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Total No. of Questions : 4]

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12thARNKD(W/Z) JKLU-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

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Turn Over

- (ii) Facial and meridional isomerism will be exhibited by
- (a) $[\text{Co}(\text{NH}_3)_3\text{Cl}_3]$
 - (b) $[\text{Co}(\text{NH}_3)_4\text{Cl}_2]\text{Cl}$
 - (c) $[\text{Co}(\text{NH}_3)_5\text{Cl}]\text{Cl}_2$
 - (d) $[\text{Co}(\text{en})_3]\text{Cl}_3$
- (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 $0.00147 \text{ ohm}^{-1} \text{ cm}^{-1}$.
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) $\text{C}_3\text{H}_8 + \text{Cl}_2 \rightarrow \text{C}_3\text{H}_7\text{Cl} + \text{HCl}$ is an example of:
- (a) Addition reaction
 - ☒ (b) Substitution reaction
 - (c) Rearrangement 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?
 $[\text{Co}(\text{NH}_3)_6]^{3+}$ and $[\text{Co}(\text{en})_3]^{3+}$
- (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) $[\text{Co}(\text{NH}_3)_4(\text{H}_2\text{O})\text{Cl}]\text{Cl}_2$
 - (b) $\text{K}_2[\text{NiCl}_4]$
 - (c) $[\text{Cr}(\text{NH}_3)_2\text{Cl}_2(\text{en})]\text{Cl}$
- (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
- Aqueous medium
 - 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.

- Halogenation
- Nitration
- Suphonation
- Friedel-Crafts alkylation with Methyl chloride
- 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.
