Roll No.....

Total No. of Questions : 4] [Total No. of Printed Pages : 8

12th ARNKD(W/Z) JKLUT-2025

1109-A

CHEMISTRY

(Theory)

Time : 3 Hours] **[Maximum Marks : 70**

Note:- **"Attempt any 60 Marks out of 70 Marks".**

SECTION-A

(Multiple Choice Questions)

(1 mark each)

1. Choose the correct answer and write in your answer book

(i) Ethylenediamine is an example of a ..... Ligand.

(a) Monodentate (b) Bidentate

(c) Tridentate (d) Tetradentate

(ii) Facial and meridional isomerism will be exhibited by

(a) $[Co\ (NH_3)_3Cl_3]$

(b) $[Co\ (NH_3)_4Cl_2]\ Cl$

(c) $[Co\ (NH_3)_5Cl]\ Cl_2$

(d) $[Co\ (en)_3]\ Cl_3$

(iii) Which concentration term of a solution remains independent of Temperature?

(a) Molarity

(b) Normality

(c) Molality

(d) Formality

(iv) Which one of the following is not a colligative property?

(a) Elevation of boiling point

(b) Depression in freezing point

(c) Vapour pressure

(d) Osmotic pressure

(v) Conductivity of 0.01 M NaCl solution is 0.00147 ohm^{-1} cm^{-1}. What happens to this conductivity if extra 100 ml of H_2O will be added to the above solution?

(a) Increases

(b) Decreases

(c) Remains unchanged

(d) First increases and then decreases

(vi) $C_3H_8 + Cl_2 \rightarrow C_3H_7Cl + HCl$ is an example of:

(a) Addition reaction

(b) Substitution reaction

(c) Reərrangement reaction

(d) Elimination reaction

(vii) Picric Acid is:

(a) 2,4,6-Trinitrotoluene

(b) p-Bromophenol

(c) Trinitroaniline

(d) 2,4,6-trinitrophenol

(viii) Both Aliphatic and Aromatic aldehydes can be oxidised by

(a) Fehling's solution

(b) Benedict's solution

(c) Tollen's reagent

(d) Fehling's solution and Benedict's solution

(ix) Proteins are polyamides of:

(a) Beta-Amino acids

(b) Alpha-Amino acids

(c) Alpha-Hydroxy acids

(d) Beta-Hydroxy acids

(x) Nucleic acids are the polymers of:

(a) Nucleosides

(b) Nucleotides

(c) Bases

(d) Sugars

SECTION-B

(Very Short Answer Type Questions)

(2 marks each)

2. (i) For a zero-order reaction will the molecularity be equal to zero?

(ii) Define the following terms:

(a) Mole fraction (b) Isotonic solutions

(iii) Which of the following is more stable complex and why?

$[Co(NH_3)_6]^{3+}$ and $[Co(en)_3]^{3+}$

(iv) Write down the electronic configuration of:

(a) Mn^{2+} (b) Fe^{2+}

(v) What are the different oxidation states exhibited by the lanthanoids?

(vi) Why phenols are more acidic than alcohols?

(vii) How will you convert ethanal into Butane 1, 3-diol?

(viii) What kind of aldehydes and ketones undergo the Cannizaro reaction?

(ix) Which monosaccharides we get upon the hydrolysis of:

(a) Sucrose (b) Starch

SECTION-C

(Short Answer Type Questions)

(3 marks each)

3. (i) Define electrode potential. What are the factors which affect the electrode potential?

(ii) Define the following terms:

(a) Molal depression constant (K_f)

(b) Molal elevation constant (K_b)

(iii) Name the following coordination compounds according to IUPAC system of nomenclature:

(a) $[Co(NH_3)_4(H_2O)Cl]Cl_2$

(b) $K_2[NiCl_4]$

(c) $[Cr(NH_3)_2Cl_2(en)]Cl$

(iv) What are the characteristics of the transition elements and why are they called transition elements? Which of the d-block elements may not be regarded as the transition elements?

(v) How does the phenol react with Bromine (Br_2) in

(a) Aqueous medium

(b) Less polar solvent like CS_2

(vi) What is Aldol condensation? Explain with an example.

(vii) How amines are prepared from nitro-compounds and nitriles?

(viii) Why aromatic amines are weaker bases than aliphatic amines?

(ix) What are carbohydrates and how are they classified on the basis of their behaviour on hydrolysis?

SECTION-D

(Long Answer Type Questions)

(5 marks each)

4. (i) Explain why Aryl halides are less reactive than haloalkanes towards nucleophilic substitution reaction.

OR

Write the products formed when chlorobenzene under-goes the following reactions.

(a) Halogenation

(b) Nitration

(c) Suphonation

(d) Friedel-Crafts alkylation with Methyl chloride

(e) Friedel-Crafts acylation with acetyl chloride

(ii) Discuss in detail the various factors which influence the rate of reaction?

OR

State and explain Arrhenius equation. How the activation energy of a reaction can be determined by using this equation?

(iii) Define molar conductivity of a substance. Explain how for weak and strong electrolytes, molar conductivity changes with dilution.

OR

State the following laws :

(a) Faraday first law of electrolysis

(b) Kohlrausch's law of independent migration of ions.

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