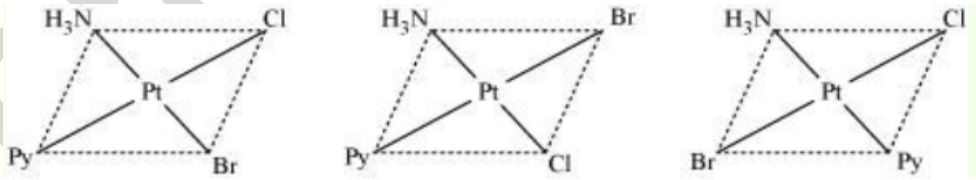
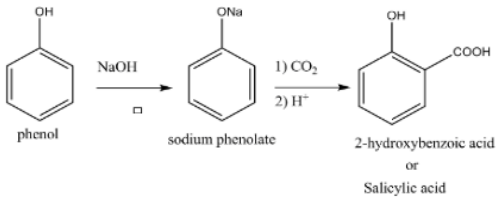
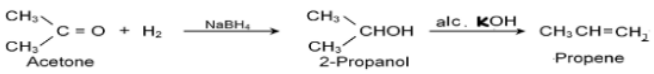
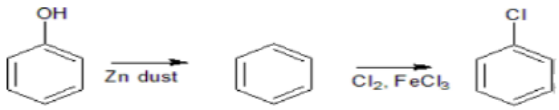
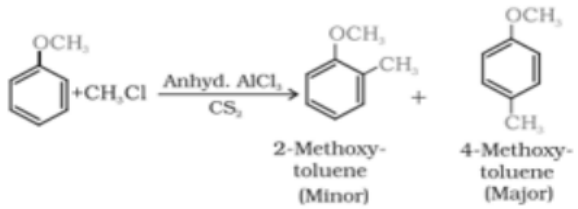
CHEMISTRY (CODE - 043)

SAMPLE QUESTION PAPER - 1

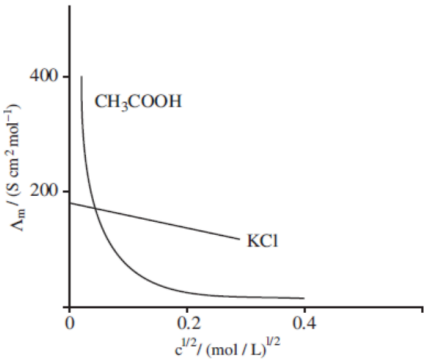
CLASS XII

Time: 3 hours **Max. Marks: 70**

Q.N	VALUE POINTS	MARKS
	SECTION - A	
1	(c)	1
2	(d)	1
3	(a)	1
4	(a)	1
5	(d)	1
6	(a)	1
7	(a)	1
8	(b)	1
9	(d)	1
10	(c)	1
11	(a)	1
12	(c)	1
13	(d)	1
14	(c)	1
15	(d)	1
16	(a)	1
	SECTION - B	
17	(a) On prolonged heating with HI, glucose gives n-hexane. (b) Glycosidic linkage **OR** (a) L configuration (b) Amino acids have an amino ($-NH_2$) group, basic in nature and accepts a proton and COOH group loses a proton forming a dipolar ion, called the Zwitter ion. In this form, amino acids behave both as acids and bases so they are amphoteric in nature	1 1 1 1
18	 From the above isomers, none will exhibit optical isomers.	½ x 4
19	(a) 4 times (b) 1/4th	1 1

20	$K = \frac{[A]_0 - [A]}{t}$ $t = \frac{0.10 - 0.075}{0.0030} = 8.33\ s$	½ ½ 1
21	(a) More is s character, more is electronegativity , more is polarity .C-Cl bond in cyclohexyl chloride is sp^3 hybridized having less s character as compared to C-Cl bond in chlorobenzene which is sp^2 hybridized. (b) To be miscible with water, the solute - water force of attraction must be stronger than solute - solute and water- water forces of attraction. Alkyl halides are held by dipole dipole interactions and strong H- bonds exist between the water molecules.The new forces of attraction between the alkyl halides and water molecules is weaker than the alkyl halide - alkyl halide and water - water forces of attraction. So alkyl halides are immiscible in water.	1 1
	SECTION - C	
22	P_{O2} = 10 x(20/100) = 2 atm x 760 = 1520 mm P_{N2} = 10 x (79/100) = 7.9 atm x 760 = 6004 mm $P = K_H \times X$ X_{O2} = 1520 / 3.30 x 10^7 = 4.61 x 10^{-5} X_{N2} = 6004 / 6,51 x 10^7 = 9.22 x 10^{-5}	½ ½ 1 ½ ½
23	**56 g of Fe requires 2 x 96500 C of electricity** **2.8 g —---------- 2 x 96500 x 2.8 / 56 = 9650 C** **Q=It , t = 9650 / 2 = 4825 s** **Faraday's second law** **W1/W2 = E1/E2** **2.8 / W2 = (56/2)/(65.3 /2)** **W= 3.265 g**	1 1 1
24	(i) Sodium phenoxide to o-hydroxybenzoic acid  (ii) Acetone to propene  (iii) Phenol to chlorobenzene  (iv) Anisole to 4-Methoxytoluene  	(3 x 1)

25	(a) Salicylic acid Reagents NaOH , CO2 , H+ Kolbe's reaction (b) Phenol	½ ½ 1 1
26	(a) +3 (b) d^2sp^3 , octahedral (c) paramagnetic (d) dichlorido bis(ethane-1,2 diamine) iron(III) chloride	½ 1 ½ 1
27	(a) In aniline, the lone pair of electrons on the N- atom is delocalized over the benzene ring due to resonance so less available for donation. (b) because it gives mixture of products so difficult to separate. (c) + R effect of NH_2 group increases electron density at ortho and para position.	1 1 1
28	(a) -NO_2 shows -I and -R effect .IT has tendency to attract the electron towards itself so it decreases the electron density between C-X bond. (b) due to symmetrical structure it better fits in the crystal lattice so m.pt is more. (c) By products are suplhur dioxide and HCl both are in the gaseous state.	1 1 1
	SECTION - D	
29	(a) Relative lowering of V.P =P^o-P/P^o = 0.061 / 17.5 = 0.00348 **OR** Vapour pressure of the solution = V.P of solvent - Lowering of V.P = 17.5 - 0.061 = 17.439 mm og Hg (b) Relative lowering of V.P =P^o-P/P^o= X(sugar) = 0.00348 (c) P^o-P/P^o= X(sugar) $\frac{P^o-P}{P^o} = \frac{W_B \times M_A}{M_B \quad WA}$ $\frac{17.5 - P}{17.5} = \frac{25 \times 18}{450 \quad 180}$ P = 17.40 mm of Hg	1 1 1 ½ ½ 1
30	(a) A = 100 so T = 100 C=150 so G = 150 Total nucleotides = 100+100+150+150 =500 (b) They studied the nucleotide composition of DNA. It was the same so they concluded that the samples belong to the same species. (c) A = T = 20% But G is not equal to C so double helix is ruled out. The bases pairs are ATGC and not AUGC so it is not RNA The virus is a single helix DNA virus **OR** According to Charagraff rule, all double helix DNA will have the same amount of A and T as well as C will be the same amount as G. If this is not the case then the helix is single stranded.	1 1 2 2
	SECTION - E	
31	**A:** (a) La_2O_3 is more ionic and Lu_2O_3 is covalent , as the size decreases covalent character increases. (b) As the size decreases from La to Lu , bond strength decreases so stability also decreases. (c) 5f electrons have poor shielding effect so nuclear charge is more . (d) Lanthanoid contraction (e) because of formation of chromate ion CrO_4^{2-} ion. **B:** (a) Mn^{+2} + 4 H_2O	1 x 5

	(b) Mn^{+3} is stronger O.A as it changes from Mn^{+3} to Mn^{+2} results in half filled d^5 config. . but Cr^{+3} is extra stable because of half filled t_2g level. (c) No. Enthalpy of atomisation of Zinc is 130kJ/mol because it has no unpaired electrons in d subshell so the interatomic interaction is weaker than Cu. (d) Sulphuric acid because hydrochloric acid is oxidised to chlorine (e) Chromium and Molybdenum	1 x 5
32	**(A)** (a) $\Lambda_m = \frac{1000 \times K}{M} S\ cm^2\ mol^{-1}$ $\Lambda_m = \frac{1000 \times 5.25 \times 10^{-5}}{2.5 \times 10^{-4}} S\ cm^2 mol^{-1}$ $= 210\ S\ cm^2 mol^{-1}$ $\Lambda^0_m\ HCOOH = \lambda^o HCOO^- + \lambda^o H^+$ $= (50.5 + 349.5)\ S\ cm^2 mol^{-1}$ $= 400\ S\ cm^2 mol^{-1}$ $\alpha = \Lambda_m / \Lambda^o_m$ $\alpha = 210/400$ $= 0.525$ (b) Dry cell is used in transistors At anode: $Zn(s) \rightarrow Zn^{2+} + 2e^-$ At cathode : $MnO_2 + NH_4^+ + e^- \rightarrow MnO(OH) + NH_3$ **OR** **(B)** (a) Molar Conductivity (Λm): It may be defined as the conductance of a solution containing 1 mole of electrolyte such that the entire solution is placed is between two electrodes one centimeter apart.  Molar conductivity increases with decrease in concentration or increase in dilution as the number of ions as well as mobility of ions increases with dilution. For strong electrolytes the number of ions do not increase appreciably on dilution and only mobility of ions increases due to decrease in inter-ionic attractions. Therefore Λm increases a little as shown in the graph by a straight line. For weak electrolytes the number of ions as well as mobility of ions increases on dilution so there is sharp increases in Λm. (b)	1 1 1 1 ½ ½ 1 1 1 ½ ½ 1

Here $E_{cell} = E^{o}_{cell} - \frac{0.0591}{n} \log \frac{[Cu^{2+}]}{[Ag^{+}]^2}$

Here $E^{o}_{cell} = 0.46\ V,\ n = 2$

$[Ag^{+}] = 0.001M = 1 \times 10^{-3}\ M, \qquad [Cu^{2+}] = 0.1M$

$$E_{cell} = 0.46 - \frac{0.0591}{2} \log \frac{0.1}{(10^{-3})^2}$$

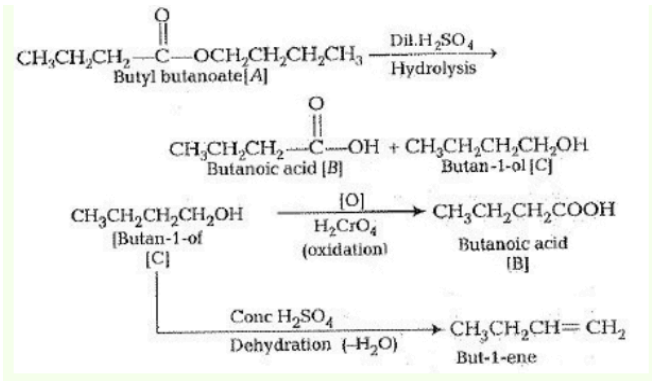
$$E_{cell} = 0.46 - \frac{0.0591}{2} \log 10^{5} = 0.46 - \frac{0.0591}{2} \times 5 \log 10$$

$E_{cell} = 0.46 - 0.0591 \times 2.5 \times 1 = 0.46 - 0.14775 = 0.31225V$

$E_{cell} = 0.312\ V$

33

(A) (a)



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(b)

(i) Because the –COOH group present in aromatic carboxylic acids is an electron withdrawing group causing deactivation of the benzene ring and anhydrous $AlCl_3$ get bonded with the carboxyl group.

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(ii) Because of -I and -R effect of the nitro group.

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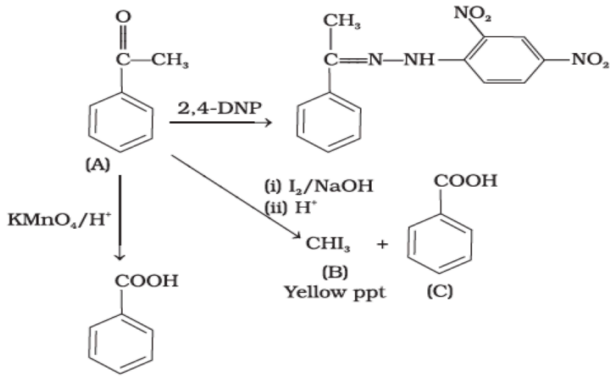
OR

(B) (a)



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(b) Benzoic acid (C) is more acidic than acetophenone (A) because of resonance stabilization of carboxylate ion.

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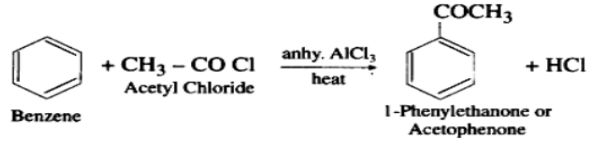
(c)



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