

B.Sc. (CBCS Pattern) Semester-III  
**USCCHT05 - Chemistry Paper-I : Inorganic Chemistry**

P. Pages : 2

Time : Three Hours



**GUG/W/24/11600**

Max. Marks : 50

Notes : 1. All the **five** questions are compulsory.

1. a) What is diborane? Describe the structure and Bonding of diborane ( $B_2H_6$ ) 5
- b) What is Interhalogen Compound? Explain the structure and Bonding of following. 5
- i)  $ClF$  ii)  $IF_5$

**OR**

- c) Explain the structure of sulphur tetranitride ( $S_4N_4$ ). 2½
- d) Explain structure and Bonding in Caro's acid. 2½
- e) Give applications of Carbides. 2½
- f) What is Polyhalides? Draw the structure of  $I_3$ . 2½
2. a) What is the Lattice energy? Describe the Born-Habber cycle in brief. 5
- b) Write a note on. 5
- i) Free electron theory in metallic bonding.
- ii) Define conductor, semiconductor and insulator on the basis of bond theory.

**OR**

- c) What do you mean by Radius Ratio rule? 2½
- d) Explain Fajan's Rule with example. 2½
- e) Explain Lewis concept of Acid and Bases. 2½
- f) Explain solvation energy examples. 2½
3. a) Write a brief note on. 5
- i) Electronic configuration of first transition series.
- ii) Variable oxidation state of first transition series.

- b) Discuss the comparative study – 5  
 i) Cr, Mo, with W with respect to magnetic property and stereochemistry.  
 ii) Co, Rh and Ir with respect to magnetic property and stereochemistry.

**OR**

- c) Explain Magnetic properties of  $[\text{Cu}(\text{H}_2\text{O})_6]^{2+}$ . 2½  
 d) Write electronic configuration of first transition series. 2½  
 e) Write a note on catalytic properties of first transition series. 2½  
 f) Explain complex formation tendency of first transition elements. 2½

4. a) Explain various method for lanthanoids isolation and separation. 5  
 b) Discuss oxidation state & Electronic configuration of Actinides. 5

**OR**

- c) What is Lanthanoid contraction. 2½  
 d) Explain position of Actinoids in the periodic table. 2½  
 e) Write electronic configuration of lanthanoids series. 2½  
 f) Explain the atomic & ionic radius of actinides. 2½

5. Attempt **any ten** questions. (each carry one marks) 1x10  
 i) Draw the structure of  $\text{ClF}_3$ .  
 ii) Draw the structure of Marshall acid.  
 iii) Why Borazine called as In organic Benzene.  
 iv) Define co-ordination number.  
 v) Give the properties of metal.  
 vi) Define space lattice.  
 vii) Why Zn and Hf are called twins element?  
 viii) What is Ionization potential.  
 ix) Explain position of block in periodic table.  
 x) Define oxidation state.  
 xi) Name any two important ores of Lanthanoids.  
 xii) Write electronic configuration of Lanthanum.

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