#

# UDAYA PUBLIC SCHOOL, AYODHYA HALF YEARLY EXAMINATION-2022-23

**Time-3hrs. Class XII(Chemistry) Total Marks: 70**

**Note: All questions are compulsory**

# Section A( 1 mark each)

1. Suggest a list of metals which can be extracted electrolytic-ally.
2. Suggest two materials other than hydrogen that can be used as fuels in the fuel cells.

 3- What is spectrochemical series?

1. What is crystal field splitting energy?
2. Write structure of the following compound: 1-Bromo-4-sec. butyl-2-methylbenzene. 6- 6- Why is sulphuric acid not used during the reaction of alcohols with KI?
3. Arrange each set of compounds in order of increasing boiling points : Bromomethane, bromoform, chloromethane, dibromomethane
4. Name the following compound according to IUPAC system.
5. Write the equations involved in the Reimer-Tiemann reaction.
6. Explain why propanol has higher boiling point than that of the hydrocarbon, butane?
7. Arrange the following carbonyl compounds in increasing order of their reactivity in nucleophilic addition reactions : Ethanal, propanal, propanone, butanone
8. Give the IUPAC names of the following compound : PhCH2CH2COOH
9. Which acid from the following pair would you expect to be a stronger acid?
 CH2FCH2CH2COOH or CH3CHFCH2COOH
10. What is meant by cyanohydrins? 15-What are SN1&SN2 reactions?
11. Write structure of the following compound: N-Phenylbenzamide

#  Section-B(2 marks each)

1. State Henry’s law and mention some of its important applications.
2. Calculate the potential of hydrogen electrode in contact with a solution whose pH is 10.
3. The molar conductivity of 0.025 mol L-1 methanoic acid is 46.1 S cm2 mol-1. Calculate its degree of dissociation and dissociation constant Given λ°(H+)=349.6 S cm2 mol-1 andλ°(HCOO-) = 54.6

S cm2 mol-1

1. What is meant by the chelate effect? Give an example.
2. A hydrocarbon C5H10 does not react with chlorine in dark but gives a single monochloro compound C5H9Cl in bright sunlight. Identify the hydrocarbon.
3. What is meant by hydroboration-oxidation reaction? Illustrate it with an example.

# Section-C (3marks each)

1. Calculate (a) molality(b) molarity and

(c) mole fraction of KI if the density of 20% (mass/mass) aqueous KI solution is 1·202 g mL-1. (M.M.of KI = 166gm/mol)

1. Write the chemistry of recharging the lead storage battery, highlighting all the materials that are involved during recharging.
2. Explain on the basis of valence bond theory that [Ni(CN)4]2- ion with square planar structure is diamagnetic and [NiCl4]2- ion with tetrahedral geometry is paramagnetic.
3. FeSO4 solution mixed with (NH4)2SO4 solution in 1 : 1 molar ratio gives the test of Fe2+ ion but CuSO4 solution mixed with aqueous ammonia in 1 : 4 molar ratio does not give the test of Cu2+ ion. Explain why?
4. Write the equations for the preparation of 1-iodobutane from (i)1-butanol (ii)1-chlorobutane (iii) but-l-ene.
5. Give the equations of the reaction for the preparation of phenol from cumene.
6. Predict the product when cyclohexanecarbaldehyde reacts with following reagents :

(i) C6H5MgBr followed by H3O+ (ii) Tollen’s reagent

(iii) Semicarbazide in the weakly acidic medium

1. (i) Write the structures of different isomeric amines corresponding to the molecular formula, C4H11N.

 (ii) Write the IUPAC names of all the isomers

 (iii) What type of isomerism is exhibited by different types of amines?

1. Write IUPAC names of the following compounds and classify them into primary, secondary, and tertiary amines. (i) (CH3)2 CHNH2 (ii) CH3(CH2)2NH2 (iii) CH3NHCH(CH3)2

# Section-D (5 marks each)

1. (a)According to Raoult’s law, what is meant by positive and negative deviations and how is the sign of ∆solH related to positive and negative deviations from Raoult’s law? 2

(b) A solution containing 30g of non-volatile solute exactly in 90 g of water has a vapour pressure of

2.8 kPa at 298 K. Further, 18g of water is then added to the solution and the new of vapour pressure becomes 2.9 kPa at 298 K. Calculate

1. molar mass of the solute.
2. vapour pressure of water at 298 K. 3
3. (a) Define conductivity and molar conductivity for the solution of an electrolyte. Discuss their variation with concentration. 2

(b) Three electrolytic cells A, B, C containing solutions of ZnS04, AgNO3 and CuS04, respectively are connected in series. A steady current of 1.5 amperes was passed through them until 45 g of silver deposited at the cathode of call B. How long did the current flow? What mass of copper and zinc were deposited? 3

1. Which of the following compounds would undergo aldol condensation, which the Cannizzaro

reaction and which neither? Write the structures of the expected products of aldol condensation and

Cannizzaro reaction. 5

(i) Methanal (ii) 2-Methylpentanal (iii) Benzaldehyde. (iv) Benzophenone (v) Cyclohexanone