½ | |
| 5 i) a) | Reactants and Catalyst in same phase | 1 | |
| b) | One correct example | 1 | 3 |
| ii) | c) Gum or d) Lamp black | 1 | |
| 6 a) | d) Calamine | 1 | |
| b) | Van Arkel method or Vapour phase refining | 1 | 3 |
| | Explanation or Equation | 2 | |
| | $Zr + 2I_2 \rightarrow ZrI_4$ ; $ZrI_4 \xrightarrow{\Delta} Zr + I_2$ | | |

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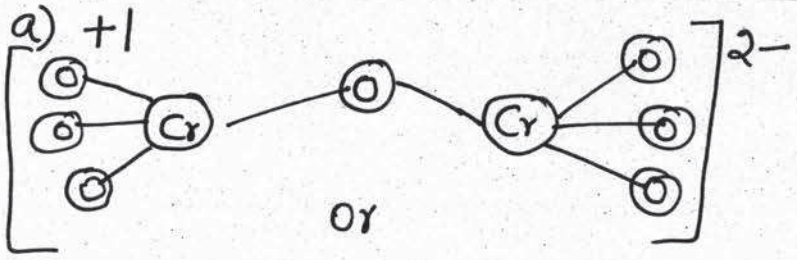
|---|---|---|---|
| 7a i) | Presence of lone pair electron or structure of ammonia showing lone pair of electron | 1 | |
| ii) | Formation of HCl or $PCl_3 + 3H_2O \rightarrow H_3PO_3 + 3HCl$ | 1 | |
| iii) | Most electronegative element or absence of d-orbital | 1 | |
| b i) | $XeF_2$, $XeF_4$, $XeF_6$ (any two) | 1 | |
| ii) | Any One method of Preparation $Xe + F_2 \longrightarrow XeF_2$ $Xe + 2F_2 \longrightarrow XeF_4$ $Xe + 3F_2 \longrightarrow XeF_6$ | 1 | 5 |
| a i) | Hydrogen bonding in $H_2O$ | 1 | |
| ii) | van der waal forces / weak dispersion forces or intermolecular forces | 1 | |
| iii) | due to odd no. of electrons or unshared electron / structure of $NO_2$ showing odd electron / 7e⁻ in valence shell / to complete octet / to attain stability | 1 | |
| b i) | Formed by halogens with each other or general formula | 1 | |
| ii) | any two examples | 1 | |
| 8a) | a) +1 | 1 | |
| b) |  or $Cr_2O_7^{2-}$ | 1 | 4 |
| c) | Any two equations or statement | 2 | |

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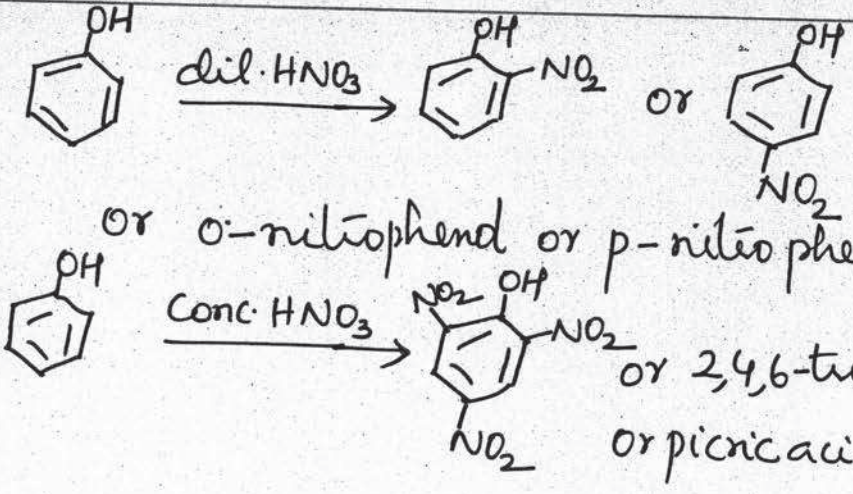
|---|---|---|---|
| 9 a) | $[Co(NH_3)_5SO_4]Cl$ | 1 | |
| b) | IUPAC name of the compound or isomer | 1 | |
| c) | $[Ni(CO)_4]$ contains paired electrons or no unpaired electrons or related explanation<br>Or<br>$[NiCl_4]^{2-}$ contains unpaired electrons or related explanation. | 2 | 4 |
| 10 a) i) | Resonance effect or $sp^2$ hybridisation or instability of phenyl cation or repulsion between nucleophile and e⁻ rich benzene ring | 1 | |
| ii) | One example for nucleophilic substitution of aryl halides | 1 | 4 |
| b) | One method (Equation or explanation) | 1 | |
| c) | d) Chlorobenzene | 1 | |
| 11 a) |  | 1 | |
| | or o-nitrophenol or p-nitrophenol | | |
| |  or 2,4,6-trinitrophenol or picric acid | 1 | 4 |
| b) | Equation or explanation of | | |
| i) | Esterification and | 1 | |
| ii) | Williamson synthesis | 1 | |

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|---|---|---|---|
| 12 a) | Aldehydes are oxidised using mild oxidising agent while ketones are oxidised using strong oxidising agents or Tollen's Test or Fehling's Test or Benedicts Test | 1 | |
| b) | Equation or statement | 1 | |
| c) i) | $RCOOH + SOCl_2 \rightarrow RCOCl + SO_2 + HCl$/statement | 1 | |
| ii) | $RCH_2COOH \xrightarrow{i)\ Cl_2/red\ P} R-\underset{Cl}{CH}-COOH$/statement or HVZ reaction | 1 | 5 |
| iii) | $RCOOH \xrightarrow{LiAlH_4/ether} RCH_2OH$/statement | 1 | |
| a) | Tollen's Test or Fehling's Test or Benedicts test | 1 | |
| b) | Equation or statement | 1 | |
| c) i) | Equation or Oxidation | 1 | |
| ii) | Equation or Hydrolysis | 1 | |
| iii) | Equation or Nitration | 1 | |
| 13 a) | $R_2NH$ or example | ½ | |
| | $R_3N$ or example | ½ | |
| b) | Equation or Reduction | 1 | 3 |
| c) | $NH_2$ of aniline reacts with $AlCl_3$ to form salt or related explanation | 1 | |
| 14 a) | $C_6H_{12}O_6$ or $CHO(CHOH)_4CH_2OH$ or open chain structure or ring structure | 1 | |
| b) | Hydrolysis or equation | 1 | 3 |
| c) | One use of Carbohydrates | 1 | |

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|---|---|---|---|
| 15 a) | Elastomers – Rubber, Buna-S | 1 | |
| | Fibres – Nylon 6,6, Terylene | 1 | 3 |
| b) | Cross linked or heavily branched or non-fusible or not remoulded or example | 1 | |
| 16 a) | b) aspirin | 1 | |
| b) | Definition or example of antiseptics and antibiotics | 2 | 3 |