CHEMISTRY MARKING SCHEME

SET -56/1/1

Qu es.	Value points	Marks
1	2	1
2	It is a process of removing a dissolved substance from a colloidal solution by means of diffusion through a suitable membrane.	1
3	Hexaamninenickel (II) chloride	1
4	CH ₃ - CH ₂ - CH - CH ₂ - CHO CH ₃	1
5	$ArN_2Cl + H_3PO_2 + H_2O \longrightarrow ArH + N_2 + H_3PO_3 + HCl$ (where Ar is C_6H_5)	1
6.	The external pressure which is applied on solution side to stop the flow of solvent across the semi-permeable membrane.	1
	The osmotic pressure is directly proportional to concentration of the solution. / π = CRT	1
7.	The half-life of a reaction is the time in which the concentration of a reactant is reduced to one-half of its initial concentration.	1
8.	Rate constant is the rate of reaction when the concentration of the reactant is unity.	1+1
	i) Ke	
9	Disproportionation: The reaction in which an element undergoes self-oxidation and self-	1
	reduction simultaneously. For example –	
	$2Cu^{+}(aq) \longrightarrow Cu^{2+}(aq) + Cu(s)$	1
	(Or any other correct equation)	
	OR	
9	i) Due to presence of unpaired electrons in d-orbitals.ii) Due to incomplete filling of d-orbitals.	1 1
10	· · · · · · · · · · · · · · · · · · ·	
	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1/2

	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1/2
	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	1
11	 i) The defect in which equal number of cations and anions are missing from the lattice. ii) Due to dislocation of smaller ion from its normal site to an interstitial site. iii) Anionic vacancies are occupied by unpaired electron. 	1 1 1
12	i) $\Delta T_f = K_f m$ $\Delta T_f = K_f \frac{w_B \times 1000}{M_B \times w_A}$	1/ ₂ 1/ ₂
	$\Delta T_f = \frac{1.86K \ kg \ mol^{-1} \ x \ 45g \ x \ 1000 \ g \ kg^{-1}}{60g mol^{-1} \ x \ 600 \ g}$ $\Delta T_f = 2.325K \ or \ 2.325^0 \ C$ ii) $T_f^0 - T_f = 2.325^0 \ C$ $O^0 C - T_f = 2.325^0 \ C$ $T_f = -2.325^0 \ C \ or \ 270.675 \ K$	1
13	$\log \frac{k_2}{k_1} = \frac{E_a}{2.303R} \left[\frac{T_2 - T_1}{T_1 T_2} \right]$	1
	$\log \frac{0.07}{0.02} = \left(\frac{E_{\rm a}}{2.303 \times 8.314 \text{J}K^{-1} \text{mol}^{-1}}\right) \left[\frac{700 - 500}{700 \times 500}\right]$	1
	$0.544 = E_a \times 5.714 \times 10^{-4}/19.15$ $E_a = 0.544 \times 19.15/5.714 \times 10^{-4} = 18230.8 \text{ J}$	1
14	i) The movement of colloidal particles under an applied electric potential towards oppositely charged electrode is called electrophoresis.	1 1
	ii) The accumulation of molecular species at the surface rather than in the bulk of a solid or liquid is termed adsorption.iii) The catalytic reaction that depends upon the pore structure of the catalyst and the size of the	1
	reactant and product molecules is called shape-selective catalysis.	
15	i) The impure metal is evaporated to obtain the pure metal as distillate.	1
	ii) This method is based on the principle that the impurities are more soluble in the melt than in the solid state of the metal.	1
	iii) The impure metal is made to act as anode. A strip of the same metal in pure form is used as cathode. They are put in a suitable electrolytic bath containing soluble salt of the same metal. The more basic metal remains in the solution and the less basic ones go to the anode mud. OR	1

15	$3\text{Fe}_2\text{O}_3 + \text{CO} \rightarrow 2\text{Fe}_3\text{O}_4 + \text{CO}_2$	½ x 4
	(Iron ore)	= 2
	$Fe_3O_4 + CO \rightarrow 3FeO + CO_2$	
	$CaCO_3 \rightarrow CaO + CO_2$	
	(Limestone)	
	$CaO + SiO_2 \rightarrow CaSiO_3$ (Slag)	
	$FeO + CO \rightarrow Fe + CO_2$	
	$C + CO_2 \rightarrow 2CO$	
	Coke	
	$C + O_2 \rightarrow CO_2$	
	FeO + C → Fe + CO (any four correct equations)	
	Cast iron has lower carbon content (about 3%) than pig iron / cast iron is hard & brittle whereas pig iron is soft.	1
16	The steady decrease in atomic radii from La to Lu due to imperfect shielding of 4f – orbital.	1
	Consequences – Nombous of third transition social have almost identical radii as corresponding membous	
	i) Members of third transition series have almost identical radii as coresponding members of second transition series.	
	ii) Difficulty in separation.	1+1
	n) Difficulty in Separation.	
17	a) Linkage isomerism	1
	b) Optical isomerism	1
	c) Cis - trans / Geometrical isomerism	1
18	a) Butan $-2 - 01$	1
	b) 2 – bromotoluene	1
10	c) 2, 2-dimethylchlorpropane i)	1
19		1
	$CH_3CH = CH_2 + H_2O \xrightarrow{H^+} CH_3 - CH - CH_3$	1
	ii) OH	
	ÇH ₂ Cl ÇH ₂ ONa ÇH ₂ OH	
	+ NaOH — H ⁺	1
	-HCI	1
	iii)	
	Br ₂ in	
	Ethanoic acid +	
	Anisole	1
20	Br	1
20	СООН	1/2 +
		1/2
	A – Benzoic acid	
	A – Benzoic acid	

	CONIL	
	CONH ₂	1/2 +
		1/2
	B – Benzamide	
	NH,	
	C - Aniline	1/2 +
		1/2
21	Fat soluble vitamin- Vitamin A, D	1/2+1/2
	Water soluble vitamin-Vitamin B,C	1/2+1/2
	Vitamin K	1
22	i)	1/2 +
	$CH_2 = CH - CH = CH_2$ and $C_6H_5CH=CH_2$	1/2
	1, 3-Butadiene Styrene	
	ii)	
	CI	1/2 +
	CH ₂ =C-CH=CH ₂	1/2
	Chloroprene /2-Chloro-1, 3-butadiene	
	• , = = = = = = = = = = = = = = = = = =	
	iii)	
	on on	1/2 +
	$CF_2 = CF_2$	1/2
	Tetrafluoroethene	
23	i) Aspartame, Saccharin (any one)	1
	ii) No	1
2.1	iii) Social concern, empathy, concern, social awareness (any 2)	2
24	a)i)Molar conductivity of a solution at a given concentration is the conductance of the volume <i>V</i>	1
	of solution containing one mole of electrolyte kept between two electrodes with area of cross	
	section A and distance of unit length.	
	ii) Secondary battery- can be recharged by passing current through it in opposite direction so that	1
	it can be used again. :::) Colvenie calls that are designed to convert the anarov of combustion of finals like hydrogen.	
	iii) Galvanic cells that are designed to convert the energy of combustion of fuels like hydrogen,	1
	methane, methanol, etc. directly into electrical energy are called fuel cells.	
	b)i) The amount of chemical reaction which occurs at any electrode during electrolysis by a	1
	current is proportional to the quantity of electricity passed through the electrolyte (solution or melt).	1
	ii) Limiting molar conductivity of an electrolyte can be represented as the sum of the individual	
	contributions of the anion and cation of the electrolyte.	1
	OR	
	VII.	

24	a) Degree of dissociation is the extent to which electrolyte gets dissociated into its constituent	1
27	ions.	1
	$\alpha = \frac{\Lambda_m}{\Lambda_m^{\circ}}$	
	$I_{\mathbf{m}}$	
	b) E^{0} cell = $E^{0}_{Ag+/Ag}$ - $E^{0}_{Ni2+/Ni}$ = $0.80V - 0.25V$	
	= 0.80 V - 0.23 V = 0.55 V	1/2
		1/2
	$\log K_{\rm c} = \left(\frac{nE^0 cell}{0.059}\right)$	
	$=\frac{2x0.55V}{0.059}$	1/2
	$\log K_c = 18.644$	1/2
	$\Delta G^0 = - nFE^0 cell$	/2
	$= -2x96500 \text{ Cmol}^{-1} \times 0.55\text{V}$	1
	$=-106,150 \text{ Jmol}^{-1}$	
	$Max.work = +106150 \text{ Jmol}^{-1} \text{ or } 106.150 \text{ Jmol}^{-1}$	
25	$_{\rm a)\ i)}$ 3Cu + 8 HNO ₃ (dilute) \rightarrow 3Cu(NO ₃) ₂ + 2NO + 4H ₂ O	1
	$_{ii)}P_4 + 3NaOH + 3H_2O \rightarrow PH_3 + 3NaH_2PO_2$	
	b) i) Due to absence of d-orbital, nitrogen cannot expand its valency beyond four.	1
	ii) Because of $p\pi - p\pi$ multiple bonding in dioxygen which is absent in sulphur.	1
	iii) Due to excitation of electron by absorption of radiation from visible region.	1
25	$\frac{OR}{a) i)} 2Ca(OH)_2 + 2Cl_2 \rightarrow Ca(OCl)_2 + CaCl_2 + 2H_2O$	1
		1
	$_{\rm ii)}$ C + 2H ₂ SO ₄ (conc.) \rightarrow CO ₂ + 2 SO ₂ + 2 H ₂ O	
	b) It is manufactured by Contact Process which involves following steps:	
	i) burning of sulphur or sulphide ores in air to generate SO ₂ .	
	ii) conversion of SO_2 to SO_3 by the reaction with oxygen in the presence of a catalyst (V_2O_5)	
	iii) absorption of SO_3 in H_2SO_4 to give <i>Oleum</i> ($H_2S_2O_7$). The oleum obtained is diluted to give	1
	sulphuric acid	1
	$2SO_2(g) + O_2(g) \xrightarrow{V_2O_5} 2SO_3(g)$	
	Reaction condition – pressure of 2 bar and temperature of 720 K	
	Catalyst used is V_2O_5	1
	Yield – 96 – 98% pure	
26	a) i) Carboxylic acids lose carbon dioxide to form hydrocarbons when their sodium salts are	1
	heated with sodalime (NaOH and CaO).	
	NaOH & CaO	
	$R-\frac{\text{COONa}}{\text{Heat}} \rightarrow R-H + \text{Na}_2\text{CO}_3$	
	ii) When the alkyl / acyl group is introduced at ortho and para positions by reaction	
	with alkyl halide / acyl halide in the presence of anhydrous aluminium chloride (a Lewis	
	acid) as catalyst.	

1 OCH, OCH, OCH₃ (Note: Award full marks if correct equation is given) b) i) COOH COCI CHO 1 H₂/Pd-BaSO₄ ii) NO₂ NO₂ 1 1 $CH_3CH_2OH \xrightarrow{CrO_3} CH_3-CHO \xrightarrow{\text{dil. NaOH}} CH_3-CH-CH_2-CHO$ (or any other correct method) OR i) When the acyl groups are introduced at ortho and para positions by reaction with acyl halide in the 1 26 presence of anhydrous aluminium chloride (a Lewis acid) as catalyst. + H_3C -C-Cl $\xrightarrow{Anhyd. AlCl_3}$ ii) Aldehydes and ketones having at least one ∝-hydrogen undergo a reaction in the presence of dilute alkali as catalyst to form \propto -hydroxy aldehydes (aldol) or \propto -hydroxy ketones (ketol), 1 respectively. $2 \text{ CH}_3\text{-}\overrightarrow{\text{CHO}} \xrightarrow{\text{dil. NaOH}} \text{CH}_3\text{-}\text{CH-CH}_2\text{-}\overrightarrow{\text{CHO}}$ (Note: Award full marks if correct equation is given) b)i) 1 ΟН

ii)	
O_2N_{\setminus}	
СНО	1
iii) CH₃COCI	1

CHEMISTRY MARKING SCHEME SET -56/1/2 Compt. July, 2015

Qu es.	Value points	Marks
1	It is a process of removing a dissolved substance from a colloidal solution by means of diffusion through a suitable membrane.	1
2	Hexaamninenickel (II) chloride	1
3	CH ₃ - CH ₂ - CH - CH ₂ - CHO CH ₃	1
4	$ArN_2Cl + H_3PO_2 + H_2O \longrightarrow ArH + N_2 + H_3PO_3 + HCl$ (where Ar is C_6H_5)	1
5	2	1
6	Disproportionation: The reaction in which an element undergoes self-oxidation and self-	1
	reduction simultaneously. For example – $2Cu^{+}(aq) \longrightarrow Cu^{2+}(aq) + Cu(s)$	1
	(Or any other correct equation)	
	OR	
6	i) Due to presence of unpaired electrons in d-orbitals.ii) Due to incomplete filling of d-orbitals.	1 1
7	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	1/2
	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1/2
	H - C = C + H $H - H$ $H + H$ $Ethene$ $H - C = C + H$ $H + H$	1
8	The external pressure which is applied on solution side to stop the flow of solvent across the semi-permeable membrane.	1
	The osmotic pressure is directly proportional to concentration of the solution. / π = CRT	1

9	The half-life of a reaction is the time in which the concentration of a reactant is reduced to one-	1
	half of its initial concentration.	
	Rate constant is the rate of reaction when the concentration of the reactant is unity.	1
10	i) F ii)	1+1
11	a) Linkage isomerism	1
	b) Optical isomerism	1
	c) Cis - trans / Geometrical isomerism	1
12	a) Butan -2 – ol	1
	b) 2 – bromotoluene	1
	c) 2, 2-dimethylchlorpropane	1
13	i) $CH_3CH = CH_2 + H_2O \xrightarrow{H^+} CH_3 - CH - CH_3$ OH	1
	CH ₂ Cl CH ₂ ONa CH ₂ OH H H OCH ₃ Br ₂ in Ethanoic acid Anisole	1
1.4	Br	
14	A – Benzoic acid CONH ₂	1/2 + 1/2
	B – Benzamide NH ₂	1/2 + 1/2
	C - Aniline	

15 Fat soluble vitamin-Vitamin B,C Water soluble vitamin-Vitamin B,C Vitamin K 16 i) CH ₂ = CH - CH = CH ₂ and C ₆ H ₆ CH=CH ₂ 1, 3-Butadiene Styrene ii) CI CH ₂ =C-CH=CH ₂ Chloroprene /2-Chloro-1, 3-butadiene iii) CF ₂ = CF ₂ Tetrafluoroethene 17 i) The defect in which equal number of cations and anions are missing from the lattice. ii) Due to dislocation of smaller ion from its normal site to an interstitial site. iii) Anionic vacancies are occupied by unpaired electron. 18 i) $\Delta T_f = K_f m$ $\Delta T_f = K_f m$ $\Delta T_f = K_f m$ $\Delta T_f = \frac{1.86K kg mol^{-1} x 45g x 1000 g kg^{-1}}{60gmol^{-1} x 600 g}$ $\Delta T_f = 2.325K$ or 2.325^0 C ii) $T_f^0 = T_f = 2.325^0$ C $T_f = -2.325^0$ C $T_f = -2.$	1/2 1/2+1/2 1/2+1/2 1 1/2 + 1/2 + 1/2 + 1/2 + 1/2 + 1/2 +
Water soluble vitamin-Vitamin B,C Vitamin K 16 i) $CH_2 = CH - CH = CH_2 \text{ and } C_6H_5CH=CH_2$ 1, 3-Butadiene Styrene ii) CI $CH_2 = C-CH=CH_2$ Chloroprene /2-Chloro-1, 3-butadiene iii) $CF_2 = CF_2$ Tetrafluoroethene 17 i) The defect in which equal number of cations and anions are missing from the lattice. ii) Due to dislocation of smaller ion from its normal site to an interstitial site. iii) Anionic vacancies are occupied by unpaired electron. 18 i) $\Delta T_f = K_f m$ $\Delta T_f = K_f \frac{W_B \times 1000}{M_B \times W_A}$ $\Delta T_f = \frac{1.86K kg mol^{-1} \times 45g \times 1000 g kg^{-1}}{60gmol^{-1} \times 600 g}$ $\Delta T_f = 2.325K \text{ or } 2.325^{\circ}C$ ii) $T_f^{\circ} - T_f = 2.325^{\circ}C$ $T_f = -2.325^{\circ}C \text{ or } 270.675 \text{ K}$	1/2+1/2 1 1/2 + 1/2 + 1/2 + 1/2 + 1/2 +
Vitamin K 16 i) CH₂ = CH − CH = CH₂ and C₀H₅CH=CH₂ 1, 3-Butadiene Styrene ii) CI CH₂=C-CH=CH₂ Chloroprene /2-Chloro-1, 3-butadiene iii) CF₂ = CF₂ Tetrafluoroethene iii) The defect in which equal number of cations and anions are missing from the lattice. ii) Due to dislocation of smaller ion from its normal site to an interstitial site. iii) Anionic vacancies are occupied by unpaired electron. 18 i) ΔT₂ = K₁ m₂ ΔT₂ = (1.86K kg mol⁻¹ x 45g x 1000 g kg⁻¹ 60gmol⁻¹ x 6000 g ΔT₂ = 2.325 N c 2.325 C ii) T₁° − T₁ = 2.325 C O°C − T₂ − 2.325 C	1 1/2 + 1/2 1/2 + 1/2 + 1/2 +
16 i) $CH_2 = CH - CH = CH_2 \text{ and } C_eH_5CH = CH_2$ 1, 3-Butadiene Styrene ii) CI $CH_2 = C-CH = CH_2$ $Chloroprene /2-Chloro-1, 3-butadiene$ iii) $CF_2 = CF_2$ $Tetrafluoroethene$ 17 i) The defect in which equal number of cations and anions are missing from the lattice. ii) Due to dislocation of smaller ion from its normal site to an interstitial site. iii) Anionic vacancies are occupied by unpaired electron. 18 i) $\Delta T_f = K_f \frac{w_B \times 1000}{M_B \times w_A}$ $\Delta T_f = \frac{1.86K kg mot^{-1} x 45g \times 1000 g kg^{-1}}{60gmot^{-1} x 600 g}$ $\Delta T_f = 2.325K \text{ or } 2.325^0C$ i) $T_f^0 - T_f = 2.325^0C$ $C^{0}C - T_f = 2.325^{0}C \text{ or } 270.675 \text{ K}$	1/2 + 1/2 + 1/2 + 1/2 + 1/2 +
$CH_2 = CH - CH = CH_2 \text{ and } C_eH_5CH = CH_2$ 1, 3-Butadiene Styrene ii) CI $CH_2 = C-CH = CH_2$ $Chloroprene /2-Chloro-1, 3-butadiene$ iii) $CF_2 = CF_2$ $Tetrafluoroethene$ 17 i) The defect in which equal number of cations and anions are missing from the lattice. ii) Due to dislocation of smaller ion from its normal site to an interstitial site. iii) Anionic vacancies are occupied by unpaired electron. 18 i) $\Delta T_f = K_f \frac{m}{M_B \times 1000}$ $\Delta T_f = K_f \frac{m}{M_B \times w_A}$ $\Delta T_f = \frac{1.86K kg mot^{-1} x 45g \times 1000 g kg^{-1}}{60gmot^{-1} x 600 g}$ $\Delta T_f = 2.325K \text{ or } 2.325^{\circ}C$ ii) T_f° $T_f = 2.325^{\circ}C$ $T_f = -2.325^{\circ}C \text{ or } 270.675 \text{ K}$	1/2 + 1/2 + 1/2 +
1, 3-Butadiene ii) Cl CH ₂ =C-CH=CH ₂ Chloroprene /2-Chloro-1, 3-butadiene iii) CF ₂ = CF ₂ Tetrafluoroethene 17 i) The defect in which equal number of cations and anions are missing from the lattice. ii) Due to dislocation of smaller ion from its normal site to an interstitial site. iii) Anionic vacancies are occupied by unpaired electron. 18 i) $\Delta T_f = K_f \frac{m}{M_B x 1000}$ $\Delta T_f = K_f \frac{m}{M_B x w_A}$ $\Delta T_f = \frac{1.86K kg mol^{-1} x 45g x 1000 g kg^{-1}}{60g mol^{-1} x 600 g}$ $\Delta T_f = 2.325K \text{ or } 2.325^0 \text{ C}$ ii) T_f^0 - $T_f = 2.325^0 \text{ C}$ $0^0 \text{ C} - T_f = 2.325^0 \text{ C}$ $T_f = -2.325^0 \text{ C} \text{ or } 270.675 \text{ K}$	1/2
ii) Cl CH ₂ =C-CH=CH ₂ Chloroprene /2-Chloro-1, 3-butadiene iii) CF ₂ = CF ₂ Tetrafluoroethene 17 i) The defect in which equal number of cations and anions are missing from the lattice. ii) Due to dislocation of smaller ion from its normal site to an interstitial site. iii) Anionic vacancies are occupied by unpaired electron. 18 i) $\Delta T_f = K_f \frac{m}{M_B x 1000}$ $\Delta T_f = K_f \frac{m_B x 1000}{60gmot^{-1} x 6000 g}$ $\Delta T_f = 2.325 \text{K or } 2.325^0 \text{ C}$ ii) $T_f^0 - T_f = 2.325^0 \text{ C}$ O $^0 \text{C} - T_f = 2.325^0 \text{ C}$ $T_f = -2.325^0 \text{ C}$ or 270.675 K	1/2
Cl CH ₂ =C-CH=CH ₂ Chloroprene /2-Chloro-1, 3-butadiene iii) CF ₂ = CF ₂ Tetrafluoroethene 17 i) The defect in which equal number of cations and anions are missing from the lattice. ii) Due to dislocation of smaller ion from its normal site to an interstitial site. iii) Anionic vacancies are occupied by unpaired electron. 18 i) $\Delta T_f = K_f m$ $\Delta T_f = K_f \frac{W_B \times 1000}{M_B \times W_A}$ $\Delta T_f = \frac{1.86K kg mol^{-1} x 45g x 1000 g kg^{-1}}{60gmol^{-1} x 600 g}$ $\Delta T_f = 2.325K$ or 2.325^0 C ii) T_f^0 - $T_f = 2.325^0$ C $T_f = -2.325^0$ C or $T_f = 2.325^0$ C $T_f = -2.325^0$ C or $T_f = -2.325^0$ C	1/2
Chloroprene /2-Chloro-1, 3-butadiene iii) $CF_2 = CF_2$ Tetrafluoroethene 17 i) The defect in which equal number of cations and anions are missing from the lattice. ii) Due to dislocation of smaller ion from its normal site to an interstitial site. iii) Anionic vacancies are occupied by unpaired electron. 18 i) $\Delta T_f = K_f m$ $\Delta T_f = K_f \frac{w_B \times 1000}{M_B \times w_A}$ $\Delta T_f = \frac{1.86K kg mol^{-1} \times 45g \times 1000 g kg^{-1}}{60gmol^{-1} \times 600 g}$ $\Delta T_f = 2.325K \text{ or } 2.325^{\circ}C$ ii) $T_f^{\circ} - T_f = 2.325^{\circ}C$ $T_f = -2.325^{\circ}C \text{ or } 270.675 \text{ K}$	1/2
Chloroprene /2-Chloro-1, 3-butadiene iii) $CF_2 = CF_2$ Tetrafluoroethene 17 i) The defect in which equal number of cations and anions are missing from the lattice. ii) Due to dislocation of smaller ion from its normal site to an interstitial site. iii) Anionic vacancies are occupied by unpaired electron. 18 i) $\Delta T_f = K_f m$ $\Delta T_f = K_f \frac{w_B \times 1000}{M_B \times w_A}$ $\Delta T_f = \frac{1.86K kg mol^{-1} \times 45g \times 1000 g kg^{-1}}{60gmol^{-1} \times 600 g}$ $\Delta T_f = 2.325K \text{ or } 2.325^{\circ}C$ ii) $T_f^{\circ} - T_f = 2.325^{\circ}C$ $T_f = -2.325^{\circ}C \text{ or } 270.675 \text{ K}$	1/2 +
Chloroprene /2-Chloro-1, 3-butadiene iii) $CF_2 = CF_2$ Tetrafluoroethene 17 i) The defect in which equal number of cations and anions are missing from the lattice. ii) Due to dislocation of smaller ion from its normal site to an interstitial site. iii) Anionic vacancies are occupied by unpaired electron. 18 i) $\Delta T_f = K_f m$ $\Delta T_f = K_f \frac{w_B \times 1000}{M_B \times w_A}$ $\Delta T_f = \frac{1.86K kg mol^{-1} \times 45g \times 1000 g kg^{-1}}{60gmol^{-1} \times 600 g}$ $\Delta T_f = 2.325K \text{ or } 2.325^{\circ}C$ ii) $T_f^{\circ} - T_f = 2.325^{\circ}C$ $T_f = -2.325^{\circ}C \text{ or } 270.675 \text{ K}$	
$ \textbf{CF_2} = \textbf{CF_2} $ $ \textbf{Tetrafluoroethene} $ 17 i) The defect in which equal number of cations and anions are missing from the lattice. ii) Due to dislocation of smaller ion from its normal site to an interstitial site. iii) Anionic vacancies are occupied by unpaired electron. $ \textbf{18} \textbf{i)} \Delta T_f = \textbf{K}_f \textbf{m} \\ \Delta T_f = \textbf{K}_f \frac{\textbf{w}_B \textbf{x} 1000}{\textbf{M}_B \textbf{x} \textbf{w}_A} $ $ \Delta T_f = \frac{1.86K kg mol^{-1} \textbf{x} 45g \textbf{x} 1000 g kg^{-1}}{60g mol^{-1} \textbf{x} 600 g} $ $ \Delta T_f = 2.325K \text{or} 2.325^0 \text{C} $ $ \textbf{ii)} T_f^0 - T_f = 2.325^0 \text{C} $ $ \textbf{O}^0 \textbf{C} - T_f = 2.325^0 \textbf{C} $ $ \textbf{O}^0 \textbf{C} - T_f = 2.325^0 \textbf{C} $ $ \textbf{O}^0 \textbf{C} - T_f = 2.325^0 \textbf{C} $ $ \textbf{O}^0 \textbf{C} - T_f = 2.325^0 \textbf{C} $	
Tetrafluoroethene 17 i) The defect in which equal number of cations and anions are missing from the lattice. ii) Due to dislocation of smaller ion from its normal site to an interstitial site. iii) Anionic vacancies are occupied by unpaired electron. 18 i) $\Delta T_f = K_f m$ $\Delta T_f = K_f \frac{w_B \times 1000}{M_B \times w_A}$ $\Delta T_f = \frac{1.86K \ kg \ mol^{-1} \times 45g \times 1000 \ g \ kg^{-1}}{60g mol^{-1} \times 600 \ g}$ $\Delta T_f = 2.325K \text{ or } 2.325^0 \text{ C}$ $\text{ii) } T_f^0 - T_f = 2.325^0 \text{ C}$ $C^0 - T_f = 2.325^0 \text{ C}$ $T_f = -2.325^0 \text{ C}$	
Tetrafluoroethene 17 i) The defect in which equal number of cations and anions are missing from the lattice. ii) Due to dislocation of smaller ion from its normal site to an interstitial site. iii) Anionic vacancies are occupied by unpaired electron. 18 i) $\Delta T_f = K_f m$ $\Delta T_f = K_f \frac{w_B \times 1000}{M_B \times w_A}$ $\Delta T_f = \frac{1.86K \ kg \ mol^{-1} \times 45g \times 1000 \ g \ kg^{-1}}{60g mol^{-1} \times 600 \ g}$ $\Delta T_f = 2.325K \text{ or } 2.325^0 \text{ C}$ $\text{ii) } T_f^0 - T_f = 2.325^0 \text{ C}$ $C^0 - T_f = 2.325^0 \text{ C}$ $T_f = -2.325^0 \text{ C}$	
Tetrafluoroethene i) The defect in which equal number of cations and anions are missing from the lattice. ii) Due to dislocation of smaller ion from its normal site to an interstitial site. iii) Anionic vacancies are occupied by unpaired electron. i) $\Delta T_f = K_f m$ $\Delta T_f = K_f \frac{w_B \times 1000}{M_B \times w_A}$ $\Delta T_f = \frac{1.86K \ kg \ mol^{-1} \ x \ 45g \ x \ 1000 \ g \ kg^{-1}}{60g mol^{-1} \ x \ 600 \ g}$ $\Delta T_f = 2.325K \ or \ 2.325^0 C$ ii) $T_f^0 - T_f = 2.325^0 C$ $T_f = -2.325^0 C \ or \ 270.675 \ K$	1/2
17 i) The defect in which equal number of cations and anions are missing from the lattice. ii) Due to dislocation of smaller ion from its normal site to an interstitial site. iii) Anionic vacancies are occupied by unpaired electron. 18 i) $\Delta T_f = K_f m$ $\Delta T_f = K_f \frac{w_B \times 1000}{M_B \times w_A}$ $\Delta T_f = \frac{1.86K \ kg \ mol^{-1} \ x \ 45g \ x \ 1000 \ g \ kg^{-1}}{60g mol^{-1} \ x \ 600 \ g}$ $\Delta T_f = 2.325K \ \text{or} \ 2.325^0 \ \text{C}$ ii) $T_f^0 - T_f = 2.325^0 \ \text{C}$ $T_f = -2.325^0 \ \text{C}$ $T_f = -2.325^0 \ \text{C}$ $T_f = -2.325^0 \ \text{C}$	1
17 i) The defect in which equal number of cations and anions are missing from the lattice. ii) Due to dislocation of smaller ion from its normal site to an interstitial site. iii) Anionic vacancies are occupied by unpaired electron. 18 i) $\Delta T_f = K_f m$ $\Delta T_f = K_f \frac{w_B \times 1000}{M_B \times w_A}$ $\Delta T_f = \frac{1.86K \ kg \ mol^{-1} \ x \ 45g \ x \ 1000 \ g \ kg^{-1}}{60g mol^{-1} \ x \ 600 \ g}$ $\Delta T_f = 2.325K \ \text{or} \ 2.325^0 \ \text{C}$ ii) $T_f^0 - T_f = 2.325^0 \ \text{C}$ $T_f = -2.325^0 \ \text{C} $ or $270.675 \ \text{K}$	
ii) Due to dislocation of smaller ion from its normal site to an interstitial site. iii) Anionic vacancies are occupied by unpaired electron. 18 i) $\Delta T_f = K_f m$ $\Delta T_f = K_f \frac{w_B \times 1000}{M_B \times w_A}$ $\Delta T_f = \frac{1.86K \ kg \ mol^{-1} \ x \ 45g \ x \ 1000 \ g \ kg^{-1}}{60g mol^{-1} \ x \ 600 \ g}$ $\Delta T_f = 2.325K \ or \ 2.325^0 \ C$ ii) $T_f^0 - T_f = 2.325^0 \ C$ $O^0 C - T_f = 2.325^0 \ C$ $T_f = -2.325^0 \ C \ or \ 270.675 \ K$	
$\begin{array}{c} \text{iii)} \qquad \text{Anionic vacancies are occupied by unpaired electron.} \\ 18 \text{i)} \Delta T_f = K_f m \\ \Delta T_f = K_f \frac{w_B x 1000}{M_B x w_A} \\ \\ \Delta T_f = \frac{1.86K kg mol^{-1} x 45g x 1000 g kg^{-1}}{60g mol^{-1} x 600 g} \\ \Delta T_f = 2.325K \text{ or } 2.325^0 \text{C} \\ \text{ii)} T_f^0 - T_f = 2.325^0 \text{C} \\ O^0 \text{C} - T_f = 2.325^0 \text{C} \\ T_f = -2.325^0 \text{C} \text{or } 270.675 \text{ K} \\ \\ \end{array}$	1 1
$ \begin{array}{c} \text{18} & \text{i)} \ \Delta T_f = K_f m \\ \Delta T_f = K_f \frac{w_B x 1000}{M_B x w_A} \\ \\ \Delta T_f = \frac{1.86 K kg mol^{-1} x 45g x 1000 g kg^{-1}}{60g mol^{-1} x 600 g} \\ \Delta T_f = 2.325 K \text{ or } 2.325^0 \text{C} \\ \text{ii)} \ T_f^0 - T_f = 2.325^0 \text{C} \\ O^0 \text{C} - T_f = 2.325^0 \text{C} \\ T_f = -2.325^0 \text{C} & \text{or } 270.675 \text{ K} \\ \end{array} $	1
$\Delta T_{\rm f} = \frac{1.86 K kg mol^{-1} x 45g x 1000 g kg^{-1}}{60g mol^{-1} x 600 g}$ $\Delta T_{\rm f} = 2.325 K \text{ or } 2.325^{0} \text{C}$ ii) $T_{\rm f}^{ 0}$ - $T_{\rm f} = 2.325^{ 0} \text{C}$ $O^{ 0} \text{C} - T_{\rm f} = 2.325^{ 0} \text{C}$ $T_{\rm f} = -2.325^{ 0} \text{C} \text{ or } 270.675 \text{ K}$	1/2
$\Delta T_{\rm f} = \frac{1.86 K kg mol^{-1} x 45g x 1000 g kg^{-1}}{60g mol^{-1} x 600 g}$ $\Delta T_{\rm f} = 2.325 K \text{ or } 2.325^{0} \text{C}$ ii) $T_{\rm f}^{ 0}$ - $T_{\rm f} = 2.325^{ 0} \text{C}$ $O^{ 0} \text{C} - T_{\rm f} = 2.325^{ 0} \text{C}$ $T_{\rm f} = -2.325^{ 0} \text{C} \text{ or } 270.675 \text{ K}$	1/2
ii) T_f^0 - $T_f = 2.325^0$ C O^0 C - $T_f = 2.325^0$ C $T_f = -2.325^0$ C or 270.675 K	
ii) T_f^0 - $T_f = 2.325^0$ C O^0 C - $T_f = 2.325^0$ C $T_f = -2.325^0$ C or 270.675 K	
ii) T_f^0 - $T_f = 2.325^0$ C O^0 C - $T_f = 2.325^0$ C $T_f = -2.325^0$ C or 270.675 K	1
$O^{0}C - T_{f} = 2.325^{0}C$ $T_{f} = -2.325^{0}C$ or 270.675 K	
$T_f = -2.325^{\circ} \text{ C}$ or 270.675 K	
19 $E_a \Gamma_2 - \Gamma_1$	1
k_2 E_a $T_2 - T_1$	1
log	1
$k_1 = 2.303R \lfloor T_1T_2 \rfloor$	
0.07 (E.)[700 - 500]	1
$\log \frac{0.07}{0.02} = \left(\frac{E_{\rm a}}{2.303 \times 8.314 \text{JK}^{-1} \text{mol}^{-1}} \right) \left[\frac{700 - 500}{700 \times 500} \right]$	
$0.544 = E_{\rm a} \times 5.714 \times 10^{-4}/19.15$	1
$E_{\rm a} = 0.544 \times 19.15/5.714 \times 10^{-4} = 18230.8 \text{ J}$	1 1
i) The movement of colloidal particles under an applied electric potential towards oppositely	1
charged electrode is called electrophoresis.	1
ii) The accumulation of molecular species at the surface rather than in the bulk of a solid or liquid is termed adsorption.	
iii) The catalytic reaction that depends upon the pore structure of the catalyst and the size of the	1 1
reactant and product molecules is called shape-selective catalysis.	1

$\begin{vmatrix} 1 \\ 1 \end{vmatrix}$
1
½ x 4
= 2
1
1
1
1+1
1
1
2
1
1
1
1
1
1
1
1
1

	V' 11 07 000	I
-	Yield - 96 - 98% pure	1
25	 a) i) Carboxylic acids lose carbon dioxide to form hydrocarbons when their sodium salts are heated with sodalime (NaOH and CaO). 	1
	R-COONa NaOH & CaO Heat R-H + Na ₂ CO ₃	
	ii) When the alkyl / acyl group is introduced at ortho and para positions by reaction with alkyl halide / acyl halide in the presence of anhydrous aluminium chloride (a Lewis acid) as catalyst.	
	OCH ₃ OCH ₃ OCH ₃ CH ₃ +CH ₃ Cl Anhyd. AlCl ₃ +	
	(Note: Award full marks if correct equation is given)	1
	b) i)	
	COOH COCI CHO	
	$ \begin{array}{c} & PCl_5 \\ \hline & H_2/Pd-BaSO_4 \end{array} $	
	ii)	1
	NO ₂ NO ₂	
	HNO ₃ / H2SO ₄ CH ₃ COCI / AICI ₃ COCH ₃	
	iii)	1
	$CH_3CH_2OH \xrightarrow{CrO_3} CH_3-CHO \xrightarrow{dil. NaOH} CH_3-CH-CH_2-CHO$	
	OH	
	(or any other correct method) OR	1
25	 a) i) When the acyl groups are introduced at ortho and para positions by reaction with acyl halide in the presence of anhydrous aluminium chloride (a Lewis acid) as catalyst. 	1
	Cl Cl Cl	
	+ H ₃ C-C-Cl Anhyd. AlCl ₃ + CH ₃ +	
	O [™] CH ₃	
	ii) Aldehydes and ketones having at least one \propto -hydrogen undergo a reaction in the presence of dilute alkali as catalyst to form \propto -hydroxy aldehydes (aldol) or \propto -hydroxy ketones (ketol), respectively.	1

	dil. NaOH	
	2 CH ₃ -CHO ← CH ₃ -CH-CH ₂ -CHO	
	OH	
	(Note: Award full marks if correct equation is given)	
	(
	b)i)	1
	$CH_3 - CH - CH_3$	
	ОН	
	ii)	
	O_2N_{χ}	
)\	1
	⟨	
		1
	iii) CH ₃ COCI	
26	a)i)Molar conductivity of a solution at a given concentration is the conductance of the volume V	1
	of solution containing one mole of electrolyte kept between two electrodes with area of cross	
	section A and distance of unit length.	
	ii) Secondary battery- can be recharged by passing current through it in opposite direction so that	1
	it can be used again.	
	iii) Galvanic cells that are designed to convert the energy of combustion of fuels like hydrogen,	1
	methane, methanol, etc. directly into electrical energy are called fuel cells.	
	b)i) The amount of chemical reaction which occurs at any electrode during electrolysis by a	1
	current is proportional to the quantity of electricity passed through the electrolyte (solution or	1
	melt).	
	ii) Limiting molar conductivity of an electrolyte can be represented as the sum of the individual	1
	contributions of the anion and cation of the electrolyte.	
26	OR a) Degree of dissociation is the extent to which electrolyte gots dissociated into its constituent	1
26	a) Degree of dissociation is the extent to which electrolyte gets dissociated into its constituent ions.	$\begin{bmatrix} 1 \\ 1 \end{bmatrix}$
	A	
	$\alpha = \frac{m}{\Lambda^{\circ}}$	
	b) $E^0 \text{cell} = E^0_{\text{Ag+/Ag}} - E^0_{\text{Ni2+/Ni}}$	
	= 0.80V - 0.25V	1/2
	= 0.55V	1/ ₂ 1/ ₂
	$\log K_{c} = \left(\frac{nE^{0}cell}{0.059}\right)$	/ 2
	$=\frac{2x0.55V}{0.059}$	
	$\log K_c = 18.644$	1/2
	$\Delta G^0 = -nFE^0$ cell	1/2
	$= -2x96500 \text{ Cmol}^{-1} \times 0.55\text{V}$	1
	$= -106,150 \text{ Jmol}^{-1}$	1
	$Max.work = +106150 \text{ Jmol}^{-1} \text{ or } 106.150 \text{ Jmol}^{-1}$	

Dr. Sangeeta Bhatia

Sh. S.K. Munjal

Sh. D.A. Mishra

Ms. Garima Bhutani

CHEMISTRY MARKING SCHEME SET -56/1/3 Compt. July, 2015

Qu es.	Value points	Marks
1	Hexaamninenickel (II) chloride	1
2	CH ₃ - CH ₂ - CH - CH ₂ - CHO CH ₃	1
3	$ArN_2Cl + H_3PO_2 + H_2O \longrightarrow ArH + N_2 + H_3PO_3 + HCl$ (where Ar is C_6H_5)	1
4	2	1
5	It is a process of removing a dissolved substance from a colloidal solution by means of diffusion through a suitable membrane.	1
6	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	1/2
	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1/2
	H - C = C + H $H - H + H$ $Ethene$ $H - H + H$ $H - H + H$	1
7	The external pressure which is applied on solution side to stop the flow of solvent across the semi-permeable membrane.	1
	The osmotic pressure is directly proportional to concentration of the solution. / π = CRT	1
8	The half-life of a reaction is the time in which the concentration of a reactant is reduced to one-half of its initial concentration.	1
	Rate constant is the rate of reaction when the concentration of the reactant is unity.	1

9	_	1+1
	P	
	S Xe	
	но	
i	i) ii) F	
	Disproportionation: The reaction in which an element undergoes self-oxidation and self-	1
	reduction simultaneously. For example –	
	$2Cu^{+}(aq) \longrightarrow Cu^{2+}(aq) + Cu(s)$	1
((Or any other correct equation)	
	OR	
10	i) Due to presence of unpaired electrons in d-orbitals.ii) Due to incomplete filling of d-orbitals.	1
11	i)	
	$CH_3CH = CH_2 + H_2O \stackrel{H^+}{\longleftrightarrow} CH_3 - CH - CH_3$	1
	OH	
	n)	
	CH ₂ CI CH ₂ ONa CH ₂ OH	
	H ⁺	
	+ NaOH — HCI	1
	iii)	
	OCH ₃ OCH ₃	
	Br ₂ in	
	Ethanoic acid +	
	Anisole Br	1
12	СООН	1/2 + 1/2
		/ 2
	A – Benzoic acid	
	CONH ₂	1/
		1/2 + 1/2
]	B – Benzamide	
1		1

	AVV	1/2 +
	NH ₂	1/2
12	C - Aniline	1/ +1/
13	Fat soluble vitamin- Vitamin A, D Water soluble vitamin-Vitamin B,C	$\frac{1}{2} + \frac{1}{2}$ $\frac{1}{2} + \frac{1}{2}$
	Vitamin K	1
14	i)	1/2 +
	OH - OH - OH - OH and OH-OH	1/2
	$CH_2 = CH - CH = CH_2$ and $C_6H_5CH=CH_2$	
	1, 3-Butadiene Styrene	
	ii)	
	Cl	1/2 +
	CH ₂ =C-CH=CH ₂	1/2
	Chloroprene /2-Chloro-1, 3-butadiene	
	iii)	1/2 +
	$CF_2 = CF_2$	1/2
	Tetrafluoroethene	
15	i) The defect in which equal number of cations and anions are missing from the lattice.	1
	ii) Due to dislocation of smaller ion from its normal site to an interstitial site.	1
16	iii) Anionic vacancies are occupied by unpaired electron. i) $\Delta T_f = K_f m$	1/2
10	$\Delta T_f = K_f \frac{W_B \times 1000}{M_B \times W_A}$	1/2
	$\Delta 1_{f} - \mathbf{K}_{f} \frac{\mathbf{M}_{B} \mathbf{x} \mathbf{w}_{A}}{\mathbf{M}_{B} \mathbf{x} \mathbf{w}_{A}}$, -
	$_{A.T.}$ _ 1.86K kg mol ⁻¹ x 45g x 1000 g kg ⁻¹	
	$\Delta T_{\rm f} = \frac{1.86 k \ kg \ mol^{-1} \ x \ 45g \ x \ 1000 \ g \ kg^{-1}}{60g mol^{-1} \ x \ 600 \ g}$ $\Delta T_{\rm f} = 2.325 \text{K or } 2.325^{0} \text{C}$	1
	$\Delta T_f = 2.325 \text{K}$ or 2.325°C	1
	ii) $T_f^0 - T_f = 2.325^0 C$	
	$O^{0}C - T_{f} = 2.325^{0}C$ $T_{f} = -2.325^{0}C$ or 270.675 K	1
	11 - 2.323 C 01 270.073 K	
17	$E_a = \begin{bmatrix} T_2 - T_1 \end{bmatrix}$	1
	$\log \frac{k_2}{k_1} = \frac{E_a}{2.303R} \left[\frac{T_2 - T_1}{T_1 T_2} \right]$	
		1
	$\log \frac{0.07}{0.02} = \left(\frac{E_{\rm a}}{2.303 \times 8.314 \text{JK}^{-1} \text{mol}^{-1}} \right) \left[\frac{700 - 500}{700 \times 500} \right]$	1
	$0.02 - (2.303 \times 8.314 \text{JK}^{-1} \text{mol}^{-1})[700 \times 500]$	
	$0.544 = E_a \times 5.714 \times 10^{-4}/19.15$	
	$E_{\rm a} = 0.544 \times 19.15/5.714 \times 10^{-4} = 18230.8 \text{ J}$	1
18	i) The movement of colloidal particles under an applied electric potential towards oppositely	1
	charged electrode is called electrophoresis.	1
1	ii) The accumulation of molecular species at the surface rather than in the bulk of a solid or liquid	

		Т.
	is termed adsorption.	1
	iii) The catalytic reaction that depends upon the pore structure of the catalyst and the size of the	
	reactant and product molecules is called shape-selective catalysis.	
19	i) The impure metal is evaporated to obtain the pure metal as distillate.	1
	ii) This method is based on the principle that the impurities are more soluble in the melt than in	1
	the solid state of the metal.	
	iii) The impure metal is made to act as anode. A strip of the same metal in pure form is used as	
	cathode. They are put in a suitable electrolytic bath containing soluble salt of the same metal.	1
	The more basic metal remains in the solution and the less basic ones go to the anode mud.	
	OR	
19	$3Fe_2O_3 + CO \rightarrow 2Fe_3O_4 + CO_2$	½ x 4
	(Iron ore)	= 2
	$Fe_3O_4 + CO \rightarrow 3FeO + CO_2$	
	$CaCO_3 \rightarrow CaO + CO_2$	
	(Limestone)	
	CaO + SiO₂ → CaSiO₃	
	(Slag)	
	$FeO + CO \rightarrow Fe + CO_2$	
	$C + CO_2 \rightarrow 2CO$	
	Coke	
	$C + O_2 \rightarrow CO_2$	
	$FeO + C \rightarrow Fe + CO$ (any four correct equations)	
	(any four correct equations) Cast iron has lower carbon content (about 3%) than pig iron / cast iron is hard & brittle whereas	
	pig iron is soft.	1
20	The steady decrease in atomic radii from La to Lu due to imperfect shielding of 4f – orbital.	1
	Consequences –	
	i) Members of third transition series have almost identical radii as coresponding members	
	of second transition series.	
	ii) Difficulty in separation.	1+1
21	a) Linkage isomerism	1
	b) Optical isomerism	1
	c) Cis - trans / Geometrical isomerism	1
22	a) Butan – 2 – ol	1
	b) 2 – bromotoluene	1
	c) 2, 2-dimethylchlorpropane	1
23	i) Aspartame, Saccharin (any one)	1
	ii) No	1
	iii) Social concern, empathy, concern, social awareness (any 2)	2
24	a) i) Carboxylic acids lose carbon dioxide to form hydrocarbons when their sodium salts are	1
	heated with sodalime (NaOH and CaO).	
	NaOH & CaO	
	$R-COONa \longrightarrow R-H + Na_{1}CO_{2}$	
	Heat	
	ii) When the alkyl / acyl group is introduced at ortho and para positions by reaction	
	with alkyl halide / acyl halide in the presence of anhydrous aluminium chloride (a Lewis	
	acid) as catalyst.	

		1
	ii)	
	O_2N_{s}	
	> ─\	
	⟨ ⟨ ⟨	1
	iii) CH ₃ COCI	1
25	$_{\rm a)}$ 3Cu + 8 HNO ₃ (dilute) \rightarrow 3Cu(NO ₃) ₂ + 2NO + 4H ₂ O	1
	$_{ii)}P_4 + 3NaOH + 3H_2O \rightarrow PH_3 + 3NaH_2PO_2$	1
	b) i) Due to absence of d-orbital, nitrogen cannot expand its valency beyond four.	1
	ii) Because of $p\pi - p\pi$ multiple bonding in dioxygen which is absent in sulphur.	1
	iii) Due to excitation of electron by absorption of radiation from visible region.	1
25	OR OR	1
25	$_{a)}$ $_{i)}$ $_{i}$ $_{i$	$\begin{vmatrix} 1 \\ 1 \end{vmatrix}$
	$_{\rm ii)}$ C + 2H ₂ SO ₄ (conc.) \rightarrow CO ₂ + 2 SO ₂ + 2 H ₂ O	1
	b) It is manufactured by Contact Process which involves following steps:	
	i) burning of sulphur or sulphide ores in air to generate SO ₂ .	
	ii) conversion of SO ₂ to SO ₃ by the reaction with oxygen in the presence of a catalyst (V ₂ O ₅)	
	iii) absorption of SO_3 in H_2SO_4 to give <i>Oleum</i> ($H_2S_2O_7$). The oleum obtained is diluted to give	1
	sulphuric acid	1
	$2SO_2(g) + O_2(g) \xrightarrow{V_2O_5} 2SO_3(g)$	
	Reaction condition – pressure of 2 bar and temperature of 720 K	
	Catalyst used is V_2O_5	1
26	Yield - 96 - 98% pure	1
26	a)i)Molar conductivity of a solution at a given concentration is the conductance of the volume V	1
	of solution containing one mole of electrolyte kept between two electrodes with area of cross	
	section A and distance of unit length. ii) Secondary bettery, can be rephared by possing current through it in apposite direction so that	
	ii) Secondary battery- can be recharged by passing current through it in opposite direction so that it can be used again.	1
	iii) Galvanic cells that are designed to convert the energy of combustion of fuels like hydrogen,	1
	methane, methanol, etc. directly into electrical energy are called fuel cells.	1
	b)i) The amount of chemical reaction which occurs at any electrode during electrolysis by a	
	current is proportional to the quantity of electricity passed through the electrolyte (solution or	1
	melt).	
	ii) Limiting molar conductivity of an electrolyte can be represented as the sum of the individual	1
	contributions of the anion and cation of the electrolyte.	1
	OR	
26	a) Degree of dissociation is the extent to which electrolyte gets dissociated into its constituent	1
	ions.	1
	$\alpha = \frac{\Lambda_m}{\Lambda_m}$	
	Λ_m°	
	b) E^{0} cell = $E^{0}_{Ag^{+}/Ag}$ - $E^{0}_{Ni2^{+}/Ni}$	
	=0.80V - 0.25V	

= 0.55V	1/2
$\log K_c = \left(\frac{nE^0 cell}{0.050}\right)$	1/2
$\frac{105 \text{Me}}{0.059}$	
$=\frac{2x0.55V}{}$	
0.059	1/
$\log K_c = 18.644$	1/2
$ \log K_c = 18.644 $ $ \Delta G^0 = - \text{ nFE}^0 \text{cell} $	1/2
$= -2x96500 \text{ Cmol}^{-1} \times 0.55 \text{V}$	
$=-106,150 \text{ Jmol}^{-1}$	1
$Max.work = +106150 \text{ Jmol}^{-1} \text{ or } 106.150 \text{ Jmol}^{-1}$	

Dr. Sangeeta Bhatia

Sh. S.K. Munjal

Sh. D.A. Mishra

Ms. Garima Bhutani