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Name.....01.....

Reg. No.....

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 :

- Which among the following has lowest melting point ?
(a) Li. (b) Cs.
(c) Mg. (d) Ba.
- In the extraction of which of the following metals, water gas is used ?
(a) Ti. (b) U.
(c) Ni. (d) Li.
- A colourless species among the following is :
(a) Ag^+ . (b) Mn^{2+} .
(c) Cu^{2+} . (d) Fe^{3+} .
- 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 .
- The shape of ClF_3 molecule is _____.
- The number of lone pairs of electrons present in the outermost shell of Xe in XeF_2 is _____.
- When diborane is heated with excess NH_3 at high temperature _____ is formed.
- Bronze is an alloy of copper and _____.
- The general outer electronic configuration of 'd' block elements is _____.
- A solution of known concentration is called _____.
- Titration using standard solution of iodine are called _____ titrations.
- Give the name of an anion that can be eliminated by boiling with concentrated HCl.

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

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

- 13 Define lattice energy of an ionic compound.
- 14 State the Fajan'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^{2+} , Fe^{3+} , Cu^+ and Cu^{2+} ions in the order of their magnetic moments.
- 21 Give the names of two internal indicators used in redox titrations.

(9 × 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 × 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 × 4 = 8 weightage)