

## IMPORTANT QUESTIONS IN CHEMISTRY XII STD

### LESSON -1 METALLURGY

#### BOOK BACK QUESTIONS:

1. What is the difference between minerals and ores?
2. Which type of ores can be concentrated by froth floatation method?
3. Describe a method for refining nickel.
4. Explain zone refining process with an example.
5. Give the uses of zinc.
6. Explain the following terms with suitable examples. i) Gangue ii) Slag
7. Give the basic requirement for vapour phase refining.
8. Explain the principle of electrolytic refining with an example.
9. Limitations of Ellingham diagram.
10. What is the role of Limestone in the extraction of Iron from its oxide  $\text{Fe}_2\text{O}_3$ ?

#### BOOK INTERIOR:

1. What is roasting?
2. Define Calcination.
3. What is smelting?
4. Explain Van-Arkel method.

### LESSON -2 P-BLOCK ELEMENTS-I

#### BOOK BACK QUESTIONS:

1. Write a short note on anomalous properties of the first element of p-block.
2. Give the uses of Borax.
3. What is catenation? Describe briefly the catenation property of carbon.
4. Write a note on Fischer Tropsch synthesis.
5. Give the uses of silicones.
6. Describe the structure of diborane.
7. Write a short note on hydroboration.
8. How will you identify borate radical?
9. How will you convert boric acid to boron nitride?
10. CO is a reducing agent, justify with an example.
11. Write a note on zeolites.

#### BOOK INTERIOR:

1. Give the uses of Boric acid.
2. Structure Boric acid

### LESSON -3 P-BLOCK ELEMENTS-II

#### BOOK BACK QUESTIONS:

1. What is the inert pair effect?
2. Why fluorine is more reactive than other halogens?
3. Give the uses of helium.
4. What is the hybridisation of iodine in  $\text{IF}_7$ ? Give its structure.
5. Give the uses of sulphuric acid.
6. Give a reason that sulphuric acid is a dehydrating agent.
7. What type of hybridisation occur in a)  $\text{BrF}_5$  b)  $\text{BrF}_3$

8. Write the molecular formula and structural formula for the following molecules a) Nitric acid b) dinitrogen pentoxide c) phosphoric acid d) phosphine
9. Give the balanced equation for the reaction between chlorine with cold NaOH and hot NaOH.
10. What are interhalogen compounds? Give examples.

#### BOOK INTERIOR:

1. How is chlorine is manufactured by Deacon's process?
2. How is bleaching powder prepared?
3. Write about Holmes signal.
4. Give the test for sulphate / sulphuric acid.
5. HF acid is not stored in glass bottles why?
6. Mention the characteristic of interhalogen compounds.

### LESSON -4 TRANSITION AND INNER TRANSITION ELEMENTS

#### BOOK BACK QUESTIONS:

1. Explain the oxidation states of 4d series elements.
2. What are inner transition elements?
3. Justify the position of lanthanides and actinides in the periodic table.
4. Describe the preparation of potassium dichromate.
5. What is lanthanide contraction and what are the effects of lanthanide contraction
6. What are interstitial compounds?
7. Which is more stable?  $\text{Fe}^{3+}$  or  $\text{Fe}^{2+}$  – explain.
8. Compare lanthanides and actinides.

#### BOOK INTERIOR:

1. State Hume – Rothery rule for alloy formation.
2. Why do transition elements and its compounds act as catalyst
3. Explain Ziegler-Natta catalyst.
4. Explain Chromyl chloride test.
5. Write the oxidizing property of  $\text{K}_2\text{Cr}_2\text{O}_7$ .

### LESSON -5 COORDINATION CHEMISTRY

#### BOOK BACK QUESTIONS:

1. What is linkage isomerism? Explain with an example.
2. Write the postulates of Werner's theory?
3. What are hydrate isomers? Explain with an example.
4. What is crystal field splitting energy?
5. What are the limitations of VB theory?

- Discuss briefly the nature of bonding in metal carbonyls.
- Give an example of a coordination compound used in medicine and two examples of biologically important coordination compounds.
- Give one test to differentiate  $[\text{Co}(\text{NH}_3)_5\text{Cl}]\text{SO}_4$  and  $[\text{Co}(\text{NH}_3)_5\text{SO}_4]\text{Cl}$
- Give the difference between double salts and coordination compounds.
- Why tetrahedral complexes do not exhibit geometrical isomerism
- What is crystal field stabilization energy?

- $[\text{Sc}(\text{H}_2\text{O})_6]^{3+}$  is colourless why?
- Based on VB theory explain why  $[\text{Cr}(\text{NH}_3)_6]^{3+}$  is paramagnetic, while  $[\text{Ni}(\text{CN})_4]^{2-}$  is diamagnetic.

**BOOK INTERIOR:**

- Coordination number and sphere
- IUPAC name of coordination compounds.

**LESSON -6 SOLID STATE****BOOK BACK QUESTIONS:**

- Define unit cell.
- Give any three characteristics of ionic crystals.
- Differentiate crystalline solids and amorphous solids.
- Distinguish tetrahedral and octahedral voids.
- What are point defects?
- Explain Schottky and Frenkel defect.
- Write short note on metal excess and metal deficiency defect with an example
- Calculate the number of atoms in a fcc, bcc and sc in unit cell.
- What is meant by the term "coordination number"?
- What is the coordination number of atoms in a bcc structure?
- Why ionic crystals are hard and brittle?

**BOOK INTERIOR:**

- Bragg's equation.
- Isotropy and anisotropy solids.
- Packing efficiency of FCC
- Stoichiometric defects in ionic solids.
- Define primitive & non-primitive unit cells?

**LESSON -7 CHEMICAL KINETICS****BOOK BACK QUESTIONS:**

- Define average rate and instantaneous rate.
- Define rate law and rate constant.
- Define the half-life of a reaction. Show that for a first-order reaction half-life is independent of initial concentration.
- Derive integrated rate law for a zero-order reaction  $A \rightarrow \text{product}$
- Differences between the order and molecularity.

- Write Arrhenius equation and explain the terms involved.
- Explain pseudo-first-order reaction with an example.
- Give examples for a zero-order reaction.
- Identify the order for the following reactions
  - Rusting of Iron
  - Radioactive disintegration of  ${}^{23}_{92}\text{U}$
  - $2A + B \rightarrow \text{products}$ ; rate =  $k[A]^{1/2}[B]^2$
- Factors affecting reaction rate.

**LESSON -8 IONIC EQUILIBRIUM****BOOK BACK QUESTIONS:**

- What are Lewis acids and bases? Give two examples for each.
- Identify the conjugate acid base pairs.
- Define solubility product.
- Define ionic product of water. Give its value at room temperature.
- Explain common ion effect with an example.
- Derive an expression for Ostwald's dilution law.
- Define pH.
- Write the expression for the solubility product of  $\text{Ca}_3(\text{PO}_4)_2$ ,  $\text{Hg}_2\text{Cl}_2$ .

**BOOK INTERIOR:**

- What are buffer solutions? Give an example.
- What is Buffer index?
- Explain the buffer action of a solution.
- Explain buffer action of acidic buffer.
- Derive Henderson-Hasselbalch equation
- Explain intermediate compound formation theory of catalysis with an example.
- What is the difference between homogeneous and heterogeneous catalysis?

**LESSON -9 ELECTRO CHEMISTRY****BOOK BACK QUESTIONS:**

- Define anode and cathode.
- Why does conductivity of a solution decrease on dilution of the solution?
- State Kohlrausch Law. How is it useful to determine the molar conductivity of weak electrolyte at infinite dilution.
- State Faraday's Laws of electrolysis.
- Is it possible to store copper sulphate in an iron vessel for a long time?
- Derive an expression for Nernst equation.
- Write a note on sacrificial protection.
- Explain the function of  $\text{H}_2 - \text{O}_2$  fuel cell.

**BOOK INTERIOR:**

- Define molar conductivity ( $\Lambda_m$ )
- Define equivalent conductance ( $\Lambda$ )

3. What are the applications of Kohlrausch's law?
4. Write a note on Debye-Huckel and Onsager equation.
5. Write a note on lithium – ion battery.
6. What are the factors affecting electrolytic conductance

### LESSON - 10 SURFACE CHEMISTRY

#### BOOK BACK QUESTIONS:

1. Differentiate physisorption and chemisorption.
2. What is the difference between sol and gel?
3. Give two important characteristics of physisorption.
4. Write a note on electro osmosis.
5. Write a note on catalytic poison.
6. Explain intermediate compound formation theory of catalysis with an example.
7. What is the difference between homogenous and heterogeneous catalysis?
8. Describe adsorption theory of catalysis.

#### BOOK INTERIOR:

1. What are promoters?
2. What is Tyndall effect?
3. What are emulsions? Write their types.
4. Write a note on Helmholtz double layer.
5. Explain various methods of purification of colloids.
6. Write a note on nano catalysis.

### LESSON - 11 HYDROXY COMPOUNDS AND ETHERS

1. Explain Kolbe's reaction.
2. What is metamerism?
3. What is Saytzeff's rule
4. Write a note on Swern Oxidation
5. What happens when ethylene glycol is heated with conc.  $\text{HNO}_3$  and conc.  $\text{H}_2\text{SO}_4$ ?
6. How is nitroglycerine prepared?
7. Convert aniline into phenol
8. Write a note on (i) Reimer Tiemann reaction (ii) Phthalin reaction (iii) coupling reaction
9. Write a note on Williamson ether synthesis?
10. How is picric acid prepared?
11. Give four uses of diethyl ether.
12. Explain Lucas test of differentiating three types of alcohols.

### LESSON - 12 CARBONYL COMPOUNDS AND CARBOXYLIC ACIDS

1. What is the action of HCN on (i) propanone (ii) 2, 4 – dichlorobenzaldehyde (iii) ethanol
2. How will you prepare (i) Cinnamic acid from benzaldehyde (ii) Benzoic acid from toluene
3. Write all possible structural isomers and position isomers for the ketone represented by the molecular formula  $\text{C}_5\text{H}_{10}\text{O}$
4. What happens when the following alkenes are subjected to reductive ozonolysis (i) Propene (ii) 1-butene
4. Write a note on Rosenmund reduction.
5. Illustrate Popoff's rule.
6. Write about Gattermann – Koch reaction.
7. What is Cannizzaro reaction?
8. Mention the uses of formaldehyde.
9. Write about Kolbe's electrolytic decarboxylation.
10. Mention the tests for carboxylic acids
11. What is Urotropine? How is it prepared? Mention its uses.
12. Explain the reducing nature of formic acid.
13. Explain the mechanism of aldol condensation.
14. Explain the mechanism of Cannizzaro reaction.
15. Convert benzaldehyde into (i) Schiff's base (ii) Malachite green dye
16. How can you identify aldehydes.

### LESSON - 13 ORGANIC NITROGEN COMPOUNDS

1. Write down the possible isomers of the  $\text{C}_4\text{H}_9\text{NO}_2$  and give their IUPAC names.
2. There are two isomers with the formula  $\text{CH}_3\text{NO}_2$ . How will you distinguish between them?
3. How will you convert nitrobenzene into (i) 1, 3, 5 – trinitrobenzene (ii) o and p – nitrophenol (iii) m – nitro aniline (iv) aniline
4. Write short notes on the following (i) Gabriel phthalimide synthesis (ii) Schotten – Baumann reaction (iii) Carbylamine reaction (iv) Mustard oil reaction (v) Coupling reaction (vi) Diazotisation (vii) Gomberg reaction (viii) Hofmann's bromamide reaction
5. How will you distinguish between Primary, Secondary, and tertiary aliphatic amines
6. Why Amines are more basic than amides?

7. Aniline does not undergo Friedel – Crafts reaction. Why?

## **LESSON - 14 BIOMOLECULES**

### **BOOK BACK QUESTIONS:**

1. Give the differences between primary and secondary structure of proteins
2. Give any three difference between DNA and RNA.
3. Write a short note on peptide bond.
4. Give two difference between Hormones and vitamins.
5. Write a note on the denaturation of proteins.
6. What is reducing and non – reducing sugars?
7. How are vitamins classified?
8. Define enzymes.
9. Write the structure of  $\alpha$  – D (+) glucopyranose.
10. What are different types of RNA which are found in cell?
11. What are the functions of lipids in living organisms?

### **BOOK INTERIOR:**

1. What are epimers?
2. What are Zwitter ions?
3. What is glycosidic linkage?

## **LESSON - 15 CHEMISTRY IN DAILY LIFE**

### **BOOK BACK QUESTIONS:**

1. How do antiseptics differ from disinfectants?
2. What are food preservatives?
3. Explain the mechanism of cleansing action of soaps and detergents.
4. What are narcotic and non – narcotic drugs. Give examples.
5. What are biodegradable polymers? Give examples.
6. How is terylene prepared?
7. Write a note on vulcanization of rubber.

### **BOOK INTERIOR:**

1. What are food additives? What are the advantages of food additives?
2. What are artificial sweetening agents? Give example.
3. How is nylon 6,6 prepared? Mention its use.
4. Write about Neoprene preparation? Mention its use.
5. Write about antioxidants.