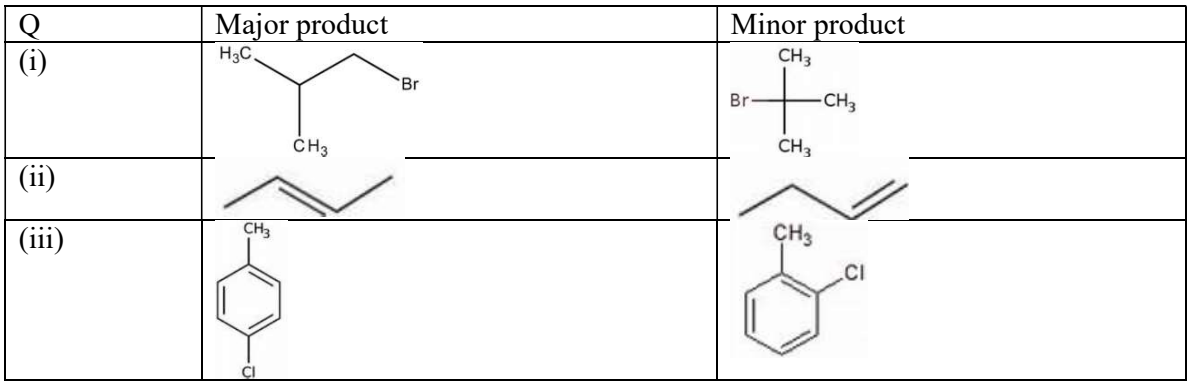
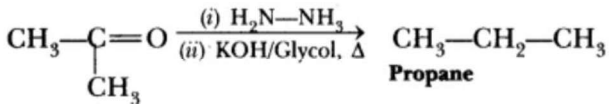
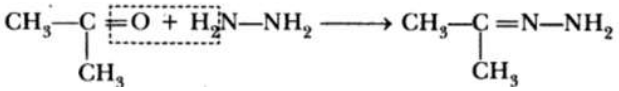
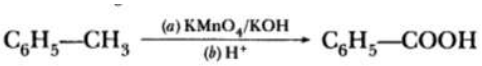
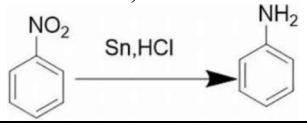
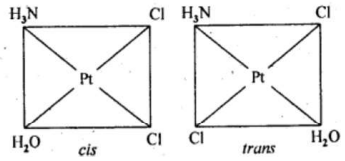
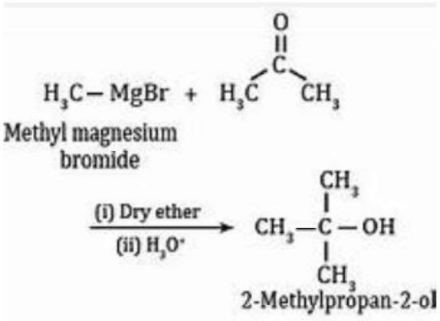
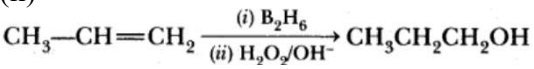
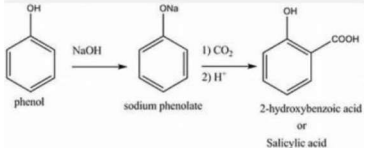
KENDRIYA VIDYALAYA SANGATHAN, BENGALURU REGION
FIRST PREBOARD EXAMINATION (2024-25)

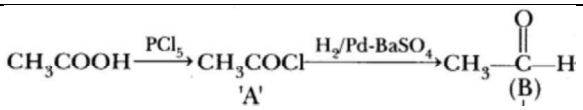
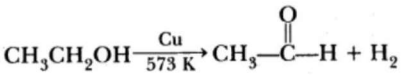
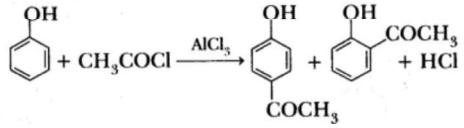
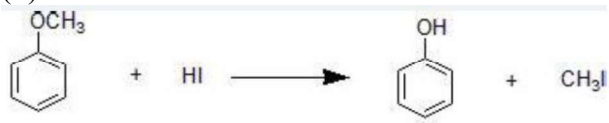
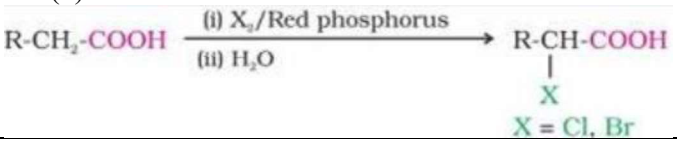
CLASS: XII MAX MARKS: 70
SUBJECT: CHEMISTRY MARKING SCHEME TIME: 3 HOURS

	SECTION A	
1	b) Gabriel phthalimide synthesis	1
2	(a)CH_3CH_2Cl	1
3	(d)Zn	1
4	(a)Acetic acid	1
5	(c)0.015	1
6	(d)Sodalime & Zinc dust	1
7	(c) $C_2O_4^{2-}$	1
8	(a)Simple sugar	1
9	(d) 8 and 4	1
10	(c) (i) & (iv)	1
11	(d) $(C_2H_5)_2NH > (C_2H_5)_3N > C_2H_5NH_2 > NH_3$	1
12	(d)Pentan-3-one	1
13	(b)Both A and R are true but R is not the correct explanation of A.	1
14	(a) Both A and R are true and R is the correct explanation of A	1
15	(d)A is false but R is true.	1
16	(c)A is true but R is false.	1
	SECTION B This section contains 5 questions with internal choice in one question. The following questions are very short answer type and carry 2 marks each.	
17	Henry's Law - The partial pressure of the gas in vapour phase is proportional to the mole fraction of the gas in the solution. Any one applications of Henry's Law OR Raoult's Law - For any solution, the partial vapour pressure of each volatile component in the solution is directly proportional to its mole fraction. Example : n-hexane and n-heptane / bromoethane and chloroethane / benzene and toluene / any other correct example	1 1 1 1
18	(i) $[CO(NH_3)_4(H_2O)_2]Cl_3$. (ii) Potassium tetracyanidonickelate(II)	1 1
19	(i) $H_2 - O_2$ fuel cell (ii) High efficiency/ environment friendly	1 1
20		1 1

	1	
21	(i) The two cyclic hemiacetal forms of glucose differ only in the configuration of the hydroxyl group at C1. (ii)Glucose does not give Schiff's test / does not form the hydrogensulphite addition product with $NaHSO_3$ / The pentaacetate of glucose does not react with hydroxylamine/ Glucose is found to exist in two different crystalline forms (Any two)	1 ½ ½
	SECTION C This section contains 7 questions with internal choice in one question. The followingquestions are short answer type and carry 3 marks each.	
22	(i) The limiting molar conductivity of an electrolyte is equal to the sum of individual limiting molar conductivities of the cations and anions which make up the electrolyte. (ii) $\lambda^O CH_3COOH = \lambda^O CH_3COONa + \lambda^O HCL - \lambda^O NaCl$ $= 91+426.16-126.45$ $=390.71\ Scm^2/mol$	1 1 ½ ½
23	(i)$2\ MnO_2 + 4\ KOH + O_2 \rightarrow 2\ K_2MnO_4 + 2\ H_2O$ $2\ K_2MnO_4 + 2\ H_2O \rightarrow 2\ KMnO_4 + 2\ KOH + H_2$ (ii)$2KMnO_4 \rightarrow\ K_2MnO_4 + MnO_2 + O_2$	1 1 1
24	(i) (a) C_6H_5CHO, CH_3CHO, HCHO (b) HCOOH, $ClCH_2COOH$, CCl_3COOH, CF_3COOH (ii)  **Propane** OR (i) (a)  (b)  (iii) Silver mirror will be formed/ reaction Tollens reagent acts as oxidising agent.	 1 1 1 1 1 ½ ½

25	(i) β-D-galactose and β -D-glucose. (ii) Nucleosides contain only sugar and a base whereas Nucleotides contain sugar, base and a phosphate group (iii)Essential amino acids must be obtained through diet. Ex : **leucine/ valine/any other** **Non-essential amino acids** are amino acids that the body can synthesize on its own, **Ex:** Glycine/ alanine/any other	1 1 1
26	(i) 2-methyl prop-2-en-l-ol (ii) (a) Due to electron withdrawing effect of nitrogroup, p-nitrophenoxide ion is more stable than p-methyl phenoxide ion. (b) Being an S_N2 reaction, best results are obtained with primary alkyl halides or methyl halides due to less steric hinderance. Tertiary alkyl halides undergo elimination.	1 1 1
27	(i) Increasing order of boiling points : (c) < (a) < (b) (ii) In SN_1 reaction, formation of carbocation as an intermediate takes place. This carbocation has sp^2-hybridised and planar structure. This planar carbocation is attacked by nucleophile from both the sides equally to form *d* and *l* isomers in equal proportion. Such products are called racemic mixture. Hence, S_N1 reactions are accompanied by racemisation in optically active alkyl halides. Any one example	1 1 1
28	(i)conductivity of an electrolytic solution at any given concentration is the conductance of one unit volume of solution kept between two platinum electrodes with the unit area of cross-section and at a distance of unit length. (ii)Conductivity of HCl decreases on dilution as number of ions per unit volume decreases. (iii) Conductivity = cell constant / resistance $K=1/R\times G^*$	1 1 1
	SECTION D The following questions are case-based questions. Each question has an internal choice and carries 4 (2+1+1) marks each. Read the passage carefully and answer the questions that follow.	
29	(i) $t = \frac{1}{K}[(A)_0 - (A)]$ $t = \frac{1}{0.003}[(0.10) - (0.075)]$ $t = \frac{1}{0.003} \times 0.025 = \frac{25}{3} = 8.3 seconds$ (ii)The molecularity of a reaction is the number of atoms, ions, or molecules that must collide with one another simultaneously in order for products to be formed in an elementary reaction. OR The half-life of a reaction is the amount of time needed for a reactant concentration to decrease by half compared to its initial concentration. (iii) $\frac{dx}{dt} = k[A]^2[B]^1$	½ 1 ½ 1 1
30	(i)(a)A = KI , B = Benzene (b) Azodye Test / any other Test to distinguish aniline and ethylene amine. (ii)Any correct sequence of steps showing conversion of nitrobenzene to aniline.Ex using Sn/Zn/Fe + HCl or H_2,Pd 	½ ½ 1 1

	OR Products formed are $C_2H_5-OH + N_2 \uparrow + HCl$ Ethanol (iii)Aniline being basic forms salt with the catalyst $AlCl_3$ which acts as lewis acid.	 1
	SECTION E The following questions are long answer types and carry 5 marks each. All questionshave an internal choice.	
31	(i) (a) variable oxidation states/ ability to form complexes/provide greater surface area (any two) (b)similar atomic radii/size (ii) (a) In $[Ni(CN)_4]^{2-}$ ion,Ni^{2+} ion has outer electronic configuration of $3d^8$. Two unpaired electrons in the 3d orbitals pair up.dsp^2 hybridisation- square planar (b)  OR (i) (a) small ionic size, high charge density & presence of vacant d orbitals (any two) (b) d- d transition (ii) (a) In aqueous solution, $[Co(NH_3)_5Cl]SO_4$ provides SO_4^{2-} ions which will give a white ppt of $BaSO_4$ on adding $BaCl_2$ solution while $[Co(NH_3)_5SO_4]Cl$ provides Cl^- ions and will give white ppt of AgCl with $AgNO_3$ solution. (b) $[FeF_6]^{3-}$ sp^3d^2 hybridisation/outer orbital complex with 5 unpaired electrons (Fe^{3+}) makes the complex highly paramagnetic.	1 1 1 ½ ½ 1 1 2 1
32	(i)  (ii)  (iii) Kolbe's reaction is a carboxylation reaction that converts phenols to aromatic hydroxy acids using carbon dioxide and sodium hydroxide.  (iv)	1 1 1 1 +1

	 OR (i) (a) Ethanal is formed.  (b) 4-hydroxy acetophenone and 2-hydroxy acetophenone are formed  (ii)  (iii) (a) CH_3CHO , C_2H_5OH , CH_3COOH (b) 	1 1 1 1 1
33	(i) $\Delta T_b = ik_b\ m$ $= 2 \times 0.512 \times 0.1$ $= 0.512/5 = 0.1024\ ^{O}C$ (ii) When salt is spread over snow covered roads, snow starts melting from the surface because of depression in freezing point of water and it helps in clearing the roads. (iii) $P_B = P^{O}_B\ X_B = 40 \times 0.4 = 16mm$ $P_{total} = P_B / Y_B = 16 / 0.25 = 64$ mm $P_A = P$ total $- P_B = 64 - 16 = 48$ mm $P^{O}_A = P_A / X_A = 48 / 0.6 = 80$ mm OR (i) In A, the cell is placed in a hypotonic solution and it swells due to inflow of water molecules up by osmosis. In B, the cell is placed in a hypertonic solution and it shrinks due to outflow of water molecules by osmosis. (ii) Salts and excess minerals are removed from seawater (desalination)/ Purification of rainwater/Concentrating fruit juices/ any other application (iii) $\Pi V = nRT$ $\Pi V = (w/M)\ RT$ $0.025 \times 1 = (5/M) \times 0.0821 \times 300$ $M = 4926u$	½ 1 ½ 1 ½ ½ ½ ½ ½ ½ 1 ½ 1 ½