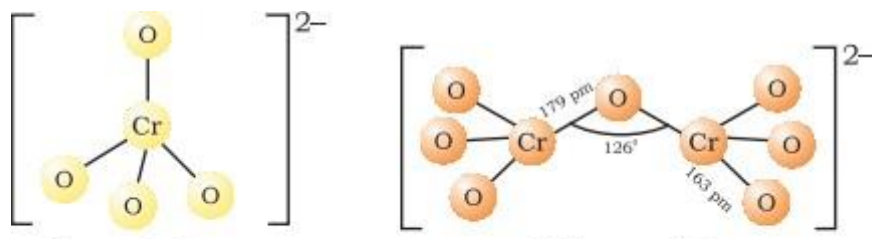
MARKING SCHEME

Q.No	Answer	Marks
1	D	1
2	C	1
3	D	1
4	D	1
5	A	1
6	D	1
7	B	1
8	C	1
9	D	1
10	B	1
11	C	1
12	B	1
13	A	1
14	B	1
15	A	1
16	B	1
17	When reaction is completed 99.9%, $[R]_n = [R]_0 - 0.999[R]_0$ $k = \frac{2.303}{t}\log\frac{[R]_0}{[R]}$ $= \frac{2.303}{t}\log\frac{[R]_0}{[R]_0 - 0.999[R]_0} = \frac{2.303}{t}\log 10^3$ $t = 6.909/k$ For half-life of the reaction $t_{1/2} = 0.693/k$ $\frac{t}{t_{1/2}} = \frac{6.909}{k} \times \frac{k}{0.693} = 10$ **OR** (i) $R_1 = k [A] [B]^2$ $R_2 = k [A] [3B]^2$ $R_2 = K[A] [B]^2$ x9 R_1 $K[A] [B]^2$ $R_2 = 9xR_1$ (9 times) (ii) $R_1 = K[A][B]^2$ $R_2 = K[A] [B]^2$ =½ x 4 $R_2 = 2 R_1$ (2times)	2 (1+1)
18	Correct cis + Correct Trans structure Ionisation isomer $[Co(NH_3)_5SO_4]Br$- pentaamminesulphatocobalt(III) bromide	(1/2+1/2) (1)
19	(i) One of the component should be so volatile that it acts as gas (ii) He, higher the K_H, lower the solubility	1 1
20	(i) PCC (ii) Conc.HNO3	1+1

21	(i) $C_6H_5Cl + 2Na + CH_3Cl \xrightarrow{THF} C_6H_5CH_3 + 2NaCl$ (ii) $C_6H_6 + CH_3COCl \xrightarrow{anhydrous\ AlCl_3} C_6H_5COCH_3 + HCl$	1 1
22	(i) $CH_3CH_2I + CH_3CH_2CH(CH_3)CH_2OH$ (ii) $(CH_3)_2C=CH_2 + CH_3OH + NaBr$ (iii) 2,4,6- Tri bromo phenol	1 1 1
23	(i) $A=CH_3CH_2CN, B=CH_3CH_3CH_2NH_2, C=CH_3CH_2CH_2NHCOCH_3$ (ii) $A=C_6H_5N_2BF_4$, $B=C_6H_5NO_2$, $C=C_6H_5NH_2$	½x 3 ½x 3
24	L et order of reaction wrt A is x & wrt B is y $R_1=K[A]^x.[B]^y$ $R_1= K(0.20)^x .(0.03)^y=5.07x10^{-5}$ $R_2=K(0.20)^x .(0.10)^y=5.07x10^{-5}$ $R_3=K(0.40)^x.(0.05)^y=14.3x10^{-5}$ $R_2=(0.30)y =1$ R_1 (0.10)y So Y=0 $R_3= (0.40)^x.(0.05)^y=14.3x10^{-5}$ $(0.20)^x.(0.10)^y$ $5.07x10^{-5}$ Since y=0 Taking log on both sides Xlog2= log2.8 X=log2.8/ log2 =1.5 Order wrt A =1.5 Order wrt B=0	1 1
25	(a) KCN is ionic but AgCN is covalent hence only N is available for bonding and isocyanides form. (b) Due to partial double bond characters in C-X bond , substitution of –X is difficult (c)It reacts with traces of water even and forms alkanes	1+1+1
26	$(P^0-P)/P^0 = X_B$ Calculation Answer.17.326mmHg Or ΔTb = Kb. W2x 1000/M2. W1 M2 = 2.53x1.8x1000/.88x90 = 58 g/mol	1 11/2 ½ 1 11/2 ½
27	(i) Nucleotide = Nitrogenous base + pentose sugar + phosphoric acidNucleoside = Nitrogenous base + pentose sugar (ii) Peptide = Amide linkage between amino acids in proteins Glycosidic linkage = linkage b/w two monosaccharides units through O atom (iii)Amylose =linear polymer of alpha D glucose Amylopectin =branched polymer of alpha D glucose	1 1 1
28	(i)The aryl halides do not undergo nucleophilic substitution with the anion formed by phthalimide	1

	(ii) Due to larger hydrophobic part of aromatic ring. (iii) Due to more extensive H bonding in primary amines.	1 1
29	(i) Globular protein – egg albumin Fibrous protein –myosin (ii) alpha helix and beta pleated sheet (iii) Amino acids which can be synthesised by human body and need not to be taken through diet are called non essential amino acids .eg glysine. Amino acids which cannot be synthesised by human body and so need to be taken through diet are called essential amino acids.eg lysine.	1 1 1+1
30	a)[$Co(NH_3)_5Cl]Cl_2$ b) primary valency= 3 , Secondary valency= 6 c)A = cis[$Co(NH_3)_4Cl_2$]Cl, trans[$Co(NH_3)_4Cl_2$]Cl (Draw Structure)	1 1 1+1
31(a)	The cell can be written as $Mg\|Mg^{2+}(0.130M)\|\|Ag^{+}(0.0001M)\|Ag$ $E_{(cell)} = E^{o}_{(cell)} - \frac{RT}{2F} \ln \frac{Mg^{2+}}{Ag^{+\,2}}$ $= 3.17\text{ V} - \frac{0.059V}{2} \log \frac{0.130}{(0.0001)^2} = 3.17\text{ V} - 0.21V = 2.96\text{ V.}$ b) $E^{o}_{(cell)} = \frac{0.059\text{ V}}{2} \log K_C = 0.46\text{ V}$ or $\log K_C = \frac{0.46\text{ V}\times 2}{0.059\text{ V}} = 15.6$ $K_C = 3.92 \times 10^{15}$ or a)Ag<Hg<Cr<Mg<K b)) 108 g Ag is deposited by = 965000C 1.45 g is deposited by =96500 x 1.45/108 =1295.6C Q = I x t 1295.6 = 1.5 x t t= 863s 2 x96500c deposits Zn = 65.3g 1295.6c deposits zn = 65.3 x 1295.6/2 x96500 = 0.436g 2 x96500c deposits Cu= 63.5g 1295.6c deposits Cu = 63.5 x 1295.6/2 x96500 =0.426 g	1+2 2 2 3
32	a)(i)Acetaldehyde gives Tollen/Fehling test,Acetone does not. (ii) Formaldehyde gives Fehling's test, Benzaldehyde does not (or any other test) (b)(i)$CH_3COCH_3 + H_2 \xrightarrow{Ni} CH_3CHOHCH_3$	1 1

	ii)CH_3CHO+ HCN → $CH_3CH(OH)CN \xrightarrow{Hydronium\ ion} CH_3CHOHCOOH$ (Complete) (iii)$C_6H_5C_2H_5 \xrightarrow{KMnO_{4/H^+}} C_6H_5COOH$ **OR** (a) (I) $CH_3CH_2CH_3$(Clemmensen Reduction) (ii) m-Bromo benzoic acid(Electrophilic Substitution) (iii)C_6H_5CHO(Rosenmund Reaction) (b) (i)FCH_2COOH , high electronegativity (ii)CH3COOH ,more stable carbcation .	1 1 1 1 1 1 1+1
33	a)i)As they have fully filled d subshell both in their ground state as well as in their common oxidation states. ii)As they show d-d transition. iii)Due to lanthanoid contraction b))(i)$3MnO_4^{2-} + 4H^+ \rightarrow 2MnO_4^- + MnO_2 + 2H_2O$ (ii) $2Fe^{2+} + S_2O_8^{2-} \rightarrow 2Fe^{3+} + 2SO_4^{2-}$ **OR** a) i) Misch metal ii)Scandium iii)Cerium b)  Chromate ion Dichromate ion hybridisation of Cr in both the ions is sp3.	1 1 1 1 1 1 1 1 1+1

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S.N	Name of Chapter	Objective Type Q (1)	Very short answer Q(2)	Short answer Q(3)	Case Based Q.(4)	Long Answer Q(5)	Total marks
1	Solution	2(1)	1(2)	1(3)			7
2	Electrochemistry	4(1)				1(5)	9
3	Chemical kinetics	2(1)	1(2)	1(3)			7
4	D &f block elements	2(1)				1(5)	7
5	Coordination Compd.	1(1)	1(2)		1(4)		7
6	Haloalkanes & Haloarenes	1(1)	1(2)	1(3)			6
7	Alcohols. Phenols, Ethers	1(1)	1(2)	1(3)			6
8	Aldehyde, ketone,carboxylic acid	3(1)				1(5)	8
9	Amines			2(3)			6
10	Biomolecules			1(3)	1(4)		7
	Total	16(1)	5(2)	7(3)	2(4)	3(5)	33(70)