

The Besant Theosophical Higher Secondary School

VOLUME I 5 MARK

Date : 23-Nov-19

12th Standard

Chemistry

Reg.No. :

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Exam Time : 00:03:00 Hrs

Total Marks : 250

55 x 5 = 275

- 1) Describe the role of the following in the process mentioned.
 - (i) Silica in the extraction of copper.
 - (ii) Cryolite in the extraction of aluminium.
 - (iii) Iodine in the refining of Zirconium.
 - (iv) Sodium cyanide in froth floatation.
- 2) Explain the principle of electrolytic refining with an example.
- 3) Explain froth floatation, with diagram.
- 4) Explain refining of nickel by mond's process
- 5) Explain refming of titanium by Van-Arkel method.
- 6) List out the application of aluminum
- 7) How can you separate alumina from silica in a bauxite ore
- 8) What is zone refining? Describe the principle involved in the purification of the metal by this method.
- 9) Write a note on zeolites.
- 10) A hydride of 2nd period alkali metal (A) on reaction with compound of Boron (B) to give a reducing agent (C). identify A , B and C.
- 11) CO is a reducing agent . justify with an example.
- 12) What are the various methods by which carbon-di-oxide is prepared?
- 13) How are silicates classified? Give an example for each type of silicate.
- 14) Distinguish between diamond and graphite.
- 15) Give a reaction between nitric acid and a basic oxide.
- 16) Suggest a reason why HF is a weak acid, whereas binary acids of the all other halogens are strong acids.
- 17) Give a detailed account of the interhalogen, compounds with special reference to the: compounds involving iodine. Draw their structures.
- 18) Mention the uses of helium
- 19) Give a detailed account on allotropes of sulphur.
- 20) How is sulphuric acid manufacture by contact process?
- 21) Explain the Deacon's process
- 22) An element A occupies group number 15 and period number 3, reacts with chlorine to give compound B. The compound B on hydrolysis gives a dibasic acid C. The compound C on heating undergoes auto oxidation and reduction to give a tribasic acid D. Identify the elements A, compounds B, C and D. Write the reactions
- 23) Out of Lu(OH)₃ and La(OH)₃ which is more basic and why?
- 24) Which is stronger reducing agent Cr²⁺ or Fe²⁺?
- 25) Why first ionization enthalpy of chromium is lower than that of zinc?
- 26) Why is there a variation of atomic and ionic size as we move from Sc to Zn?
- 27) How are materials classified based on their magnetic properties?
- 28) What is crystal field splitting energy?
- 29) A solution of [Ni(H₂O)₆]²⁺ is green, whereas a solution of [Ni(CN)₄]²⁻ is colorless -Explain

- 30) What are the limitations of VB theory?
- 31) Write the oxidation state, coordination number, nature of ligand, magnetic property and electronic configuration in octahedral crystal field for the complex $K_4[Mn(CN)_6]$
- 32) Mention the type of hybridisation and magnetic property of the following complexes using VB theory a) $[FeF_6]^{4-}$ b) $[Fe(CN)_6]^{4-}$
- 33) Give the postulates and limitation of Werner's theory of co-ordination compounds.
- 34) What are the postulates of valence bond theory? Give its limitations.
- 35) For the complex $[NiCl_4]^{2-}$ write (i) the IUPAC name (ii) The hybridisation type (iii) The shape of the complex
- 36) What are the main assumptions of Valence Bond Theory? Explain.
- 37) What are the salient features of crystal field theory?
- 38) What is meant by the term "coordination number"? What is the coordination number of atoms in a bcc structure?
- 39) An element has bcc structure with a cell edge of 288 pm. the density of the element is 7.2 g cm^{-3} . how many atoms are present in 208g of the element.
- 40) Aluminium crystallizes in a cubic close packed structure. Its metallic radius is 125pm. calculate the edge length of unit cell.
- 41) An atom crystallizes in fcc crystal lattice and has a density of 103 g cm^{-3} with unit cell edge length of 100pm. calculate the number of atoms present in 1 g of crystal.
- 42) Write a note on Frenkel defect.
- 43) Ionic solids, which have anionic vacancies due to metal excess defect, develop colour. Explain with the help of a suitable example.
- 44) What are molecular solids? Explain the types of molecular solids.
- 45) An element with molar mass $2.7 \times 10^{-2} \text{ kg mol}^{-1}$ forms a cubic unit cell with edge length 405 pm. If its density is $2.7 \times 10^3 \text{ kg m}^{-3}$, What is the nature of the cubic unit cell?
- 46) What are stoichiometric defects in ionic solids? Explain
- 47) Write note on impurity defect?
- 48) The rate constant for a first order reaction is $1.54 \times 10^{-3} \text{ s}^{-1}$. Calculate its half life time.
- 49) A zero order reaction is 20% complete in 20 minutes. Calculate the value of the rate constant. In what time will the reaction be 80% complete?
- 50) A first order reaction is 40% complete in 50 minutes. Calculate the value of the rate constant. In what time will the reaction be 80% complete?
- 51) State the characteristics of order of reactions. (OR) Give the characteristics of order of reactions.
- 52) A first order reaction laws on rate constant $1.15 \times 10^{-3} \text{ S}^{-1}$. How long will 5 g of this reactant take to reduce to 3g?
- 53) Rate constant of a first order reaction is 0.45 sec^{-1} , calculate its half life.
- 54) Show that for a first order reaction the time required for 99.9% completion is about 10 times its half life period.
- 55) The half life period of first order reactions is 10 mins. What percentage of the reactant will remain after one hour?

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