INDIAN SCHOOL MUSCAT

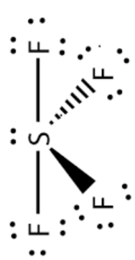
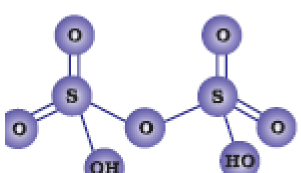
PRELIM 2

FEBRUARY 2019

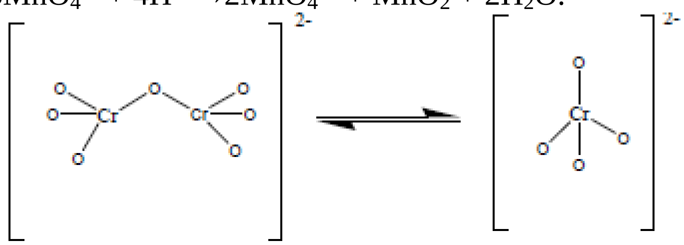
SET B

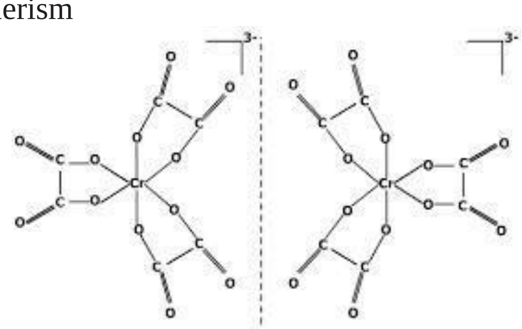
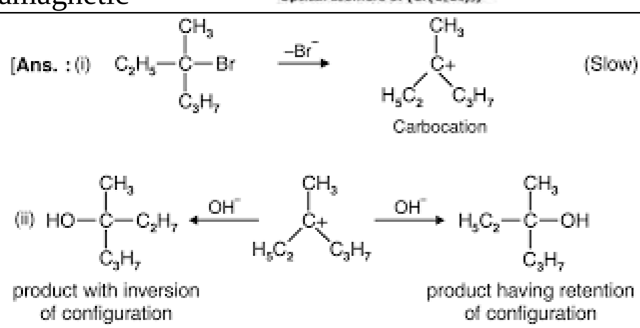
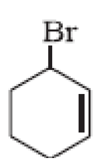
CLASS XII

Marking Scheme – CHEMISTRY [THEORY]

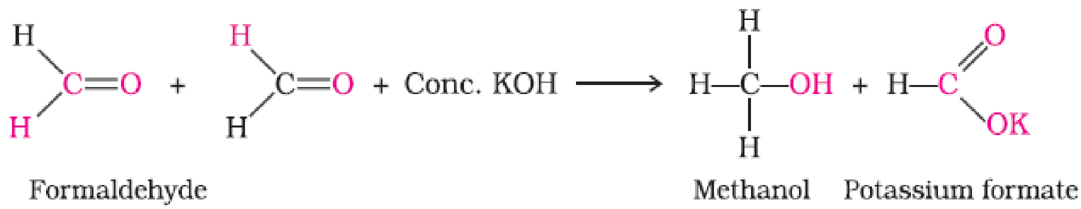
Q.NO.	Answers	
1.	Unidentate ligand with more than one donor atom,-CN	1
2.	3-Chloropropanamine, $CH_3CH(Cl)CH_2NH_2$	1
3.	Acetophenone + I_2 + NaOH(aq)→CHI_3 Iodoform (Yellow ppt) Benzophenone + I_2 + NaOH(aq) →No yellow ppt.of iodoform **OR** C_6H_5 –$COCH_3$ < CH_3 –$COCH_3$ < CH_3 –CHO	1
4.	$K_4[Fe(CN)_6]$	1
5.	Due to the presence of unpaired electrons in anion vacancy OR Glass is a Pseudo solid so behaves like fluid	1
6.	 a)  b)	1 1
7.	$4 FeCr_2O_4 + 8 Na_2CO_3 + 7 O_2 \rightarrow 8 Na_2CrO_4 + 2 Fe_2O_3 + 8 CO_2$ $2Na_2CrO_4 + 2 H^+ \rightarrow Na_2Cr_2O_7 + 2 Na^+ + H_2O$ $Na_2Cr_2O_7 + 2 KCl \rightarrow K_2Cr_2O_7 + 2 NaCl$	2
8.	a) $CH_3CH_2Cl + CH_3ONa \rightarrow CH_3CH_2OCH_3 + NaCl$	1

	b) $C_6H_5OH + CHCl_3 + 3KOH \rightarrow OH - C_6H_4 - CHO + 3KCl + 2H_2O$	1
9.	a) Definition Anoxia b) Ebullioscopic constant	
10.	a) Coagulating power of a coagulating ion is directly proportional to the charge on the ion b) Fe^{3+} ions has greater coagulating power than K^+ ions as Fe^{3+} has higher charge OR a) Charged smoke particles get attracted towards oppositely charged plate and gets coagulated b) physisorption involves van der wall attractive forces between adsorbent and adsorbed , This may result on the accumulation of many layers of the molecules on the surface. Chemisorption involves formation of chemical bonds between adsorbent and adsorbed molecule	1 1 1 1
11.	a) Catalytic process , the rate depends upon pore size of the catalyst and the shape & size of the reactant and products molecules b) Electric arc is struck between electrodes of the metal immersed in the dispersion medium.The intense heat produced vapourises the metal, which then condenses to form particles of colloidal size OR a) affects the activity of the iron catalyst, used in Haber's process b) extend to which gases are adsorbed is proportional to the critical temperature of gas. Higher the critical temperature, more is the gas adsorbed.	1 1 1 1
12.	a) Galvanic cells that are designed to convert the energy of combustion of fuels (methane, methanol, etc.) directly into electrical energy are called fuel cells. b) Molar conductivity of electrolyte at infinite dilution or when concentration approaches zero	1 1
13.	i=? n=2 α= i-1/n-1 i=1.8 π= iCRT = 4.4334atm	1 1 1
14.	a) Metals with low mp b) Zone refining c) oxygen liberates at anode and in presence of oxygen , graphite rod get consume to produce CO2	1 1 1
15.	d= Z x M / N o x a ^{3} 2.75 = Z x 119 / 6.022x 10 ^{23} x (654 x 10 $^{-10}$) Z= 4(fcc)	1 1 1
16.	a) Due to larger size of La^{3+} as compared to Lu^{3+}, it has a greater ionic character hence gives more no. of –OH ions	1

	b) because of large number of unpaired electrons in their atoms, they have stronger inter atomic interaction and hence strong metallic bonding is present between atoms c) Ce^{4+} tends to change Ce^{3+} by losing an electron ,+3 oxidation state is more stable. OR a) $5C_2O_4^{2-} + 2MnO_4^{-} + 16H^{+} \rightarrow 2Mn^{2+} + 8H_2O + 10CO_2$ b) $3MnO_4^{2-} + 4H^{+} \rightarrow 2MnO_4^{-} + MnO_2 + 2H_2O$. c)  pH < 7 pH > 7	1 1
17.	a) Methyl cyclohexene b) Butan-2 -ol is formed c) Phenol and Methyl iodide are formed	1 1 1
18.	a) Given $E^{o}Cell = +2.71V$ & $F = 96500C\ mol^{-1}$ n = 2 $\Delta rG^{O} = -n \times F \times E^{o}Cell$ $= -2 \times 96500 \times 2.71$ = -523030 J / mol or -523.030 kJ / mol b) $E_{H+/1/2H2} = 0 - 0.0591/1 \log 1/10^{-10}$ = - 0.591 V	1½ 1½
19.	• In primary structure specific sequence of amino acids are joined by covalent bonds. • secondary structure is responsible for the shape of a protein. α-helix and β-pleated in • which polypeptide chains have peptide linkages. • tertiary structure represents overall folding of polypeptide chain and give rise to the fibrous or globular molecular shape. OR a) Phosphodiester b) Absence of chiral carbon c) The H – Bond formed between the N-H group of each amino acid residue and COO- group of adjacent turn of α-helix helps in stabilizing the helix	1x3
20.	a) PHBV, Nylon2,Nylon 6 b) Elastomers c) Styrene	1x3

21.	a) the proteins which perform role of biological catalyst in the body. b) these are sodium salts of sulphonated long chain alcohols or hydrocarbons. Eg sodium lauryl sulphate. c) the chemical substances which are used to protect food against bacteria , yeast and moulds. OR a) antihistamine b) antiseptic c) antibiotics	1x3
22.	a) C_6H_6+N_2+HCl+CH_3CHO b) $(CH_3)_3N$ is more basic because greater number of alkyl groups increase the magnitude of +I effect so increase the basicity c) $FeCl_3$ get hydrolysed and HCl is produced so only small amount of HCl is needed just to initiate the reaction	1x3
23.	a) Potassium trioxalatochromate (III) b) Optical isomerism  Optical Isomers of $[Cr(C_2O_4)_3]^{3-}$ c) Paramagnetic	1 ½ 1 ½
24.	 OR a) $CH_3CH_2CBr(CH_3)_2$ b) $CH_3CH_2CH_2Cl$ c) 	3x1

25.	a) HOI< HOBr < HOCl b) (i) It decomposes to oxygen and nascent oxygen (ii) H2Te has less bond dissociation enthalpy than H2S . So, less energy is required to break H2Te bond & releasing [H]+ is easier c) (i) $PCl_3 + 3 H_2O \rightarrow H_3PO_3 + 3HCl$ (ii) $P_4 + 3KOH + 3H_2O \rightarrow KH_2PO_2 + PH_3$ OR $MnO_4^- + 8H^+ + 5e^- \rightarrow Mn^{+2} + 4H_2O$ X2 $SO_2 + 2H_2O \rightarrow SO_4^{2-} + 4H^+ + 2e^-$ x 5 $2 MnO_4^- + 5 SO_2 + 2 H_2O \rightarrow 2 Mn^{+2} + 5 SO_4^{2-} + 4 H^+$ $2 SO_2 + O_2 \xrightarrow{V_2O_5} 2SO_3$ A = Sulphur B = H_2S C = SO_2 D = SO_3	1 1 1 1 1 1x4 1/2+ 1/2
26.	a) (i) Zn-Hg +HCl (ii) *$SOCl_2$& H_2, Pd-$BaSO_4$* b) (i) –ve charge in carboxylate ion is dispersed on two more electronegative O-atoms. (ii) Due to presence of H-atom in acetaldehyde (iii)Due to more steric hindrance in 2,2,6- trimethyl cyclohexanone a) OR	1 1 1 1 1

	(i)  $RCN + SnCl_2 + HCl \longrightarrow RCH = NH \xrightarrow{H_3\overset{+}{O}} RCHO$ b) (i) PCC (ii) O3/Zn-H2O,Reduction (iii) Anhydrous AlCl3+C6H5COCl	1 1 1 1 1
27.	a) Representation of rate of a reaction in terms of concentration of reactants b) Time required to reduce the con to half of its initial concentration c) X=1 Y=2 Rate=k[A][B]^2 k= $\frac{6.0 \times 10^{-3}}{(0.1)(0.1)^2}$ = 6.0 $L^2mol^{-2}min^{-1}$ **OR** a) No of collisions per second per unit volume of the reaction mixture b) Rate=k $[NO]^2[H_2]$ c) $\text{Log}\frac{k2}{k1}=\frac{Ea}{2.303R}(\frac{1}{T1}-\frac{1}{T2})$ Log 2=Ea/19.137(1/300-1/310) Ea =53.6 kj/mol	1 1 1 1 1 1 1 1 1 1

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