# VIVEKANANDA VIDYALAYA MATRIC.HR.SEC.SCHOOL MADURANTAKAM

## XII CHEMISTRY UNIT WISE QUESTIONS

## 2 & 3 MARKS

## UNIT – 1 METALLURGY

1. Write the difference between minerals and ores.
2. Short note on gravity separation method
3. Froth floation with example.
4. Define acid leaching.
5. Explain calcinations process.
6. How is zirconium purified by van-arkel method?
7. Explain the following terms with suitable examples:
   a. Gange and slag
8. Define roasting method.
9. Define auto-reduction.
10. Give the basic requirement for vapor phase refining.
11. Give the limitation of Ellingham diagram.
12. Explain the principle of electrolytic refining with an example.
13. Uses of Al and zinc.
14. How the Nickel is purified by mond process?
15. Explain distillation method.
16. Explain the electrometallurgy of aluminum.
17. What is the role of limestone in the extraction of iron from its oxide $Fe_2O_3$?
18. What are the various steps involved in extraction of pure metals from their ores.
19. Mention the uses of copper.
20. Explain magnetic separation.
21. Explain cementation process.
22. Explain zone refining process with an example. (5m)

# UNIT – 2 P-BLOCK ELEMENTS – I

1. Write a short note on fisher tropsch synthesis – BB - 5
2. Give the uses of silicones –7
3. Write a short note on hydroboration. –BB – 9
4. Write a note metallic nature of p-block elements. BB-11
5. Give the uses of borax BB-3
6. CO is a reducing agent. Justify with an example BB-18
7. Inert pair effect 30
8. Use of boron -33
9. What happens when boric acid heated with ethyl alcohol?
10. Structure of boric acid & uses -35
11. Aluminum chloride prepared by McAfee process -39
12. How is potash alum prepared? Properties and uses? -40
13. Describe the structure of fullerenes – 42
14. Differentiate graphite and diamond -43,44
15. Uses of carbon di oxide – 45
16. Silicones preparation, types and uses – 46,47,48
17. Write a short note on zeolites BB -14
18. Give one example for each of the followings – BB-10
    i) icosogens ii) tetragen iii) prictogen iv) chalcogen
19. What is catenation? Describe briefly the catenation properity of carbon.
20. Complete the following reaction BB-12
    i) $B + NaOH \rightarrow 2Na_3BO_3 + 3H_2O$
    ii) $B(OH)_3 + NH_3 \rightarrow BN + 3H_2O$
21. A double salt which contains fourth period alkali metal (A) on heating at 500k gives (B). aqueous solution of (B) gives white precipitate with $Bacl_2$ and gives a red colour compound with alizatin. Identify A and B BB -17

# UNIT – 3 P-BLOCK ELEMENTS – II

1. Chalcogens belongs to p-block. Give reason BB-2
2. What are interhalogen compounds? Give examples BB-5
3. Give the uses of helium BB-7
4. Structure of ammonia -60
5. Differentiate white and red phosphorus -67
6. What happens when phosphorus reacts with oxygen and chlorine? Uses. BB-68
7. Structure of phosphine and uses -70
8. Structure of ozone -74
9. Uses of oxygen -75
10. $SO_2$ is strong reducing agent prove it -76
11. Explain the bleaching actions of $SO_2$
12. Uses of sulphuric acid -79
13. What happens when $Pcl_5$is headed? BB-19
14. What is the hybridization of iodine in $IF_7$? Give its structure.
15. How will you prepare chlorine in the laaboatory? BB-10
16. Decon's process -83 uses of chlorine -86
17. How is the bleaching powder prepared? -85
18. Give the balanced equation for the reaction between chlorine with cold NaOH and hot NaOH –BB-9
19. Complete the following reactions BB-23
    1. $Nacl + MnO_2 + H_2SO_4 \rightarrow$
    2. $P_4 + NaoH + H_2O \rightarrow$
    3. $Cu + H_2SO_4 \xrightarrow{Ho+conc}$
    4. $XeF_6 + H_2O \rightarrow$
    5. $Xe + F_2 \xrightarrow[400^oC]{Ni/200atm}$
20. Give the uses of argon BB-15
21. Give the oxidation state of halogens BB-15
    a) $OF_2$ b) $O_2F_2$ c) $Cl_2O_3$ d) $I_2O_4$
22. Why fluorine is the reactive than other halogens? BB-6

# UNIT – 4 TRANSITION AND INNER TRANSITION ELEMENTS

1. Justify the position of Lanthanides and actinides in the periodic table BB-4
2. What are actinides? Give three examples. BB-5
3. What is lanthanide contraction and what are the effects of canthanides BB-7
4. Calculate the number of unpaired electrons in $Ti^{3+}$, $Mn^{2+}$ and calculate the spin only magnetic movement BB-10
5. Write the electronic configuration of $Gd^{3+}$, $Lu^{3+}$
6. Explain chromyl chloride test -114
7. What is zeigler-natta catalyst? -111
8. Define Hume – Rothery rule. -111
9. What are interstitial compounds and properties? -111
10. Why d block elements exhibits various oxidation state.
11. Why $Mn^{2+}$ is more stable than $Mn^{3+}$ -108
12. Compare lanthanides and actinides -15
13. Out of $Lu(OH)_3$ and $La(OH)_3$ which is more basic and why? BB-19
14. Why do zirconium and hafnium exhibits similar properties? BB-21
15. Which is stronger reducing agent $Cr^{2+}$ or $Fe^{2+}$? BB-22
16. Which are inner transition elements? BB-3
17. Which is more stable? $Fe^{3+}$ or $Fe^{2+}$ explain?

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# UNIT – 5 COORDINATION CHEMISTRY

1. Define coordination number.
2. Define ligands.
3. Mension the types of coordination complex
4. Write the IUPAC name of the followings
   a) $[Ag(NH_3)_2]Cl$ b) $[Cu(NH_3)_4]SO_4$ c) $K_3[Fe(CN)_5NO]$
5. Give the difference between double salts and coordination compounds BB-13
6. What is linkage isomerism? Explain with an example BB-11
7. $[Ti(CH_2O)_6]^{3+}$ is coloured, white $[Sc(H_2O)_6]^{3+}$ is colourless explain BB-7
8. Explain optical isomerism in coordination compounded with an example. BB-16
9. Based on VB theory explain why $[Cr(NH_3)_6]$ is paramagnetic, while $[Ni(CN)_4]^{2-}$ is diamagnetic. BB-5
10. Write the IUPAC names for the following complexes. BB-1
    i) $[Ag(CN)_2]$ ii) $[Co(ox)_3]_2(SO_4)_3$
11. Write the formula for the following coordination compounds BB-2
12. What is crystal field splitting energy? BB-18
13. What is CFSE- BB-19
14. What are the limitations of VB theory? BB-24
15. Discuss briefly the nature of bonding in metal carbonyls. BB-21

**5 marks**

16. Explain VBT and main assumption of VBT
17. Postulates of Werner's theory. BB -14

# UNIT – 6 SOLID STATE

1. Give the characteristics of lonic crystals? BB-2
2. Define unit cell BB-1
3. Why ionic solid (crystals) are hard and brittle? BB-13
4. Explain schottky defect. BB-9
5. Write a short note on Frenkel defect BB-24
6. Differentiate crystalline and Amorphous solids. BB-3
7. Explain briefly seven types of unit cell. BB-5
8. Calculate the number of atoms in a fcc unit cell BB-11
9. Differentiate crystalline ad amorphous solids. BB-3
10. Classify the following solids BB-4

    a) $P_4$ b) brass c) diamond d) Nacl e) lodine
11. Distinguish tetrahedral and octahedral voids. BB-7
12. Write short note on metal excess and metal deficiency defect with an example BB-10
13. What is meant by the term ‘coordination number of atoms in a bcc structure BB-16
14. Aluminium crystallizes in a cubic closed packed structure. Its metallic radius is 125pm. Calculate the edge length of unit cell.BB-18
15. Barium has a body centred cubic unit cell which a length of 508pm along a edge. What is the density of barium in g $cm^{-3}$?
16. Define bragg’s equation.
17. Explain ZnO interstitial positions.

# UNIT – 7 CHEMICAL KINETICS

1. Define rate law and rate constant. BB-2
2. Define half life of a reaction. Show that for a first order reaction half life is independent of initial concentration. BB-4
3. A gas phase reaction has energy of activation 200KJ $mol^{-1}$. If the frequency factor of the reactions is $1.6 \times 10^{13}$ $S^{-1}$. Calculate the rafe constant at took. ($e^{-40.09} = 3.8 \times 10^{-18}$) BB-19
4. The rafe constant for a first order reaction is $1.54 \times 10^{-3} S^{-1}$. Calculate its half life time. BB-23.
5. A first order reaction is 40%. Complete in 50 minutes. Calculate value of the rafe constant. In what time will the reaction be 80% complete? **BB**-30
6. Explain briefly the collision theory of bimolecular reactions. BB-13
7. Explain the effect of catalyst on reaction rate with an example. BB-9
8. What is an elementary reaction? Give the differences between order and moleclarity of a reaction. BB-5
9. Derive integrated rate can for a zero order reaction A →product BB-3

## UNIT – 8 IONIC EQUILIBRIUM

1. Discuss the Lowry – bronsted concept of acids and bases. BB-2
2. Differentiate Lewis acids and bases. BB-5
3. Derive the relation between $P^H$ and $P^{OH}$.
4. Find out the $P^H$ values of the followings. BB-10
   a) Baking soda b) vinegar c) battery acid
5. Calculate the $P^H$ of 0.001M Hcl solution BB. 11
6. What is butter capacity.
7. Define butter solution. Mension their types. BB-16
8. Henderson – Hassebalch equation. BB-18
9. Find the $P^H$ of the butte solution containing 0.20 mole per litre sodium acetate and 0.18 mole per litre acetic acid. Ka for acetic acid is $1.8 \times 10^{-5}$
10. What are hydrolysis, menstion anionic and cationic hydrogen.-22,23
11. Define solubility product. BB-9
12. Define lonic product of water. Give its value of room rempature. BB-10
13. Explain common Ion effect withy an example. BB-11
14. Derive an expression for Oswald's dilution law BB-12
15. Define $P^H$ of $1.5 \times 19^{-3}$ m solution of $Ba(OH)_2$ BB-14
16. Calculate the $P^H$ of $1.5 \times 10^{-3}$m solution of $Ba(OH)_2$ BB-14
17. Ksp of $Ag_2CrO_4$ is $1.1 \times 10^{-12}$. What is solubility of $Ag_2CrO_4$ in 0.1M $K_2CrO_4$. BB-25
18. Write the expression for the solubility product of $Ca_3(PO_4)_2$.
19. Calculate $P^H$ of 0.04 M $HNO_3$ solution.
20. Derive an expression for the hydrolysis constant and degree of hydrolysis of salt of strong acid and weak base. BB-18.
21. A lab assistant prepared a solution by adding a calculated quantity of HCL gas at 25°C to get a solution with $[H_3O^+] = 4 \times 10^{-5}$M. is the solution neutral (or) acidic (or) basic.

## UNIT – 9 ELECTRO CHEMISTRY

1. State faraday's laws of electrolysis. BB-5
2. Is it possible to store copper sulphate in an Iron vessel for a long time? Given: $E^oCu^{2+}/Cu = 0.34V$ and $E^oFe^{2+}/F = -0.044V$. BB-15
3. Why is AC current used instead of DC in measuring the electrolytic conductance? BB-11
4. Write a short not on sacrificial protection. BB-25
5. Give the correct setup for mercury button cell. -57
6. Define emf cell potential with an example. -47
7. Give the Debye – Huckel and Onsagar equation for a strong electrode. -41.
8. Kohlraush's law. -41
9. How is conductivity of Lonic solutions measured by whetstone bridge circuit? (38)
10. Mention the factors affecting electrolytic condufomce. -37
11. Define specific resistance and conductance. -35
12. Derive an expression for Nernst equation. BB-24
13. Describe the construction of Daniel cell. Write the cell reaction.BB-6

## UNIT – 10 SURFACE CHEMISTRY

1. What is the difference between sol and gel? BB-8
2. Give 3 uses of emulsions. BB-15

3. Write a short note on catalytic Poison. BB-21
4. What do you meant by activity and selectivity of a catalyst?
5. Explain any one method for coagulation. BB-19
6. Describe adsorption theory of catalysis. BB-24
7. Why does bleeding stop by rubbing moist alum? BB-16
8. What are active centre? - 82
9. Explain Brownian motion. - 94
10. Write the types of emulsion with examples. - 97
11. Explain Helmholtz double layer. - 94
12. Explain intermediate compound formation theory with an example. BB-22

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