CHEMISTRY QUESTION BANK
XI STANDARD
INORGANIC CHEMISTRY

1. CHEMICAL CALCULATIONS

1. Define mole (3) and molar mass (3)
2. What is Avogadro number? (2)
3. Define oxidation and reduction in terms of electronic concept (14)(PH.E)
4. Define a. molarity (20) b. molality (21) (IR) c. normality (20) d. mole fraction (21).
5. State volumetric analysis (25) - (PH.E)
6. What are the methods can be used to determine equivalent mass? (26)
7. What is equivalent mass of acid? (28) (Q.E)
8. What is equivalent mass of base? (29)
9. What is equivalent mass of salt? (29) (H.E)
10. What is equivalent mass of oxidizing, reducing agent? (29)

II. Explain briefly on the following

11. How will you determine the equivalent mass of elements by hydrogen displacement method? (26)
12. How will you determine the equivalent mass of elements by oxide method? (27) (DM)
13. How will you determine the equivalent mass of elements by chloride method? (28) (Q.E)

PROBLEMS:

15. Calculate the oxidation number of underlined elements in the following species. (15)(Q.E)
   (a) CO₂ (b) Cr₂O₇²⁻ (c) Pb₃O₄ (d) PO₄³⁻ (e) MnSO₄ (f) S₂O₃²⁻ (g) HNO₃ (h) KMnO₄ (i) NH₄⁺
16. Calculate the equivalent mass of sulphuric acid(29)(DM)
17. Calculate the equivalent mass of KOH and KMnO₄ (2&30)
18. What is the mass in grams of chlorine atom. (3)(Q.E)
19. What is the mass in grams of HCl. (3)
20. What is the mass in grams of a Ca₅, ethanol, Na₂S, CH₃Cl, Na₂SO₃ (4)
21. Calculate the formula weights of the following compounds (2)
   (a) CHCl₃ (b) C₆H₁₂O₆ (c).CH₃OH (d) NO₂ (e) PCl₅ (f) K₂CO₃
22. Calculate the mass of oxygen obtained by completed by decomposition of 10 kg of pure potassium Chlorate (atomic mass K = 39, O = 16 , Cl =35.5)
23. What is the simplest formula of the compound which has the following percentage composition? carbon 80%, Hydrogen 20%?
24. A compound on analysis give the following percentage composition C = 54.54%, H = 9.09%, O = 36.36%, find its empirical formula.
25. An organic compound was found to have contained Carbon = 40.65%, Hydrogen = 8.55%, and Nitrogen = 23.7%. Its vapour density was found to be 29.5. What is the molecular formula of the compound?
27. An acid of molecular mass 104 contains 34.6% carbon, 3.85% hydrogen and rest oxygen. Calculate the molecular formula of the acid.
28. What is the simplest formula of the compound? which has the following percentage composition; carbon 80%, hydrogen 20%, if the molecular mass is 30, calculate its molecular formula.
29. Calculate the Molality of an aqu soln containing 3.0 g of urea (molar mass =6) in 20 g of water (IR)
30. Calculate the normality of solution containing 6.3 g of hydrated oxalic acid in 500 ml of solution.
2. GENERAL INTRODUCTION TO METALLURGY

1. Distinguish between ore and mineral with suitable example (37) (Q.E)(DM)****
2. What are the different method of concentration of ore? (40)
3. What is gravity separation? (40)
4. Explain a) roasting? (42) b)smelting (43) c) Gangue (37) d) Matte
5. What are the major steps involved in the metallurgical process? (42)
6. What is calcinations? Give example Mention the changes taking place in ore during Calculations (43) * (Q.E)(PH.E)
7. What is anode mud? (45)
8. How is copper metal is purified by electrolytic refining method? (45) (Q.E)
9. What are the elements obtained from sea water? *
10. What are the sources obtained from earth? (39)
11. What are the steps involved in metallurgical process? (39)
12. Mention the methods of concentration of phyrolusite and chinnabar ores? (38)&(40)(IR)

II. Explain briefly on the following
1. Explain froth floatation process with neat diagram. (Or) Expain the method of concentration of Zinc Blend ore (Or) How is concentrate sulphide ores explain(40) (Q.E)
2. How electromagnetic separation process is useful in the separation of magnetic impurities from non magnetic ores? Draw the diagram. (41) *
3. How the impurities of ore are removed by chemical method? (41)(H.E)
4. What is roasting? Explain the process with example. (42)
5. Explain about Bessimerisation process. (44)
7. How nickel is extracted by Monds process? (47)

3. ATOMIC STRUCTURE – I I

1. What is the charge of an electron, proton and neutron. (50).an atom of element has 6 electrons (a)how many electrons have clockwise spins . (b) how many s – orbitals are completely filled.(PH.E)
2. Write the orbital and shape for the following quantum numbers i) n=2,l=1 , ii) n=3, l=1(IR)
3. Using the S, P, d, f notion , describe the orbital with the following quantum numbers i) n=2,l=1 , ii) n=3, l=1 ii)n=2 ,l=0 (iv) n= 4, l= 3
4. Write the values of l and m fo P-orbitals.
5. Give the values for all quantum numbers for 2p electrons in Nitrogen
6. What is atomic number (52)
7. What is Zeeman effect? (54) and stark effect? (54)
8. What is the total number of orbital’s associated with the principal quantum number n = 2. (56)
   Write those orbitals. (IR) ....Practise n=2, n=4
10. Determine the number of electrons in 1st shell and mention the values of its quantum Number.(DM)
11. Give the electronic configuration of chromium and copper. (61) (DM)(Q.E)*****
   Using (n+l) rule of aufbau principle arrange the following in their increasing order of energies
   5s, 4p , 6p, 4f (PH.E)
12. Define aufbau principle and prove that 4s orbital has less energy than 3d orbital.(Q.E)
13. Using aufbau principle write the electronic configuration of the following atoms B , Ne, Al
14. What are the postulates of Bohr’s theory of atom? (S2) (PH.E)
15. Explain the various quantum numbers.( Principle quantum number) (54) (DM)(IR)(H.E)****
16. Discuss the shapes of s,p and d orbitals (57)
17. What are the limitations of Bohr’s theory of atom? (52)
4. PERIODIC CLASSIFICATION

1. State Newland law of octaves (67)
2. State Mendeleev’s periodic law (67)
3. State modern periodic law? (69) (IR)
4. Al^{3+} has smaller radius than Mg^{2+}, find the reason (IR)
5. What is atomic and ionic radii? (78) and Why Cl-ion is bigger than Cl atom? (81)
6. Cl + e^- ............... Cl^- + energy in the process. (a) identify the periodic property involved.
    Define the property (ionization energy). (PH.E) (81)
7. Compare ionization energy of Li and Be
8. Why boron has lower ionization energy than Beryllium? (88)
9. Why nitrogen has higher I.E value than oxygen
10. Out of fluorine and chlorine, which has greater electron gain enthalpy? (85) (PH.E)
11. The radius of cation is smaller than the parental atom give reason. (H.E)
12. Why noble gases have zero electron gain enthalpy? (85)
13. Electron affinity of Be and Mg is zero Why? (89)
14. Explain the factors which influence ionization enthalpy. (83) (PH.E)
15. What are the difference between electron gain enthalpy and electro negativity? (87)
16. Define electron affinity. (84). How does electron affinity change along a period and in a group. (84)

5. GROUP 1S BLOCK ELEMENTS

1. What are isotopes? Mention the isotopes of hydrogen. (96)
2. Mention the uses of deuterium. (99) (IR)
3. How is tritium prepared. Give the equations (99) (H.E)(DM)********
5. How does heavy water react with metals. (103)
6. How is hydrogen peroxide prepared in the laboratory (104)
7. Mention the uses of hydrogen peroxide. (106)
8. Mention the characteristics of alkali metals. (107)
9. Why alkali metals have low melting and boiling point (108)
10. Mention the uses of lithium (109)
11. What are the uses of sodium? (112) Give the reaction of Na react with ammonia (111)(PH.E)
12. Write about the exchange reaction of deuterium. (99)
13. Draw the structure of ortho and para hydrogen and explain (100)
14. Differentiate between ortho and para hydrogen (100) (PH.E)
15. Explain the preparation of heavy water (101)
16. Explain reducing property of hydrogen peroxide. (105) (H.E)
17. Explain how liquid hydrogen can be used as a fuel (106)
18. How is sodium extracted? Explain with a diagram (110)

6. GROUP 2S BLOCK ELEMENTS

1. What are the diagonal relationship between Be and Al? (119) (H.E)
2. What are the important ores of Magnesium? (119)
3. Write note on reducing properties of Magnesium. (121) (IR)
4. What is slaking of lime? And uses (122)
5. How is Gypsum prepared? Mention its uses. (122)
6. How is plaster of paris prepared? And give it uses. (123) (DM)
7. How is magnesium extracted from its ore? (119) (H.E)
8. How is Epsum prepared? Mention its uses. (121)
9. Explain the characteristics of S block elements (DM)
7. P- BLOCK ELEMENTS

1. Define Inter pair effect. (128) (H.E)
2. Mention the nature of hydrides in P block elements (130)
3. Why diamond is hard compared with graphite. (134)
4. Mention the uses of Nitrogen compounds (140)
5. What are acidic oxides? (143) ii) What are basic oxides? (144)
6. What are amphoteric oxides? (144)
7. Write note on peroxides (144)
8. Which is considered to “earth’s protective umbrella”? (147)
9. Mention the uses of ozone (146) (H.E)
10. What are CFC’S? Mention its environmental action. (148)
15. Draw the resonance structure of Ozone. (147)
16. How does ozone react with the following (a) PbS (b) BaO₂ (DM)
II. Explain elaborately on the following
17. How borax bead test is helpful in identifying basic radicals in qualitative analysis? (133) (IR)
   How will prepared Borax glass. (132) What are the uses of Borax (132)
18. Discuss the structural differences between diamond and graphite. (134)
19. How is ammonia manufactured by Haber’s process? (138)
20. Write a short note on fixation of nitrogen. (139)
21. How nitric acid is prepared by Ostwald process? (141) (H.E)
22. Explain the laboratory preparation of ozone. (145)

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