INDIAN SCHOOL MUSCAT

FIRST PRE-BOARD EXAMINATION

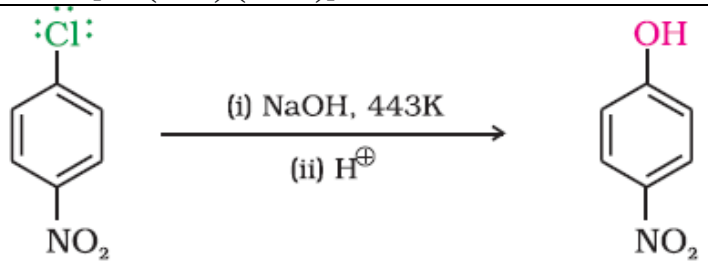
SET A

February 2021

CLASS XII

Marking Scheme – CHEMISTRY [THEORY]

Q.NO.	Answers	Marks (with split up)
1.	i. b ii. c iii. c iv. c (OR) b	1x4=4
2.	i. c ii. a iii. a iv. b/a	1x4=4
3.	None of the answer is correct – 6.023×10^{16}	1
4.	a	1
5.	c	1
6.	b	1
7.	d	1
8.	c/d	1
9.	d	1
10.	d/d	1
11.	d/d	1
12.	b/d	1
13.	a	1
14.	b	1
15.	c	1
16.	b	1
17.	a)Definition b)F-centre	1+1
18.	$M_B = \frac{1000 \times K_f \times W_B}{\Delta T_f \times W_A}$ $= \frac{1000\,K\,kg^{-1} \times 1.86\,K\,kg\,mol^{-1} \times 15\,g}{0.34K \times 450\,g}$ $= 182.35\,g/mol$	2

19.	$pH = 2 \quad \therefore [H^+] = 10^{-2}$ $r_0 = K[10^{-2}]^n$ at $pH = 1, [H^+] = 10^{-1}$ $r_1 = K[10^{-1}]^n \quad \frac{r_1}{r_0} = 100 = [10]^n$ $\therefore n = 2$	2
20.	$t_{99.9\%} = \frac{2.303}{k} \log\frac{100}{0.1}$ $t_{50\%} = \frac{2.303}{k} \log\frac{100}{50}$ $\frac{t_{99.9\%}}{t_{50\%}} = \frac{2.303 \times 3 \times k}{k \times 0.693}$ **$t_{99.9\%} = 10\ t_{50\%}$**	½ 1 ½
21.	a) Brown ring test equation b) Equation of thermal decomposition of sodium azide	1 1
22.	a) d^2sp^3,diamagnetic,octahedral OR i. Dichloridobis(ethylenediamine)cobalt(III) chloride ii. $[CO(NH_3)_5(ONO)]^{2+}$.	2 1+1
23.	 a) b) Correct structure	2
24.	a) Hexane is formed b) Ethanol is formed OR a) 1-chloropentane-more surface area of contact,vanderwaals force of attraction b) They are enantiomers	1+1 1+1
25.	a)Etards reaction- (Equations) b)Decarboxylation	2
26.	$4r = \sqrt{2}a \quad a = 2\sqrt{2}r = 2 \times 1.414 \times 127.8 = 361.4$ pm	½+1/2

	d = 4x 63.5 =8.94 g/cm^3 $(361.4)^3x10^{-30}$ x 6.02 $x10^{23}$	
27.	a) no d-d transitions b) Mn is in+2 oxidation state in MnO and +7 in Mn_2O_7 c) Due to ability of o to form multiple bonds OR a) Ce, oxidizing agent b) lanthanoid contraction, any one consequence.	3 ½+½ ½+½
28.	structure of : a) BrF_3 -T shaped b) Hypochlorous acid - c) XeF_2-Linear	1x3
29.	a) i. Hofmanns bromamide reaction ii. Reduction -$LiAlH_4$ b) $(CH_3)_3N$, $C_2H_5NH_2$, C_2H_5OH OR a) When treated with Hinsberg's reagent dimethylamine being a 2^0 amine gives N,N-dimethyl benzene sulphonamide which is insoluble in aqueous KOH solution while trimethyl amine being a 3^0 amine does not react with Hinsberg's reagent. b) But-2-en-2-amine c) electron donating nature of the amine group which increases the electron density on the benzene ring	1 1 1 1 1 1
30.	a) Anomers (Definitions) b) Native protein c) Nucleoside	1x3
31.	a) i. This is because the lone pairs on oxygen atom attached to hydrogen atom in the -COOH group are involved in resonance thereby making the carbon atom less electrophilic. ii. carboxylic group is strongly deactivating. $AlCl_3$ gets attached to COOH strongly	1x3

	iii. Acetic anhydride used to prevent oxidation of benzaldehyde to benzoic acid. b) i. By Aldol condensation ii. CH3MgBr&Oxdn OR a) i. CH3CONH2 ii. CHI3+RCOONa iii. RCHBrCOOH b) $C_6H_5COCH_3$, CH_3COCH_3, CH_3CHO c) $C_6H_5COCH_3$	1x2 1x3 1 1
32.	a) Cell constant-definition b) prevent electrolysis so that concentration of ions in the solution remains constant. c) $E°_{cell} = \frac{0\ 059}{2}$. log10 $E°_{cell}$ = 0.0295 V $[Zn^{2+}] = \frac{95}{100} \times 0.1 = 0.095$ M $\therefore \quad E_{Zn^{2+}/Zn} = -0.76 - \frac{0.0591}{2}\log\frac{1}{0.095}$ $= -0.76 - 0.02955\ (\log 1000 - \log 95)$ d) $= -0.76 - 0.0295\ (3 - 1.9777) = -0.79021$ V OR a) Kohlrauschs law b) Oxidation potential of Br-, H_2O,F- are in the following order.Br- > H_2O >F- $\Lambda_m = \frac{1\times1000}{200\times0.01}$ S cm^2 mol^{-1} c) 500 S cm^2 mol^{-1}	11/2 11/2 1 1 1 1

	$= \Lambda_m^0(NH_4Cl) + \Lambda_m^0(NaOH) - \Lambda_m^0(NaCl)$ $= 129.8 + 218.4 - 108.9$ $= 239.3 Scm^2 mol^{-1}$ $\alpha = \frac{\Lambda_m(NH_4OH)}{\Lambda_m^0(NH_4OH)}$ $= \frac{9.33}{239.3} = 0.039$ d)	
33.	a) i. OH bonds are stronger than SH bonds. ii. The products of hydrolysis are XeOF4 and XeO2 F2 where the oxidation states of all the elements remain the same b) i. $C_{12}H_{22}O_{11} + H_2SO_4 \rightarrow 12C + 11H_2O$ ii. $3Cu + 8\ HNO_3(dilute) \rightarrow 3Cu(NO_3)_2 + 2NO + 4H_2O$ iii. $2Ca(OH)_2 + 2Cl_2 \rightarrow Ca(OCl)_2 + CaCl_2 + 2H_2O$ OR a) i. $5NaCl + NaClO_3 + 3H_2O$ ii. XeF6 + O2 b) Decolourises acidified potassium permanganate solution; c) Due to the ease with which it liberates atoms of nascent oxygen d) it acts as a powerful oxidising agent	5