Marking scheme – 2017

CHEMISTRY (043)/ CLASS XII

Set 56/1/1

Q.No	Value Points	Marks
1	MnO ₄ / KMnO ₄	1
2	N-Ethyl-N-methylethanamine	1
3	First order	1
4	BrCH ₂ CH=CHCH ₂ Cl	1
5	Both are surface phenomenon / both increase with increase in surface area (or any other correct similarity)	1
6	(i)NH ₃ +3 Cl ₂ (excess) → NCl ₃ + 3HCl	1
	(ii) $XeF_6 + 2H_2O \rightarrow XeO_2F_2 + 4HF$	1
	OR	
6	(i) $(NH_4)_2Cr_2O_7 \rightarrow N_2 + 4H_2O + Cr_2O_3$	1
	(ii) 4H ₃ PO ₃ →3H ₃ PO ₄ +PH ₃	1
7	(i) Properties that are independent of nature of solute and depend on	1
	number of moles of solute only.	
	(ii) Number of moles of solute dissolved per kg of the solvent .	1
8	(i)	1
	O O BOO BOO BOO	
	(ii)	
	F F	1
	P P	
9	$\Lambda^{\circ}_{CH3COOH} = \lambda^{\circ}_{CH3COO-} + \lambda^{\circ}_{H+}$	1/2
	$= 40.9 + 349.6 = 390.5 \text{ S cm}^2/\text{mol}$	1/2
	Now, $\alpha = \Lambda_m / \Lambda_m^0$	1/2
	= 39.05 / 390.5 = 0.1	1/2
10.	(i) $C=O \xrightarrow{NH_2NH_2} C=NNH_2 \xrightarrow{KOH/\text{ethylene glycol} \atop \text{heat}} CH_2 + N_2$ or $CH_2 + N_2$ (ii) NH2NH2 $CH_3 + N_2$ (iii) KOH/ethylene glycol, heat	1

	$CH_3 + CrO_2Cl_2 \xrightarrow{CS_2} CH(OCrOHCl_2)_2 \xrightarrow{H_3O^*} CHO$ Toluene Chromium complex Benzaldehyde	
	or	
		1
	CH ₃ . (i) CrO2Cl2, CS2	
	Toluene (ii) H3O+ Benzaldehyde	
	(- y	
11	$\Delta T_f = K_f m$	1/2
11	Here, $m = w_2 x 1000 / M_2 X M_1$	/2
		1
	$273.15-269.15 = K_f \times 10 \times 1000 / 342 \times 90$	1
	$K_f = 12.3 \text{ K kg/mol}$	1/2
	$\Delta T_f = K_f m$	
	= 12.3 x 10 x1000/ 180x90	
	= 7.6 K	
	$T_f = 273.15 - 7.6 = 265.55 \text{ K}$ (or any other correct method)	1
12	(i)m = ZIt	1/2
	= <u>108x2x15 x60</u>	1
	1×96500	
	= 2.01 g (or any other correct method)	1/2
	(ii) Cells that converts the energy of combustion of fuels directly into electrical	1
	energy.	
13	(i) Coordination isomerism	1
	(ii) Unpaired electrons in $[Ni(H_2O)_6]^{2+}$ / d-d transition	1
	(iii) Pentaamminecarbonatocobalt(III) Chloride	1
14	(i) Lyophobic are liquid(dispersion medium)-hating and lyophillic are	1
1-7	liquid(dispersion medium)-loving colloids.	-
	(ii) Solution is a Homogenous mixture while colloid is heterogenous mixture	1
	/ does not show Tyndall effect -shows Tyndall effect.	1
	, ,	1
	(iii) Homogenous catalysis : reactants and catalyst are in same phase -	1
	Heterogeneous catalysis: reactants and catalyst are not in same phase.	
	(or any other correct difference)	
15	(a) $k = \frac{2.303}{t} \log \frac{[A]o}{[A]}$	1/2
	l i	
	$= \frac{2.303}{300} \log \frac{1.6 \times 10^{-2}}{0.8 \times 10^{-2}}$	
	$= \frac{2.303}{300} \log 2 = 2.31 \times 10^{-3} \text{ s}^{-1}$	1/2
	300	
	2.303 . [A]o	
	At 600 s, $k = \frac{2.303}{t} \log \frac{[A]o}{[A]}$	1/2
	$= \frac{2.303}{600} \log \frac{1.6 \times 10^{-2}}{0.4 \times 10^{-2}}$	
	$-\frac{108}{600}$ $\frac{108}{0.4 \times 10^{-2}}$	
	$= 2.31 \times 10^{-3} \text{ s}^{-1}$	
	In the name of the state of the	
	k is constant when using first order equation therefore it follows first order	1/2
	kinetics.	
	or	

	In equal time interval, half of the reactant gets converted into product and	
	the rate of reaction is independent of concentration of reactant, so it is a	
	first order reaction.	
	(b) $t_{1/2} = 0.693/k$	
	$= 0.693/ 2.31 \times 10^{-3}$	
	= 300 s	
	(If student writes directly that half life is 300 s, award full marks)	1
16	(i) 1- Bromopentane	1
	(ii) 2-Bromopentane	1
	(iii) 2-Bromo-2-methylbutane	1
17	(i) The impurities are more soluble in the melt than in the solid state of the metal.	1
	(ii)PbS	1
	(iii)Impurities like SiO ₂ etc are removed by using NaOH solution and pure alumina is	1
	obtained .	
18.	(i) A : C_6H_5MgBr B : C_6H_5COOH C : C_6H_5COCI	½ × 3
		½ × 3
	(ii)A: CH ₃ CHO B: CH ₃ CH(OH)CH ₂ CHO C: CH ₃ CH=CHCHO	
	OD	
10	OR OH OOO!	
18	(i) C_6H_5COOH soci ₂ C_6H_5COCI H_2 , Pd - BaSO ₄ C_6H_5CHO	1
	(ii) $C_6H_5C_2H_5 \xrightarrow{K_2Cr_2O_7/H^+} C_6H_5COOH$	
	(II) O6I 15O2I 15 K2O2O7/H O6I 15OOOI I	1
	(iii)CH ₃ COCH _{3 NaBH₄} CH ₃ CH(OH)CH _{3 conc.H₂SO₄ CH₃CH=CH₂}	
	(III) OT 13 COUNTY OF 13 COUNTY	1
	(or any other correct method)	
19.		1/2+1/2
	(i) HOCH₂CH₂OH + HOOC ← O ← COOH	
	<i>4</i> 00	
	(ii)	1/2+1/2
	H_2N N NH_2	
	H ₂ N NH ₂ NH ₂ N N N N	
	NH ₂	
	+ HCHO	
	(iii)CH ₂ =CH-CH=CH ₂ + CH ₂ =CHCN	1/2 + 1/2
20.	(i) Anionic detergents are sodium salts of sulphonated long chain alcohols or	1
_3.	hydrocarbons / alkylbenzene sulphonate or detergents whose anionic part is	-
	involved in cleansing action.	1
	(ii)Broad spectrum antibiotics: Antibiotics which kill or inhibit a wide range of	1
	Gram-positive and Gram-negative bacteria.	
	Gram-positive and Gram-negative bacteria. (iii) Antiseptics are the chemicals which either kill or prevent growth of microbes	1
26	Gram-positive and Gram-negative bacteria. (iii) Antiseptics are the chemicals which either kill or prevent growth of microbes on living tissues.	1
21	Gram-positive and Gram-negative bacteria. (iii) Antiseptics are the chemicals which either kill or prevent growth of microbes on living tissues. (i) Due to the decrease in bond dissociation enthalpy / due to increase in	1
21	Gram-positive and Gram-negative bacteria. (iii) Antiseptics are the chemicals which either kill or prevent growth of microbes on living tissues. (i) Due to the decrease in bond dissociation enthalpy / due to increase in atomic size from O to Te.	1 1 1
21	Gram-positive and Gram-negative bacteria. (iii) Antiseptics are the chemicals which either kill or prevent growth of microbes on living tissues. (i) Due to the decrease in bond dissociation enthalpy / due to increase in atomic size from O to Te. (ii) Due to small size of fluoride ion / high charge density of fluoride ion /	1
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23	(i)concerned, caring, socially alert, leadership (or any other 2 values) (ii)starch				
	(iii)α -Helix and β-pleated sheets				
	(iv)Vitamin B / B ₁ / B ₂ / B ₆ / C (any two)				
24	a) (i) Due to small size and high ionic charge / availability of d orbitals.				
- '	(ii) Higher is the oxidation state higher		1		
	oxidation state of a metal increases, ion		_		
	(iii) Because Mn ²⁺ has d ⁵ as a stable co		1		
	stable due to stable t^3_{2g}	omiguration whereas er is more	_		
	ē	ation atota/hath aharr agatusation/			
	b) Similarity-both are stable in +3 oxid		1		
	irregular electronic configuration (or an	•	1		
	Difference- actinoids are radioactive an		1		
	wide range of oxidation states but lanth	anoids don't (or any other correct	1		
	difference)				
		PR			
24	a) i) In p block elements the difference metals the difference is 1	in oxidation state is 2 and in transition	1		
	ii) Cu ⁺ , due to disproportionation react	ion / low hydration enthalpy	1/2 + 1/2		
	iii) Due to formation of chromate ion /		1		
	b) Actinoids are radioactive, actinoids	_	1+1		
25	(a) $\rho = (zxM)/a^3x N_a$		1/2		
	$11.5 = z \times 93 / [(300 \times 10^{-10})^3 \times 6.02 \times 10^{23}]$				
	Z = 2.0		1 1/2		
	Body centred cubic(bcc)		1		
	<u>(b)</u>		_		
	Amorphous solids	Crystalline solids			
	Short range order	Long range order	1+1		
	Isotropic	Anisotropic	1.1		
		(or any other correct difference)			
		PR			
25	a) n= given mass / molar mass				
	= 8.1 / 27 mol		1/2		
	Number of atoms= $\frac{8.1}{27}$ x 6.022x10 ²³		1/2		
	Number of atoms in one unit cell= 4 (fcc	,			
	Number of unit cells = $\left[\frac{8.1}{27} \times 6.022 \times 10^{23}\right]$ /	4	1/2		
	$= 4.5 \times 10^{22}$		1/2		
	Or				
	27g of Al contains= 6.022x10 ²³ atoms		1/2		
	8.1g of Al contains = $(6.022x10^{23} / 27) x$	8.1	1/2		
	No of unit cells = total no of atoms /4				
	$= \left[\frac{8.1}{27} \times 6.022 \times 10^{23}\right] / 4$				
	$=4.5 \times 10^{22}$				
	b) i) Due to comparable size of cation an		1		
	ii) P has 5 valence e, an extra electron semiconductor.	results in the formation of n-type	1		
	iii)In ferrimagnetism ,domains / magnetic direction in unequal numbers while in an opposite direction in equal numbers so th completely ,net magnetism is zero / diag	ntiferromagnetic the domains align in ney cancel magnetic moments	1		

26	СООН	
	OCOCH ₃	1
	a) i)	
	ii) (CH ₃) ₂ CHOH and CH ₃ CH ₂ I	1
	iii) CH ₃ CH=CHCHO	1
	b) i) Add neutral FeCl ₃ to both the compounds, phenol gives violet complex.	1
	ii) Add anhy ZnCl ₂ and conc. HCl to both the compounds,	1
	2-methyl propan-2-ol gives turbidity immediately. (or any other correct test)	
	OR	
26	a) i)Aq. Br ₂	1
	$\text{ii})B_2H_6$, H_2O_2 and OH^-	1
	b) i) ethanol <phenol<p-nitrophenol< td=""><td>1</td></phenol<p-nitrophenol<>	1
	ii) propane <propanal<propanol< td=""><td>1</td></propanal<propanol<>	1
	c)	
	CH ₃ CH ₂ -O: + CH ₃ -CH ₂ OH	
	H	1

1	Dr. (Mrs.) Sangeeta Bhatia	12	Sh. S. Vallabhan	
2	Dr. K.N. Uppadhya	13	Dr. Bhagyabati Nayak	
3	Prof. R.D. Shukla	14	Ms. Anila Mechur Jayachandran	
4	Sh. S.K. Munjal	15	Mrs. Deepika Arora	
5	Sh. D.A. Mishra	16	Ms. Seema Bhatnagar	
6	Sh. Rakesh Dhawan	17	Mrs. Sushma Sachdeva	
7	Dr. (Mrs.) Sunita Ramrakhiani	18	Dr. Azhar Aslam Khan	
8	Mrs. Preeti Kiran	19	Chauhan	
9	Ms. Neeru Sofat	20	Kaushik	
10	Sh. Pawan Singh Meena	21	Ms. Abha Chaudhary	
11	Mrs. P. Nirupama Shankar	22	Ms. Garima Bhutani	

Marking scheme – 2017

CHEMISTRY (043)/ CLASS XII

Set 56/1/2

QNo.	Value Points	Marks
1	Both are surface phenomenon / both increase with increase in surface area	1
	(or any other correct similarity)	
2	ÇI	1
	NO_2	
	NO ₂	
3	First order	1
4	N-Methylpropan-2-amine	1
5	$Cr_2O_7^{2-}$ / CrO_4^{2-} / $K_2Cr_2O_7$ / K_2CrO_4	1
6	$\Lambda^{\circ}_{CH3COOH} = \lambda^{\circ}_{CH3COO-} + \lambda^{\circ}_{H+}$	1/2
0	Λ CH3COOH – Λ CH3COOL + Λ H+ = $40.9 + 349.6 = 390.5 \text{ S cm}^2/\text{mol}$	1/2
	Now, $\alpha = \Lambda_m / \Lambda_m^0$	1/2
_	= 39.05 / 390.5 = 0.1	1/2
7	(i)	1
	P	
	H	
	/;; <u>)</u>	
	(ii)	
	FF	1
	Xe /	
	F	
0	(i) The solution that chays Booults Law over the entire range of	1
8	(i) The solution that obeys Raoults Law over the entire range of	1
	concentration	
	(ii) Number of moles of solute dissolved per litre of solution or	1
	$M = \frac{w_b \times 1000}{M_b \times 1000}$	
	M _b X V (mL)	
9	(i) $Cl_2 + H_2O \rightarrow 2 HCl + [O] / HCl + HOCl$	1
	(ii) $XeF_6 + 3H_2O \rightarrow XeO_3 + 6HF$	1
	OR	
9	(i) Cu + 2 $H_2SO_4 \rightarrow CuSO_4 + SO_2 + 2H_2O$	1
	$(ii)SO_3 + H_2O \rightarrow H_2SO_4$	1
10.		1
	(i) Y /Red phosphorus	
	$R-CH_2-COOH \xrightarrow{\text{(i) } X_2/\text{Red phosphorus}} R-CH-COOH$	
	(ii) H ₂ O	
	X = Cl, Br	
	,	
	I	

	NaOH & CaO	
	(ii) R -COONa $\xrightarrow{\text{NaOH & CaO}}$ R -H + Na ₂ CO ₃	1
11	(i) Lyophobic are liquid (dispersion medium) - hating and lyophillic are liquid (dispersion medium) - loving colloids.	1
	(ii) Solution is a Homogenous mixture while colloid is heterogenous mixture / does not show Tyndall effect -shows Tyndall effect.	1
	(iii) Homogenous catalysis : reactants and catalyst are in same phase -Heterogeneous catalysis: reactants and catalyst are not in	1
	same phase. (or any other correct difference)	
12	(i) 1- Bromopentane	1
	(ii) 2-Bromopentane	1
	(iii) 2-Bromo-2-methylbutane	1
13.	(i) Metal is converted into its volatile compound and collected elsewhere. It is then decomposed at high temperature to give pure metal.	1
	(ii) The impurities are more soluble in the melt than in the solid state of the metal.	1
	(iii) Different components of a mixture are differently adsorbed on an adsorbent.	1
14	$\Delta T_f = K_f m$	1/2
	Here, $m = w_2 x 1000 / M_2 X M_1$	1
	273.15-269.15 = K _f x 10 x1000/ 342 x90 K _f = 12.3 K kg/mol	1 1/2
	$\Delta T_f = K_f m$	/2
	= 12.3 x 10 x1000/ 180x90	
	= 7.6 K	
	$T_f = 273.15 - 7.6 = 265.55 \text{ K}$ (or any other correct method)	1
15.	(i) Cationic detergents are quarternary ammonium salts of amines with acetates, chlorides or bromides as anions, cationic part has long chain	1
	hydrocarbon / detergents whose cationic part is involved in cleansing action.	1
	(ii)Narrow spectrum antibiotics are effective mainly against Gram-positive	
	or Gram-negative bacteria (iii) Disinfectants kill or prevent growth of microbes and are applied on inanimate / non living objects	1
16	(i)m = ZIt	1/2
10	= 108x2x15 x60	1
	1×96500	
	= 2.01 g (or any other correct	1/2
	method)	
	(ii) Cells that converts the energy of combustion of fuels directly into	1
17	electrical energy. (i) Coordination isomerism	1
	(ii) Unpaired electrons in $[Ni(H_2O)_6]^{2+}$ / d-d transition	1
	(iii) Pentaamminecarbonatocobalt(III) Chloride	1
18	(i) A : C_6H_5MgBr B : C_6H_5COOH C : C_6H_5COCI	½ × 3
	(ii)A: CH ₃ CHO B: CH ₃ CH(OH)CH ₂ CHO C: CH ₃ CH=CHCHO	½×3
	OR	
18	(i) C_6H_5COOH soci2 C_6H_5COCI H_2 , $Pd-BaSO_4$ C_6H_5CHO	1
	(ii) $C_6H_5C_2H_5 \xrightarrow{\kappa_2C_{r_2}O_7/H^*} C_6H_5COOH$	1
	(iii)CH ₃ COCH _{3 NaBH₄} CH ₃ CH(OH)CH _{3 conc.H₂SO₄ CH₃CH=CH₂}	
	(or any other correct method)	1

	L way a standard and	
19.	(i)CH ₂ =C(Cl)CH=CH ₂	1
	(ii)	1
	H_2N N N N N	
	+ HCHO	
	(iii) CH ₂ =CHCH=CH ₂ + CH ₂ =CHC ₆ H ₅	1
20	(a) $k = \frac{2.303}{t} \log \frac{[A]o}{[A]}$	1/2
	$= \frac{2.303}{300} \log \frac{1.6 \times 10^{-2}}{0.8 \times 10^{-2}}$	
	$= \frac{2.303}{300} \log 2 = 2.31 \times 10^{-3} \text{ s}^{-1}$	1/2
	At 600 s, $k = \frac{2.303}{t} \log \frac{[A]o}{[A]}$	1/2
	$= \frac{2.303}{600} \log \frac{1.6 \times 10^{-2}}{0.4 \times 10^{-2}}$	
	$= 2.31 \times 10^{-3} \text{ s}^{-1}$	
	k is constant when using first order equation therefore it follows first order kinetics.	1/2
	or In equal time interval, half of the reactant gets converted into product and the rate of reaction is independent of concentration of reactant, so it is a first order reaction.	
	(b) $t_{1/2} = 0.693/k$ = 0.693/2.31x10 ⁻³	
	= 300 s (If student writes directly that half life is 300 s , award full marks)	1
21	(i) Due to the resonance, the electron pair of nitrogen atom gets delocalised towards carbonyl group / resonating structures.	1
	(ii) Because of +I effect in methylamine electron density at nitrogen increases whereas in aniline resonance takes place and electron density	
	on nitrogen decreases / resonating structures.	1 1
22	(iii) Due to protonation of aniline / formation of anilinium ion (i) Due to the decrease in bond dissociation enthalpy / due to	1
	increase in atomic size from O to Te. (ii) Due to small size of fluoride ion / high charge density of	1
	fluoride ion / high charge size ratio of fluoride ion. (iii) Absence of d-orbitals.	1
23	(i) Concerned, caring, socially alert, leadership (or any other 2 values) (ii) Starch	½ + ½ 1
	(iii) α -Helix and β-pleated sheets	1 1/2 + 1/2
24	(iv) Vitamin B / B ₁ / B ₂ / C (any two)	1/2 + 1/2
	a) i) OCOCH ₃	1
	ii) (CH ₃) ₂ CHOH and CH ₃ CH ₂ I	1
	iii) CH ₃ CH=CHCHO b) i) Add neutral FeCl ₃ to both the compounds, phenol gives violet	1 1
	complex.	
	ii) Add anhy ZnCl ₂ and conc.HCl to both the compounds,	1

	2-methyl propan-2-ol gives turbidity immediately. (or any other correct				
	test)				
	OR				
24	a) i) Aq. Br ₂		1		
	ii) B ₂ H ₆ , H ₂ O _{2 and} OH				
	b) i) ethanol < phenol < p-nitrophenol				
	ii) propane < propanal < propanol				
	(c)				
	H CH CH CH CH				
	CH ₃ CH ₂ -O: + CH ₃ -CH ₂ -OH		1		
	Ĥ				
25	a) (i) Due to small size and high ionic cha	•	1		
	(ii) Higher is the oxidation state higher is		1		
	oxidation state of a metal increases, ionic				
	(iii) Because Mn ²⁺ has d ⁵ as a stable cor	nfiguration whereas Cr^{3+} is	1		
	more stable due to stable t_{2g}^3				
	b) Similarity-both are stable in +3 oxidat	tion state/ both show			
	contraction/ irregular electronic configur	ration (or any other suitable	1		
	similarity)				
	Difference- actinoids are radioactive and	lanthanoids are not / actinoids	1		
	show wide range of oxidation states but I	lanthanoids don't (or any other			
	correct difference)				
	OR				
25	a) i) In p block elements the difference i	n oxidation state is 2 and in	1		
	transition metals the difference is 1				
	ii) Cu ⁺ , due to disproportionation reaction / low hydration enthalpy				
	iii) Due to formation of chromate ion / CrO_4^{2-} ion, which is yellow in				
	colour	•			
	b) Actinoids are radioactive, actinoids sl	how wide range of oxidation	1 + 1		
	states	<u> </u>			
26	(a) $\rho = (zxM)/a^3x N_a$		1/2		
	$11.5 = z \times 93 / [(300x10^{-10})^3 \times 6.02x10^{23}]$		1		
	Z=2.0		1/2		
	Body centred cubic(bcc)		1		
	(b)	otallina aalida			
		stalline solids g range order			
	Š.	sotropic	1+1		
		or any other correct difference)			
	OR	,			
26	a) n= given mass / molar mass				
	= 8.1 / 27 mol		1/2		
	Number of atoms= $\frac{8.1}{27}$ x 6.022x10 ²³		1/2		
	Number of atoms in one unit cell= 4 (fcc)				
	Number of unit cells = $\left[\frac{8.1}{27} \times 6.022 \times 10^{23}\right] / 4$	1	1/2		
	$= 4.5 \times 10^{22}$		1/2		
	Or - 4.6 X16				
	27g of Al contains= 6.022x10 ²³ atoms		1/2		
	8.1g of Al contains = $(6.022 \times 10^{23} / 27) \times 8$.1	1/2		
	No of unit cells = total no of atoms /4				
	$= \left[\frac{8.1}{27} \times 6.022 \times 10^{23}\right] / 4$		1/2		
	$=4.5 \times 10^{22}$		1/2		
	b) i) Due to comparable size of cation and		1		
	ii) P has 5 valence e, an extra electron re	esults in the formation of n-type	1		
	semiconductor.				

iii) In ferrimagnetism ,domains / magnetic moments are aligned in	1
opposite direction in unequal numbers while in antiferromagnetic the	
domains align in opposite direction in equal numbers so they cancel	
magnetic moments completely ,net magnetism is zero / diagrammatic	
representation.	

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Marking scheme – 2017

CHEMISTRY (043)/ CLASS XII

Set 56/1/3

Q.No	Value Points	Marks
1	i) No effect	1/2
	ii) Decreases	1/2
2	Both are surface phenomenon / both increase with increase in surface area	1
	(or any other correct similarity)	
3	MnO ₄ - / KMnO ₄	1
4	BrCH ₂ (CH ₃)C=CH ₂	1
5	N,N-Dimethylethanamine	1
6	(i)	1
	$C = O \xrightarrow{Zn-Hg} CH_2 + H_2O$	
	(ii) H C=0 + Conc. KOH $\stackrel{\Delta}{\longrightarrow}$ H C=0 + Conc. KOH $\stackrel{\Delta}{\longrightarrow}$ H O OK	1
7.	(i)	1
	HO OH OH OH	
	(ii) F Xe F	1
8	 (i) If the molar mass calculated by using any of the colligative properties to be different than theoretically expected molar mass (ii) Extent of dissociation or association or ratio of the observed colligative property to calculated colligative property 	1
9	$\Lambda^{\circ}_{CH3COOH} = \lambda^{\circ}_{CH3COO} + \lambda^{\circ}_{H+}$	1/2
	= 40.9 + 349.6 = 390.5 S cm ² /mol	1/2
	Now, $\alpha = \Lambda_m / \Lambda_m^{\circ}$	1/2
	= 39.05 / 390.5 = 0.1	1/2
10	(i) $F_2 + 2Cl^- \rightarrow 2F^- + Cl_2$	1
10	1	l .
10	(ii) 2XeF ₂ + 2H ₂ O \rightarrow 2Xe +4HF +O ₂	1
	(ii) $2XeF_2 + 2H_2O \rightarrow 2Xe + 4HF + O_2$ OR	1
10		1

11	(i) Due to the resonance, the electron pair of nitrogen atom gets delocalised towards carbonyl group / resonating structures. (ii) Because of +I effect in methylamine electron density at nitrogen increases whereas in aniline resonance takes place and electron density on nitrogen decreases / resonating structures. (iii) Due to protonation of aniline / formation of anilinium ion	1 1 1
12	(i) Due to the decrease in bond dissociation enthalpy / due to	1
12	increase in atomic size from O to Te.	1
	(ii) Due to small size of fluoride ion / high charge density of fluoride	1
	ion / high charge size ratio of fluoride ion.	-
	(iii) Absence of d-orbitals.	
13	(i) Anionic detergents are sodium salts of sulphonated long chain alcohols or hydrocarbons / detergents whose anionic part is involved in cleansing action.	1
	(ii) Limited spectrum antibiotics are effective against a single organism or disease.	1
	(iii) Tranquilizers are class of chemicals used for treatment of stress or mild or severe mental diseases.	1
14	(i)	1
	H H	
	H ₂ C N C=0	
	H ₂ C CH ₂ ·	
	H ₂ C — CH ₂ / NH ₂ (CH ₂) ₅ -COOH	
	(ii)	
	H ₂ N N NH ₂ N NH ₂ + HCHO	1
	1110110	
	(iii)CF ₂ =CF ₂	1
15	(i) A: C ₆ H ₅ MgBr B: C ₆ H ₅ COOH C: C ₆ H ₅ COCI	½ × 3
		½ × 3
	(ii)A:CH ₃ CHO B:CH ₃ CH(OH)CH ₂ CHO C:CH ₃ CH=CHCHO	
	OR	
15	(i) C_6H_5COOH socl ₂ C_6H_5COCI H_2 , Pd - BaSO ₄ C_6H_5CHO	1
	(ii) $C_6H_5C_2H_5 \xrightarrow{\kappa_2Cr_2O_7/H^+} C_6H_5COOH$	1
	(iii)CH ₃ COCH _{3 NaBH₄} CH ₃ CH(OH)CH _{3 conc.H₂SO₄ CH₃CH=CH₂}	1
16	(or any other correct method) (i) The impurities are more soluble in the melt than in the solid state of the	1
10	metal.	1
	(ii) PbS	_
	(iii) Impurities like SiO ₂ etc are removed by using NaOH solution and pure	1
	alumina is obtained .	
17	(i) 1- Bromopentane	1
	(ii) 2-Bromopentane	1
10	(iii) 2-Bromo-2-methylbutane	1
18	(a) $k = \frac{2.303}{t} \log \frac{[A]o}{[A]}$	1/2
l	I	1

	$=\frac{2.303}{300} \log \frac{1.6 \times 10^{-2}}{0.8 \times 10^{-2}}$	
	$-\frac{108}{300}$ $\frac{108}{0.8 \times 10^{-2}}$	
	2.303	1/2
	$= \frac{2.303}{300} \log 2 = 2.31 \times 10^{-3} \text{ s}^{-1}$	
	2 303 [Δ]ο	
	At 600 s, $k = \frac{2.303}{t} \log \frac{[A]o}{[A]}$	1/2
	$= \frac{2.303}{600} \log \frac{1.6 \times 10^{-2}}{0.4 \times 10^{-2}}$	
	$600 0.4 \times 10^{-2}$	
	$= 2.31 \times 10^{-3} \text{ s}^{-1}$	
	k is constant when using first order equation therefore it follows first	1/2
	order kinetics.	
	or	
	In equal time interval, half of the reactant gets converted into product	
	and the rate of reaction is independent of concentration of reactant,	
	so it is a first order reaction.	
	(1.)	
	(b) $t_{1/2} = 0.693/k$ = 0.693/ 2.31x10 ⁻³	
	= 0.693/ 2.31x10 ° = 300 s	
	(If student writes directly that half life is 300 s , award full marks)	1
19.	(i) Multimolecular colloid: a large number of atoms or smaller molecules of	1
	a substance aggregate together to form species having size in the colloidal	_
	range.	
	Macromolecular: Large sized molecules whose particle size lies in the	
	colloidal range. (ii) Sol are solid dispersed in liquid while gel are liquid dispersed in solid	
	(iii) In O/W emulsion, water acts as dispersion medium while in W/O oil	1
	acts as dispersion medium	1
20	(i)Optical isomerism	1
	(ii)d ² sp ³ , diamagnetic	1/2 + 1/2
	(iii)Triamminetrichloridochromium(III)	1
21	(i)m = ZIt = 108×2×15 ×60	1/2
	= <u>108x2x15 x60</u> 1×96500	1
	= 2.01 g (or any other correct	1/2
	method)	/2
	(ii) Cells that converts the energy of combustion of fuels directly into	1
	electrical energy.	
22	$\Delta T_f = K_f m$	1/2
	Here , m = $w_2 x 1000 / M_2 X M_1$	
	$273.15-269.15 = K_f \times 10 \times 1000 / 342 \times 90$	1
	K _f = 12.3 K kg/mol	1/2
	$\Delta T_f = K_f m$	
	= 12.3 x 10 x1000/ 180x90 = 7.6 K	
	$T_f = 273.15 - 7.6 = 265.55 \text{ K}$ (or any other correct method)	1
23	(i)concerned, caring, socially alert, leadership (or any other 2 values)	1/2 + 1/2
	(ii)starch	1
	(iií)α -Helix and β-pleated sheets	1/2 + 1/2
	(iv)Vitamin B / B ₁ / B ₂ / B ₆ / C (any two)	1/2 + 1/2
23	(ii)starch	1 1/2 + 1/2

2.4	(a) $\rho = (zxM) / a^3 x N_a$		1/
24	(a) $\rho = (2xivi)/a x iv_a$		½ 1
	$11.5 = z \times 93 / [(300 \times 10^{-10})^3 \times 6.02 \times 10^{23}]$		
	Z = 2.0		½ 1
	Body centred cubic(bcc)		
	Body controd cubic(boo)		
	(b)		
		talline solids	1+1
		range order	
	3	otropic	
	(or any other correct difference)		
	OR	,	
24	a) n= given mass / molar mass		
	= 8.1 / 27 mol		1/2
	Number of atoms= $\frac{8.1}{27}$ x 6.022x10 ²³		1/2
	Number of atoms in one unit cell= 4 (fcc)		, <u>-</u>
			1/2
	Number of unit cells = $\left[\frac{8.1}{27} \times 6.022 \times 10^{23}\right] / 4$		1/2
	$= 4.5 \times 10^{22}$		/2
	Or		1/2
	27g of Al contains= 6.022x10 ²³ atoms 8.1g of Al contains =(6.022x10 ²³ / 27) x 8.1		/2 1/ ₂
	No of unit cells = total no of atoms /4		/2
			1/
	$=\left[\frac{8.1}{27} \times 6.022 \times 10^{23}\right] / 4$		1/2
	$=4.5 \times 10^{22}$		1/2
	b) i) Door to compare blooding of cotion and a	wise /lanes size of andison iss	
	b) i) Due to comparable size of cation and anion / large size of sodium ion ii) P has 5 valence of an extra electron results in the formation of a type		
	ii) P has 5 valence e ⁻ , an extra electron results in the formation of n-type semiconductor.		
	iii) In ferrimagnetism ,domains / magnetic moments are aligned in opposite		
	direction in unequal numbers while in antife		
	in opposite direction in equal numbers so th		1
	completely ,net magnetism is zero / diagram		
25	СООН	•	
	i		1
	$OCOCH_3$		
	·		
	a) i)		
	ii) (CH ₃) ₂ CHOH and CH ₃ CH ₂ I		1
			1
	iii) CH ₃ CH=CHCHO b) i) Add neutral FeCl ₃ to both the compounds, phenol gives violet		
	complex.	inds, prienoi gives violet	1
		the compounds	1
	ii) Add anhy ZnCl ₂ and conc. HCl to both the compounds, 2-methyl propan-2-ol gives turbidity immediately. (or any other correct test)		1
	OR	iately. (or any other correct test)	
25	a) i) Aq. Br ₂		1
23			1
	ii) B_2H_6 , H_2O_2 and OH^2		
	b) i) ethanol < phenol < p-nitrophenol		1
	ii) propane < propanal < propanol		1
	c)		
	$CH.CH\ddot{O}$: + $CHCH\ddot{O}$		
	$CH_3CH_2 - \overset{\circ}{O}: + CH_3 - CH_2 - \overset{\circ}{O} \overset{+}{H}$		1
	п		

26	a) (i) Due to small size and high ionic charge / availability of d orbitals.	1		
	(ii) Higher is the oxidation state higher is the acidic character / as the			
	oxidation state of a metal increases, ionic character decreases			
	(iii) Because Mn ²⁺ has d ⁵ as a stable configuration whereas Cr ³⁺ is more			
	stable due to stable t^3_{2g}			
	b) Similarity-both are stable in +3 oxidation state/ both show			
	contraction/ irregular electronic configuration (or any other suitable	1		
	similarity)	1		
	Difference- actinoids are radioactive and lanthanoids are not / actinoids			
	show wide range of oxidation states but lanthanoids don't (or any other			
	correct difference)			
	OR			
26	a) i) In p block elements the difference in oxidation state is 2 and in	1		
	transition metals the difference is 1			
	ii) Cu ⁺ , due to disproportionation reaction / low hydration enthalpy	1/2 + 1/2		
	iii) Due to formation of chromate ion / $\text{CrO}_4^{2^2}$ ion, which is yellow in	1		
	colour			
	b) Actinoids are radioactive, actinoids show wide range of oxidation			
	states.	1 + 1		

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