## Higher Secondary – Second year

## Chemistry (Vol–1)

## Question Bank

## UNIT–1 METALLURGY

1. Differentiate between Mineral and Ore?
2. What are the steps involved in metallurgical process?
3. Write Gravity separation?
4. Describe froth floatation method?
5. What is chemical leaching?
6. Explain Magnetic separation?
7. What is roasting?
8. What is calcinations?
9. Write notes on flux, gangue and slag?
10. What is self–reduction?
11. Alumina thermic reduction method (or) Reduction using Metals?
12. Write electrolytic refining of silver?
13. Explain zone refining?
14. Describe a method for refining nickel (Or) Mond's process?
15. How titanium refining of Zr based on Van–Arkel method?
16. Outline the principle involving Vapour phase refining?
17. write the uses of Ellingham diagram?
18. write the limitation of Ellingham diagram?
19. Explain electrolytic refining of aluminium?

## UNIT–2 p–BLOCK ELEMENTS–1

1. What is inert pair effect?
2. Write short notes on anomalous properties of the first element of p–block.
3. Why p–block elements have metallic in nature?
4. Why halogens have –1 oxidation state.
5. First ionisation enthalpy of Al to Tl is gradually changed. Why?
6. How Borax beads are formed? (Or) Write action of heat of borax?
7. Write uses of Borax?
8. Write uses of Boron?
9. Write uses of Boric acid?
10. What is ethyl borate test? (Or) How will you identify the borate radical?
11. How boric acid is converted into Boron nitride?
12. Explain the structure of diborane?
13. Fischer–tropsch's synthesis?
12. How will you prepare Potash alum?
13. What is burnt alum?
14. List out the uses of Alum?
15. What is catenation? What is the condition involved in catenation?
16. Write the uses of silicones?
17. Explain the structure of Graphite?
18. Explain the structure of Diamond?
19. Describe the structure of fullerenes?

## UNIT–3 p–BLOCK ELEMENTS–2

1. Uses of helium?
2. Uses of neon?
3. Uses of Argon?
4. List out the uses of Chlorine?
5. What are interhalogen compounds? Give example.
6. Write the characteristics of interhalogen compound?
7. What is the hybridisation of Iodine in $IF_7$? Give its structure.
8. Write the hybridisation of $BrF_5$ and $BrF_3$?
9. How will you prepare Bleaching powder?
10. Write the bleaching action of Chlorine?

11.Give the balanced equation for the reaction between chlorine with Cold NaOH and hot NaOH?
12. How will you prepare chlorine with laboratory?
13. Why halogens have more reactive than other halogen?
14. Why Fluorine have –1 Oxidation state?
15. Write the bleaching action of $SO_2$?
16. Write structure of Caro's and Marshall Acid?
17. List out the uses of Ozone?
18. Write the structure of Phosphoric acid, Ortho phosphoric acid and Pyro phosphoric acid?
19. What is phosphorescence?.
20. Write the structure of ammonia?
21. Uses of Nitrogen?
22. Why Nitrogen have inert in nature?
23. Chalcogens are p–block elements. Why?
24. Find the oxidation state of halogen for following compounds?.
1) $OF_2$ 2) $O_2F_2$ 3) $Cl_2O_3$ 4) $I_2O_4$
25. Explain the structure and uses of ozone?
26. Write the bleaching action of $SO_2$?
27. Give the oxidation properties of $SO_2$?
28. $H_2SO_4$ is dehydrating agent– explain?
29. $H_2SO_4$ is dibasic acid – explain?
30. Give the one test for sulphuric acid?

## UNIT–4 TRANSISTION AND INNER TRANISITION ELEMENTS

1. What are transition metals? Give few examples?
2. Write the electronic configuration of Cr and Cu?
3. Write the electronic configuration of $Ce^{4+}$ and $Co^{2+}$?
4. Which is More stable ion $Mn^{4+}$ and $Mn^{2+}$;?
5 Transition metals show high melting points why?
6. $Fe^{2+}$ and $Fe^{3+}$ ions which is more stable?
7. Why first ionisation enthalpy of chromium is lower than that of Zinc?
8 Compare the first ionisation enthalpy of first transition series?
9. Describe the variable oxidation state of transition elements?
10. In 3d series which elements have +1 oxidation state?
11. Calculate the number of unpaired electron in $Ti^{3+,}$ $Mn^{2+}$ ions, and calculate spin only magnetic moment ?
12. What is Hume – Rothery rule?
13. Why transition elements form complexes?
14. Why transition elements act as a catalyst?
15. $Cr^{3+}$– strong reducing agent, $Mn^{3+}$ – strong oxidation agent. Explain?
16. Which is strong reducing agent $Cr^{2+}$ or $Fe^{2+}$ ?
17. Why copper have a positive $E_0$ value?
18. What are interstitial compound?
19. Write the characteristics of interstitial compounds?
20. $Cu^{2+}$ is coloured. but $Zn^{2+}$ is colourless why?
21. Preparation of $K_2Cr_2O_7$?
22. Write chromyl chloride test?
23. Preparation of $KMnO_4$?
24. What are inner–transition elements?
25.. Zr and Hf have similar properties why?
26.Eu(II) is more stable than Ce(II) why?
27. ; $Gd^{3+}$ –colourless why?
28. What is lanthanide contraction? and consequences of lanthanides contraction?
29. $Lu(OH)_3$ and $La(OH)_3$ which is more basic. why?
30. Differentiate between Lanthanides and actinides?

## UNIT–5 COORDINATION CHEMISTRY

1. Describe the Werner's theory of coordination complexes?
2. What are ligands?
3. What is coordination entity?
4. What is coordination polyhedron?
5. What is coordination number?
6. Differentiate double salts and coordination complexes?
7. Write the IUPAC names of following complexes
   1) $K_4[Fe(CN)_6]$ 2) $[Cu(NH_3)_4]SO_4$ 3) $[Fe(CO)_5]$
   4) $[Ag(CN)_2]^-$
8. Describe the assumption of VBT?
9. What is the limitation of VBT?
10. $[Cr(NH_3)_6]^{3+}$ Paramagnetic but $[Ni(CN)_4]^{2-}$ diamagnetic . Explain based on VBT?
11. Classify the following ligands based on number of donor atoms.
    a) NH3 b) en c) $OX^{2-}$ d) Pyridine
12. Explain structure and Magnetic properties of following complexes based on VBT.
    1)$[Ni(CO)_4]$ 2) $[Fe(CN)6]^{3-}$ 3) $[CoF6]^{3-}$
13. Explain linkage isomerism?
14. Coordination isomerism?
15. Explain crystal field theory?
16. Explain the crystal field splitting of Octahedral complexes?
17. Explain the crystal field splitting of tetrahedral complexes?
18. What is spectrochemical series?
19. Explain the bonding nature of metallic carbonyls?
20. Give one example of coordination complex which is used in medicine. and biological importance.
21. What is crystal field stabilising energy?
22. $[Ti(H_2O)_6]^{3+}$ coloured whereas $[Sc(H_2O)_6]^{3+}$ is colourless?

## UNIT–6 SOLID STATE

1. Describe characteristics of solids?
2. Differentiate crystalline and amorphous solids?
3. What is isotropy and anisotropy in nature?
4. List out the characteristics of ionic solids?
5. Write notes on covalent solids?
6. Explain molecular solids and its types?
7. Write notes on Metallic solids?
8. Define – Unit cell and Crystal lattice
9. Explain Primitive and non–primitive unit cells?
10. Calculate the number of atoms presents in SC, Bcc, fcc unit cells?
11. Write short notes on 1) Schottky defect 2) Frenkel defects?
12. Define Packing efficiency?
13. Calculate packing efficiency of sc, bcc, fcc unit cells?
14. Describe Metal excess defect and metal deficiency defects?
15. What is F–centres?
16. Why Zno become yellow on heating?

## UNIT–7 CHEMICAL KINETICS

1. Define– Rate of reaction?
2. Write notes on rate law and rate constant?
3. Define– Average and instant rate of reaction?
4. Differentiate rate and rate constant?
5. Define – Order of reaction?
6. Difference between Order and molecularity?
7. What are first order reaction? Give example?
8. Derive integrated rate equation for first order reaction?
9. What is Pseudo first order reaction?
10. What is zero order reaction and its example?
11. Derive the integrated rate equation for zero order reaction?

12. Define Half life time?
13. Half life time of the first order reaction is independent of initial concentration of reactant. Explain?
14. In first order reaction, show half life time of its reaction is ten times is equal to reaction is required for 99.9% completion?
15. Write Arrhenius equation?
16. Calculate half life time of first order reaction , the rate constant is $1.54 \times 10^{-3}\ s^{-1}$.
17. What is elementary reaction?
18. Discuss the graphical representation of first order reaction?
19. How rate of reaction is affected by reactants concentration?
20. How rate of reaction is affected by nature of reactants?
21. How rate of reaction is affected by catalysis?