INDIAN SCHOOL AL WADI AL KABIR

SAMPLE PAPER 2

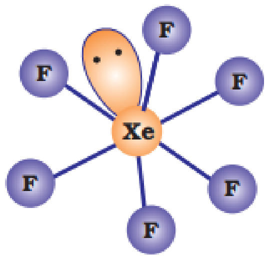
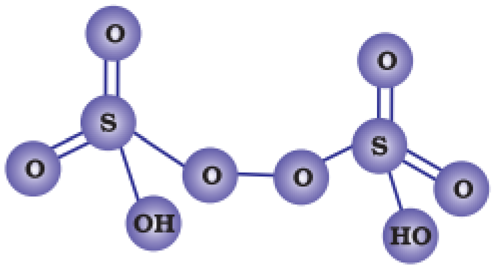
CLASS XII **MAX. MARKS: 70**

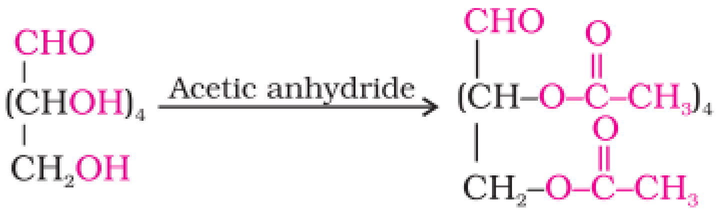
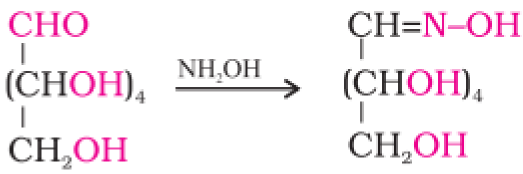
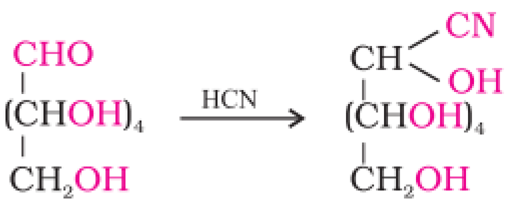
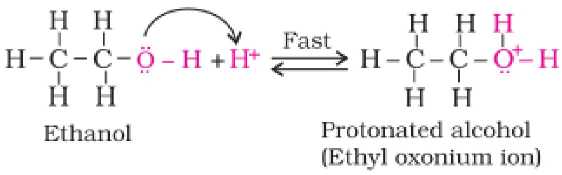
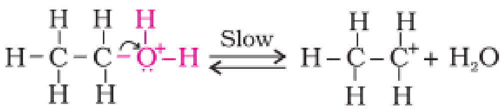
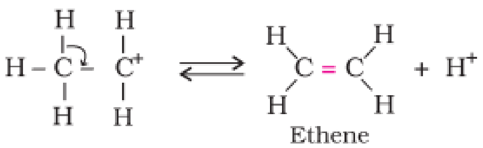
SUBJECT: CHEMISTRY **(043)** **TIME: 3 Hrs.**

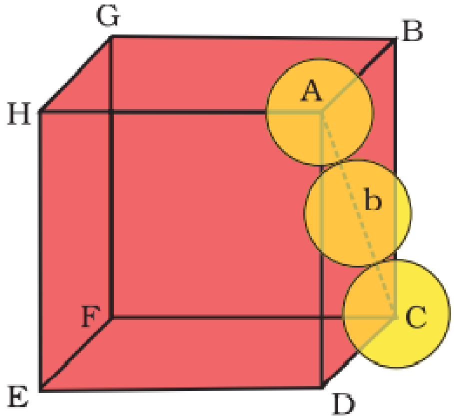
SET - II

ANSWER KEY

1.	i) c ii) a iii) b iv) d	
2.	i) d ii) b iii) a iv) c	
3.	d	
4.	a	
5.	b	
6.	d	
7.	c	
8.	b	
9.	c	
10.	d	
11.	c	
12.	a	
13.	d	
14.	a	
15.	b	
16.	c	
17.	Frenkel Defect - The smaller ion (usually cation) is dislocated from its normal site to an interstitial site. Frenkel defect is shown by ionic substance in which there is a large difference in the size of ions. Eg:- ZnS, AgCl, AgBr and AgI Schottky Defect - It is basically a vacancy defect in ionic solids. Schottky defect is shown by ionic substance in which there not much difference in the size of ions. Eg:- NaCl, KCl, CsCl and AgBr. **OR** a) Stoichiometric defect b) Density of the crystal decreases.	½ ½ ½ ½ **1**

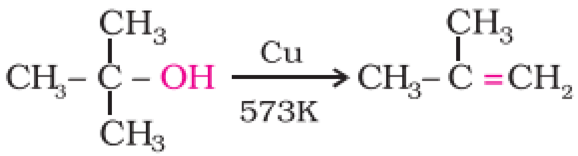
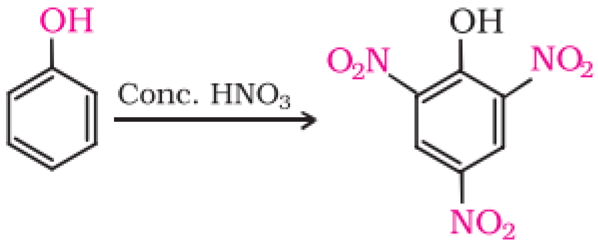
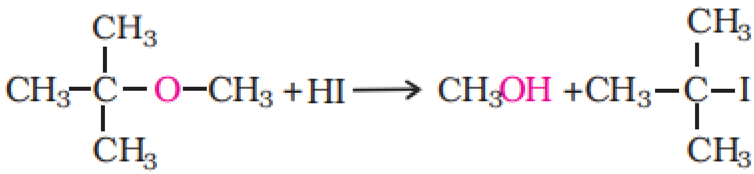
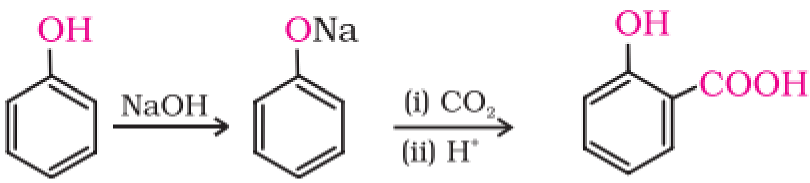
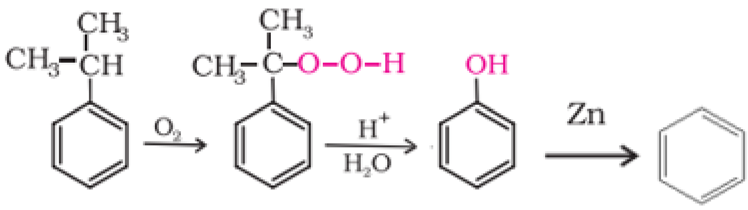
		1
18.	a) When electrophoresis, i.e., movement of particles is prevented by some suitable means, it is observed that the dispersion medium begins to move in an electric field. This phenomenon is termed electroosmosis. b) Once precipitated, lyophobic colloids do not give back the colloidal sol by simple addition of the dispersion medium. Hence, these sols are also called irreversible sols.	**1** **1**
19.	$\Lambda_m = \frac{k}{c} \, x \, 1000$ $= \frac{8 \, x \, 10^{-5}}{0.002} \, x \, 1000$ $= 40 \, Scm^2mol^{-1}$	½ ½ **1**
20.	a) $S + 2H_2SO_4(conc.) \rightarrow 3SO_2 + 2H_2O$ b) $2XeF_2\,(s) + 2H_2O(l) \rightarrow 2Xe\,(g) + 4\,HF(aq) + O_2(g)$ **OR** a)  b) 	**1** **1** **1** **1**
21.	a) $K_2[Mn(H_2O)_2(C_2O_4)_2]$ b) $[Cr(en)_3]_2(SO_4)_3$	**1** **1**
22.	a) $[Fe(H_2O)_6]Cl_3$ b) Hexaaquairon(III) chloride.	**1** **1**
23.	a) $CH_3CH_2CH_2Br$ (A) $CH_3CH_2CH_2I$ (B) b) $CH_3CH{=}CHCH_3$ (A) $CH_3CH(Br)CH(Br)CH_3$ (B)	½ + ½ ½ + ½
24.	Proteins are polymers of α-amino acids.	**1**

	They are classified as Fibrous and Globular proteins on the basis of their shape.	**1**
	OR	
	a) 	**1**
	b)   (*Any one*)	**1**
25.	a) $CH_3 – O – CH_2CH_3 + HI \rightarrow CH_3I + CH_3CH_2OH$	**1**
	b) *Step 1:* Formation of protonated alcohol.  *Step 2:* Formation of carbocation: It is the slowest step and hence, the rate determining step of the reaction.  *Step 3:* Formation of ethene by elimination of a proton.  	**1**
26.	$$d = \frac{zM}{a^3 N_A}$$	**1**
	For bcc, z = 2	½
	M = 154.1 $gmol^{-1}$	1½
	OR	

	 In Δ ABC $AC^2 = b^2 = BC^2 + AB^2$ $= a^2 + a^2 = 2a^2$ or $b = \sqrt{2}a$ If r is the radius of the sphere, we find $b = 4r = \sqrt{2}a$ or $a = \dfrac{4r}{\sqrt{2}} = 2\sqrt{2}r$ $\text{Packing efficiency} = \dfrac{\text{Volume occupied by four spheres in the unit cell} \times 100}{\text{Total volume of the unit cell}}\%$ $= \dfrac{4 \times (4/3)\pi r^3 \times 100}{(2\sqrt{2}r)^3}\%$ $= \dfrac{(16/3)\pi r^3 \times 100}{16\sqrt{2}r^3}\% = 74\%$	**3**
27.	$\dfrac{p_1^0 - p_1}{p_1^0} = \dfrac{w_2 \times M_1}{M_2 \times w_1}$ $\dfrac{23.75 - 23.375}{23.75} = \dfrac{5}{M_B} \times \dfrac{18}{95}$ Molar mass of solute = $\dfrac{5 \times 18}{95} \times \dfrac{23.75}{0.375} = 60\ g mol^{-1}$	**1** **1** **1**

28.	$E\,cell = E^0cell - \frac{0.0591}{n}\log\frac{[A^{2+}]}{[B^{2+}]}$ $2.6805 = E^0cell - \frac{0.0591}{2}\log 10^{-1}$ $= E^0cell - 0.0295 \times (-1)$ $= E^0cell + 0.0295$ $E^0cell = 2.6805 - 0.0295 = 2.651\ V$ $\Delta G^o = -nFE^o_{cell}$ $= -2 \times 96500 \times 2.651$ $= -\ 511643\ J\ mol^{-1}$ or $-511.643\ kJmol^{-1}$	**1** **1** **1**
29.	a) $t_{2g}^5\, e_g^0$ b) i) Hexacarbonylchromium(0) ii) d^2sp^3 iii) Diamagnetic iv) Low spin complex.	**1** ½ ½ ½ ½
30.	a) Benzene. In Chlorobenzene, aromatic ring is deactiated due to – I effect of chlorine. b) Benzyl chloride. Benzyl carbocation is stabilised by resonance. c) Pentan-2-ol. It contains a chiral carbon. **OR** a) Retention of configuration. b) Inversion of configuration. c) Racemisation	½ ½ ½ ½ ½ ½ **1** **1** **1**
31.	a) $k = \frac{2.303}{t}\log\frac{[R]_0}{[R]}$ $k = 0.0102\ mol^{-1}$ Time required for 80 % completion = 157.8 min. b) i) Rate increases by 8 times. ii) Rate increases by 9 times. **OR**	**1** **1** **1** **1** **1**

	a) (i) Order of reaction with respect to A is 0	½
	Order of reaction with respect to B is 2	½
	(ii) Rate law is	
	Rate = k $[B]^2$	½
	Overall order is 2	½
	(iii) Rate constant, k = 4.8 x 10^{-3} $mol^{-1}L\ s^{-1}$	**1**
	b) $k = \frac{[R]_0 - [R]}{t}$ At $t = t_{1/2}$, $[R] = \frac{1}{2}[R]_0$ The rate constant at $t_{1/2}$ becomes $k = \frac{[R]_0 - 1/2[R]_0}{t_{1/2}}$ $t_{1/2} = \frac{[R]_0}{2k}$	**2**
32.	a) Due to the presence of unpaired electron, d-d transition is possible.	**1**
	b) Due to more stable half filled d^5 configuration of Mn^{2+}.	**1**
	c) Fluorine and oxygen are highly electronegative and they have small size.	**1**
	d) Due to variable oxidation state (they form intermediate complexes).	**1**
	e) Due to greater number of unpaired electrons in d-orbitals, strong metallic bonding.	**1**
	OR	
	a) i) $2Cu^{2+} + 4I^- \rightarrow Cu_2I_2(s) + I_2$	**1**
	ii) $2Cu^+ \rightarrow Cu^{2+} + Cu$	**1**
	b) i) Cr^{3+}	**1**
	ii) Ti^{4+}	**1**
	iii) Fe^{2+}	**1**
33.	a) i) The higher boiling point of p-nitrophenol is due to intermolecular hydrogen bonding but in ortho nitrophenol, intra-molecular hydrogen bonding takes place.	**1**
	ii) The C-Br bond in bromobenzene is difficult to break because of partial double bond character (due to positive resonance).	**1**
	b) Ethanol < water < Phenol	**1**
	c) i) Heat both the compounds with iodine and NaOH, isopropyl alcohol gives yellow ppt of iodoform whereas n-propyl alcohol doesn't.	**1**
	ii) Add neutral ferric chloride solution to both the compounds, phenol gives violet colouration, whereas Benzyl alcohol doesn't. (Or any other test)	**1**

	OR	
	a) i) 	1
	ii) 	1
	iii) 	1
	b) i) 	1
	ii) 	1

Prepared by: The Department of Science 2020 -21	
Checked by: HOD – SCIENCE	