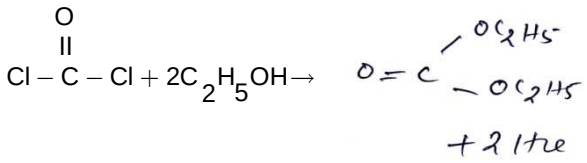
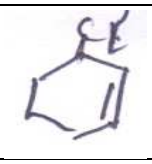
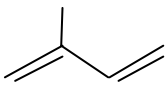
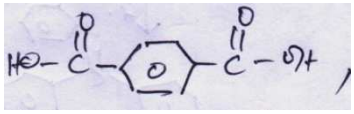
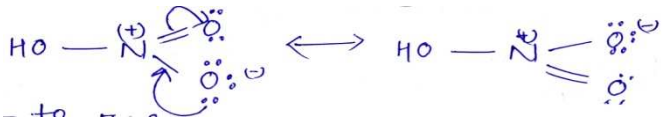
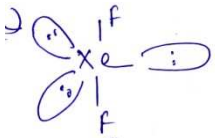
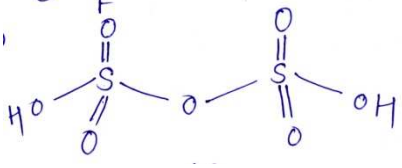
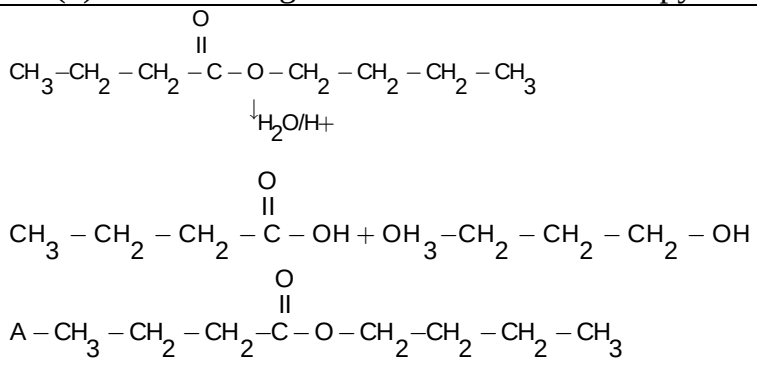
CLASS – XII

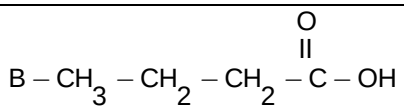
CHEMISTRY MARKING SCHEME -2017-18

Q.NO	ANSWER	MARK
1.	Correct definition	1
2.	Coagulation occur	1
3.	Correct IUPAC name	1
4.	Fehling solution A- $CuSO_4$. $5H_2O$ Fehling solution –B- sodium. potassium tartarate	½ ½
5.	More posisonic gas convented to less poisionic 	1
6.	0.05M $AI_2(SO_4)_3$ has higher freezing point 0.05M $AI_2(SO_4)_3$, i = 5 = 5 x 0.05=0.25 moles of ions $\triangle T_f$ α No of particles 0.1M $K_3[Fe(CN)_6]$, I = 4 4 x 0.1 = 0.4 moles of ions	1 ½ ½
7.	107.8g Ag deposited by = 96500C 1.078g Ag deposited by = 965C $t = \frac{Q}{I} = \frac{965}{2.5} = 386\ s$ 2 x96500C deposit Cu=63.5 g 965 C deposit Cu = 0.3175g **OR** $E^0_{cell} = 0.40V - (-0.74v) = +0.34\,V$ $\triangle_r G^0 = -nFE^0_{cell} = -6 \times 96500 \times 0.34 = -196.86\ KJ/mol$ $-\triangle_r G^0 = 2.303\ RT \log K$ $+196860 = 2.303 \times 8.314 \times 298 \log K$ $K = 3.192 \times 10^{34}$	½ ½ ½ ½ ½ ½ ½ ½
8.	(i) correct explanation (ii) correct explanation	1 1
9.	(i) Cr^{3+} -$3d^3$, half filled t_2g, so reducing Mn^{2+} - $3d^5$, half filled, so oxidizing (ii)$2KMnO_4 \xrightarrow{\triangle} K_2MnO_4 + MnO_2 + O_2$	½ ½ 1

10.	(i) 4-Bromo pent-2-ene (ii) Resonance stability of carbocation 	1 1
11.	(i) $P_1 = P_1^0 x_1 = 0.0925 \times 0.6 = 0.0555\,bar$ $P_2 = P_2^0 (1 - x_1) = 0.256 \times 0.4 = 0.1024$ bar $P_{Total} = P_1 + P_2 = 0.0555 + 0.1024$ $= 0.158$ bar (ii) mole fraction of toluene in vapour phase $= \frac{0.0555}{0.158} = 0.351$ Mole fraction of benzene in vapour phase $= \frac{0.1024}{0.158} = 0.648$	½ ½ ½ ½ ½ ½
12.	(i)a) cathode – $2H^+ + 2e^- \rightarrow H_2$ Anode – $OH^- \rightarrow OH + e^-$ $4OH \rightarrow 2H_2O + O_2$ (b) cathode – $Ag^+ + e^- \rightarrow Ag$ Anode $\rightarrow Ag \rightarrow Ag^+ + e^-$ (ii) HCl, H^+ size less than Na^+ and hence greater mobility	½ ½ ½ ½ ½+½
13.	(i) $K = \frac{2.303}{t} \log \frac{Po}{Pt} = \frac{2.303}{50} \log \frac{0.062}{0.044}$ $= 6.86 \times 10^{-3} S^{-1}$ (ii) $6.86 \times 10^{-3} = \frac{2.303}{100} \log \frac{0.062}{Pt}$ $Pt = 0.0312atm$	½+½ ½ 1 ½
14	(i) correct statement (ii) correct explanation (iii) correct explanation	1 1 1
15.	$4\,FeCr_2O_4 + 8\,Na_2CO_3 + 7O_2 \xrightarrow{\triangle} 8Na_2\,CrO_4 + 2Fe_2O_3 + 8CO_2$ $Na_2CrO_4 + 2H^+ \rightarrow Na_2Cr_2O_7 + 2Na^+ + H_2O$ $Na_2Cr_2O_7 + 2KCl \rightarrow K_2Cr_2O_7 + 2NaCl$ $K_2Cr_2O_7 \xrightarrow{IncreasePH} K_2CrO_4$ OR (i) Cr^{2+} (ii) Sc^{3+} (iii) Sc^{3+}	1 ½ ½ 1 1+1+1
16	(i) $Ni + 4CO \xrightarrow{330-350k} Ni(CO)_4$ $Ni(CO)_4 \xrightarrow{450-470K} Ni + 4CO$ (ii) Impurities are more soluble in the melt than in the solid state of the metal. (iii) To prevent one type of sulphide ore particles from forming froth with air bubbles.	½ ½ 1 1

17	(i) $+^{4}_{2g}\,eg^{0}$ (ii) Optical isomerism, correct structures (iii) Correct explanation, correct example	1 ½+½ ½+½
18.	(i) because C-O double bond character; so len available for protonation (ii) C-C bond stronger than C-N bond so, '$\bar{}$CN' (iv) So, halide exchange reaction can perfered from chloride / Bromide	1 1 1
19.	(i) $R-NH_2 + CHCl_3 + 3KOH_{(alc)} \xrightarrow{A} R-NC + 3KCl + 3H_2O$ (ii) HInsberg Reagent (a) Secondary amine $\xrightarrow{\text{hinsberg}}$ [complex] water soluble (b) Tentiary amine $\xrightarrow{\text{hinsberg}}$ complex] water insoluble (iv) Aniline < N-Methyl aniline < Methyl amine < dimethyl amine	1 ½ ½ 1
20.	(i) $CH_3-\underset{\underset{CH_3}{|}}{CH}-I + C_2H_5OH$ (ii) $CH_3-\underset{\underset{CH_2}{||}}{C}-CH_3 + H_2O$ (iii) $CH_3-\underset{\underset{CH_3}{|}}{\overset{\overset{C_2H_5}{|}}{C}}-CH_2-CH_3$ (carbocation shiffftng)	½ +½ ½ +½ 1
21.	a) Rubber  (Isopnene) b)  $\underset{\underset{OH}{|}}{CH_2}-\underset{\underset{OH}{|}}{CH_2}$ c) Must have functional group	½ +½ ½ +½ 1
22.	a) Intramolecular H-bond b) (i) water insoluble (i) water soluble (ii) 1, 4-glycosidic (ii) 1, 4 – glycosidic Linkage but 1, 6 – glycosidic linkage branch	1 1+1
23.	(i) Concern, caring (ii) barbitorate, appropriate function (iii) Chlordiazepoxide, meprobamate (iv) harmful effect	1 1 1 1
24.	(i) No of atoms = 0.5 x N_A = 3.011 x 10^{23} No of octahedral void = 3.011 x 10^{23} No of tetrahedral void = 6.022 x 10^{23} Total Void = 3.011 x 10^{23} + 6.022 x 10^{23} =9.033 x 10^{23} (ii) 1 mole of NaCl is doped with $SrCl_2$ $= \frac{10^{-3}}{100} = 10^{-5}$ mole Concentration of cation vacancies	½ ½ ½ ½ 1 1

	$= 10^{-5} \times 6.02 \times 10^{23} \quad = 6.02 \times 10^{18}\ mol^{-1}$	½+½
	OR	
	(i) $a^3 = \frac{M \times Z}{d \times N_0 \times 10^{-30}} = \frac{93 \times 2}{8.55 \times 6.02 \times 10^{23} \times 10^{-30}} = 36.1 \times 10^6$	½+½
	$a = 330.4\ pm$	½
	For BCC, $R = \frac{\sqrt{3}a}{4} = 0.433a$	½
	$= 0.433 \times 330.4$	½
	$= 143.1\ pm$	½
	(ii) Zns – frenkel defect	1
	AgBr – frenkel & Schottky defect	½+½
25.	(i) (a) $2PCl_5 \rightarrow [PCl_4]^+[PCl_6]^-$	1
	b) 	1
	Due to resonance N-0 bond has double bond character but N-OH has pure single bond character.	
	c) NH_3 – due to intermolecular H-bond	1
	ii)a) 	1
	b) 	1
	OR	
	(i) HClO	1
	(ii) Bi(v) stronger oxidizing agent +5 oxidation state of Bi less stable than +5 oxidation state of Sb due to inert pair effect	½+½
	(iii) Bsicity -2, pressure of two P-OH bond	½+½
	(iv) Atoms are held by weak vanderwaal force	1
	(v) Due to high bond dissociation enthalpy of N_2	1
26.		1



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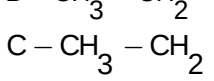

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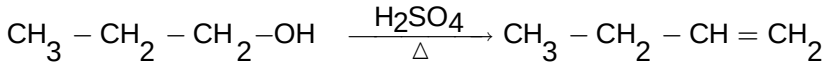
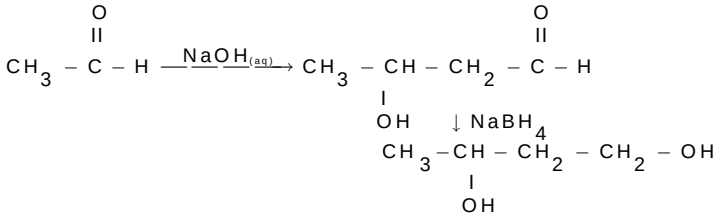


b)(i)



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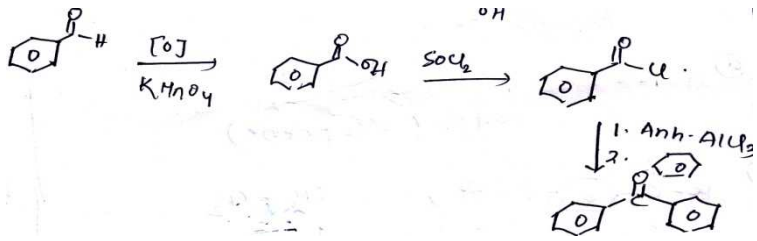
(ii)



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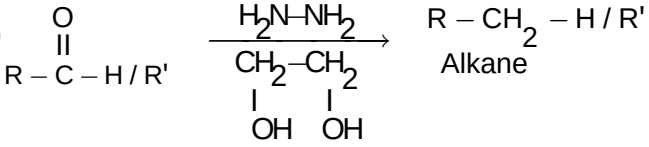
OR

(i)



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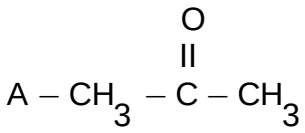
(ii)



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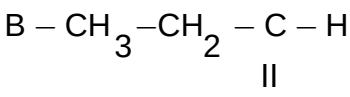

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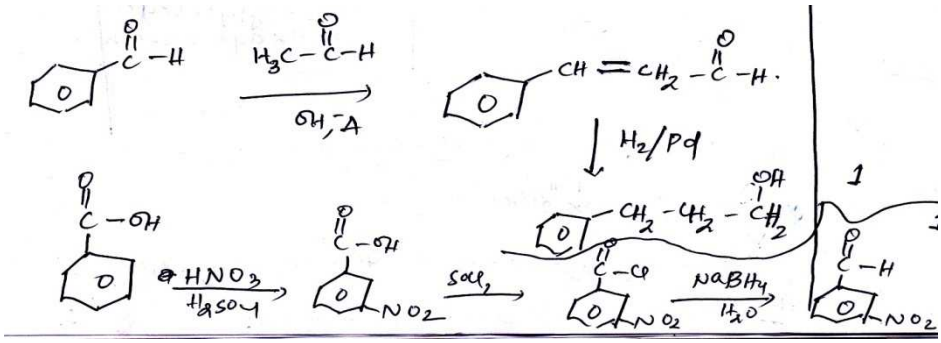
(iii)

(a)

(b)



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