

Quarterly Examination -2024-25

Chemistry

Class – 12 th

Time – 3 hrs

Set- A

Marks-70

INSTRUDUCTIONS:

- 1- All Questions are compulsory.
- 2- Q.No.S.1 to 5 are Objective type questions carry total 28 Marks
- 3- Q.No 6 to 12 each question carries 2 marks (word limit 30 words)
- 4- Q.No 13 to 16 each question carries 3 marks (word limit 75 words)
- 5- Q.No 17 to 20 each question carries 4marks(word limit 120 words)
- 6- Internal Choice is given in each question from question No.6 to 20

Q.1 Choose and write correct options-

(1x 6 =6)

- i Vant Hoff factor (i) for Na_2SO_4 , KCL and $\text{Al}_2(\text{SO}_4)_3$ respectively are–
a) 3,2,5 b) 2,1,5 c) 6,2,6 d) 2,3,5
- ii In electro chemical , $\text{Zn}|\text{Zn}^{2+}||\text{Cu}^{2+}|\text{Cu}$ the Species undergoing reduction is-
a) Zn b) Cu^{2+} c) Zn^{2+} d) Cu
- iii Isomerism exhibited by the complex compound $[\text{Co}(\text{NH}_3)_5\text{NO}_2]\text{Cl}_2$ and $[\text{Co}(\text{NH}_3)_5\text{ONO}]\text{Cl}_2$ is-
a) Ionisation isomerism b) linkage isomerism c) Hydrate isomerism
d)Co-ordination isomerism
- iv The number of unpaired electrons in Ni^{2+} is-
a) 0 b) 2 c) 1 d) 4
- v The Oxidation number of cobalt in $\text{K}[\text{Co}(\text{CO})_4]$ is-
a) +1 b) +3 c) +2 d) -1
- vi Which of the following alkyl halide is most reactive towards SN^1 reaction-
a) $(\text{CH}_3)_3\text{C-F}$ b) $\text{CH}_3\text{-CH}_2\text{-Br}$ c) $(\text{CH}_3)_3\text{C-I}$ d) $\text{CH}_3\text{-Cl}$

Q 2 Fill in the blanks.

(1x 6 =6)

1. Solutions of similar osmotic pressure are know as-----

2. Reciprocal of Specific resistance is known as-----
3. KMnO_4 is strong -----
4. Chlorofluoro derivatives of methane and ethane are called-----
5. Ethane-1,2-diamine is-----ligand .
6. The general electronic configuration of Transition element is -----

Q.3 Write True or False .

(1x 6 =6)

- I. On adding Non-Volatile Solute to a solvent vapour pressure increases.
- II. EDTA is a Tridentate ligand.
- III. On dilution molar conductivity decreases
- IV. Actinoid contraction is smaller than lanthanoid contraction
- V. C-X bond is Non- polar in alkyl halides.
- VI. $[\text{Ni}(\text{CN})_4]^{2-}$ is a square planar

Q.4 Match the pairs Correctly

(1x 6 =6)

" A "	" B "
I. Phosgene	1. +4
II. Ce	2. d^2sp^3
III. $\text{Cu}^{2+} + 2\text{e}^- \rightarrow \text{Cu}$	3. 2F
IV. Ethylene glycol	4. sp^3d^2
V. $[\text{Co}(\text{NH}_3)_6]\text{Cl}_3$	5. CoCl_2
	6. Antifreeze

Q.5 Answer in one word /sentence

(1x 5 =5)

- I. Write the electronic configuration chromium
- II. What is asymmetric carbon.
- III. The total number of ions given by the complex $[\text{Cr}(\text{H}_2\text{O})_6]\text{Cl}_3$ in water.
- IV. Calculate the mass percentage of benzene if 22g of benzene is dissolved in 122g of carbon tetrachloride.
- V. Write the name of a cell used in hearing aids

Q.6 Write the definition of abnormal molar mass.

2

Or

What is the effect of temperature on molarity ?

Q.7 Define cell constant and give its unit ?

2

Or

Define Resistivity and give its unit ?

Q.8 Transition element easily formed alloy give reason

2

Or

Transition element generally formed coloured compound .give reason

Q.9 Draw figure to show the splitting of d-orbitals in an octahedral crystal field . 2

Or

Write the definition of crystal field splitting energy (CFSE)

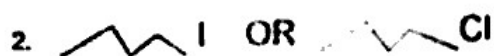
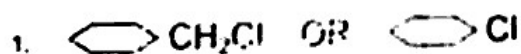
Q.10 Write the following reaction with chemical equation

2

(i) Sandmeyer's reaction (ii) Fitting reaction

Or

In the following pairs of halogen compounds which would undergo SN^2 reaction.



Q.11 Transition metal exhibits highest oxidation state in oxides and fluorides .Give reason.

2

OR

Zr and Hf have almost same atomic radius .Give reason

Q 12 Write two difference between double salt and a complex salt ?

OR

Explain the difference between a weak field ligand and a strong field ligand

Q 13 What do you mean by ideal and Non ideal Solution, explain with Example

Or

2

What is Raoult's law ? Derive Raoult's law for solution which contain Non-Volatile solute

Q 14 How much charge is required for following reductions.

3

1) 1 mol Al^{3+} to Al 2) 1 mol MnO_4^- to Mn^{2+}

OR

Λ°_m for NaCl , HCl and NaAc are 126.4 , 425.9 and $91.0 \text{ ohm}^{-1}\text{cm}^2\text{mol}^{-1}$ respectively calculate Λ°_m for HAc ?

Q 15 Write the IUPAC Names of the following Co.ordination compounds.

3

- i. $[\text{Cr}(\text{H}_2\text{O})(\text{CN})(\text{en})]$
- ii. $\text{K}_2[\text{Zn}(\text{OH})_4]$
- iii. $[\text{Fe}(\text{CO})_5]$

OR

Write the formulas for the following Co.ordination compounds

- i. Tetraamminediaqua cobalt (III) Chloride.
- ii. Potassium trioxalatoaluminate (III)
- iii. Tetrabromidocuprate (II)

Q.16 Haloalkanes react with KCN to form alkyl cyanides as main product while AgCN from isocyanides as the chief product explain.

3

OR

Aryl halides are extremely less reactive towards Nucleophilic Substitution reactions give three reason

Q.17 State Henry's law if N_2 gas is bubbled through water at 293K, How many millimoles of N_2 gas would dissolve in 1 litre of water. ? Assume that N_2 exerts a partial pressure of 0.987 bar .Give that Henry's law Constant for N_2 at 293k is 76.48 bar

4

OR

What do you understand by molal elevation constant the boiling point of benzene is 353.23K when 1.80g of a Non-volatile solute was dissolved in 90g of benzene ,the boiling point is raised to 354.11k.calculate the molar mass of the solute k_b for benzene is $2.53\text{ k kg mol}^{-1}$

Q.18 Write and derive Nernst equation

4

OR

Explain how rusting of iron is envisaged as setting up of an electrochemical cell.

Q.19 Compare the chemistry of the actinoids with that of lanthanoids with reference to . <https://www.mpboardonline.com>

4

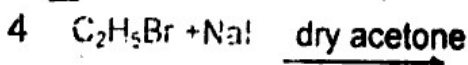
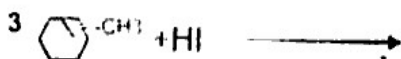
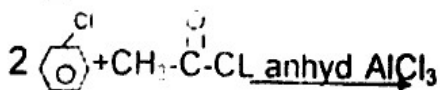
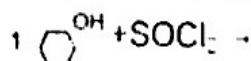
- | | |
|-----------------------------|----------------------|
| i) electronic configuration | ii) oxidation states |
| iii) Complex formation | iv) Radioactivity |

OR

Write any four differences between d-block and f block elements.

Q.20 Complete and write the following reactions

4



OR

What happens when

- i. n-butyl chloride is treated with alcoholic KOH.
- ii. Methyl iodide is treated with sodium in the presence of dry ether
- iii. Chlorobenzene is treated with HNO_3 in the presence of conc. H_2SO_4
- iv. Ethene reacts with bromine in the presence of carbon tetrachloride.