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Name....................................

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FIFTH SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2015

(UG–CCSS)

Chemistry

CH5 B09—INORGANIC CHEMISTRY—I

Time : Three Hours

Maximum Weightage : 30

I. **Answer** *all* the twelve questions. Each question carries a weightage of $\frac{1}{4}$. This section contains Multiple choice, Fill in the blanks and one word answer questions :

1 Which among the following has lowest melting point ?

    (a) Li.   **(b) Cs.**

    (c) Mg. ————————   (d) Ba.

2 In the extraction of which of the following metals, water gas is used ?

    (a) Ti.   **(b) U.**

    (c) Ni. ———————   **(d) Li.**

3 A colourless species among the following is :

    (a) Ag^+.   (b) Mn^+

    (c) Cu^+. ———————   (d) Fe^+.

4 Phenolphthalein cannot be used as indicator, in the titration of :

    (a) Oxalic acid and NaOH.   (b) Na_2CO_3 and HCl.

    (c) NaOH and HCl. ——————— (d) KOH and H_2SO_4.

5 The shape of ClF_3 molecule is ————

6 The number of lone pairs of electrons present in the outermost shell of Xe in XeF_2 is ————

7 When diborane is heated with excess NH_3 at high temperature ———— is formed.

8 Bronze is an alloy of copper and ————

9 The general outer electronic configuration of 'd' block elements is ————

10 A solution of known concentration is called ————

11 Titrations using standard solution of iodine are called ———— titrations.

12 Give the name of an anion that can be eliminated by boiling with concentrated HCl.

($12 \times \frac{1}{4} = 3$ weightage)

Turn over

II. Answer *all* the *nine* questions. Each question carries a weightage of 1 :

    13 Define lattice energy of an ionic compound.

    14 State the Faj an's rules of polarisation of ions.

    15 What are interhalogen compounds ?

    16 $Pb(II)$ compounds are stabler than $Pb(IV)$ compounds. Why ?

    17 What happens to the ore during calcination ?

    18 Name any two ores of Titanium.

    19 Mention the features that enhance the complexing capacity of 'd' block elements.

    20 Arrange Fe^+, Fe^+, Cu+ and Cu^+ ions in the order of their magnetic moments.

    21 Give the names of two internal indicators used in redox titrations.

(9 x 1 = 9 weightage)

III. Answer any *five* questions. Each question carries a weightage of 2 :

    22 Explain the geometry of NH_3 and H_2O molecules.

    23 What are polar covalent bonds ? How is the degree of polarity of a covalent bond determined ?

    24 What is borazine ? How is it prepared ?

    25 How is U_3O_8 isolated from pitch blende ?

    26 What is lanthanide contraction ? Mention any *two* consequences of lanthanide contraction.

    27 Compare the oxidation states of lanthanides and actinides.

    28 Explain the theory of complexometric titrations.

(5 x 2 = 10 weightage)

IV. Answer any *two* questions. Each question carries a weightage of 4 :

    29 (i) Account for the irregular variation in the ionisation energies of group 13 elements.

      (ii) Explain the structure of Boric acid.

    30 Write short notes on : (i) Hydrometallurgy ; (ii) Van Arkel method ; (iii) Open hearth process.

    31 Explain coprecipitation and post precipitation. How do these affect the accuracy of gravimetric analysis ?

(2 x 4 = 8 weightage)