

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

P. Pages : 2

Time : Three Hours



**GUG/W/23/11600 (S)**

Max. Marks : 50

- Notes : 1. All **five** questions are compulsory and carry equal marks.  
2. Write chemical equation and draw diagram whenever necessary.

1. a) What is diborane? Describe the structure and Bonding in diborane ( $B_2H_6$ ). 5
- b) What is Interhalogen compound? Explain the structure and Bonding of following. 5
- i)  $ICl^-$
- ii)  $ClF_3$

**OR**

- c) Why Borazine is called as inorganic benzene. 2½
- d) Give classification of carbides. 2½
- e) Describe the preparation and structure of Borazine. 2½
- f) Explain the structure of Sulphur tetranitride ( $S_4N_4$ ). 2½
2. a) What is the Lattice energy? Describe the Born-Haber cycle in brief. 5
- b) Define solvation energy? Explain the solubility of ionic solids. 5

**OR**

- c) Discuss band theory for conductors. 2½
- d) Explain the term polar covalent bond, write factors affecting polarizing power of cations. 2½
- e) Define acids and bases in terms of Lux-Flood concept. Give one example of each. 2½
- f) What is radius ratio rule? Give its two applications. 2½
3. a) Write brief note on: 5
- i) Catalytic activity of first transition series.
- ii) Variable oxidation state of first transition series.
- b) Discuss the comparative study. 5
- i) Cr, Mo and W ----- with respect to Stereochemistry.
- ii) Ni, Pd and Pt ----- with respect to magnetic behavior.

**OR**

- c) Write electronic configuration of 5d, transition series. 2½
- d) Discuss the electronic configuration of second transition element. 2½
- e) Explain first transition series elements with respect to complex formation tendency. 2½
- f) Discuss the complex formation tendency of first transition series elements. 2½
- 4. a) What is lanthanide contraction? Give reasons of lanthanide contraction. 5  
How it affects properties of post lanthanide element.
- b) Explain actinide series elements with respect to 5  
i) Electronic configuration ii) Oxidation state

**OR**

- c) Describe ion exchange method for separation of lanthanide. 2½
- d) Write note on position of actinide in periodic table. 2½
- e) Discuss lanthanides with respect to their complex formation tendency. 2½
- f) Write electronic configuration of lanthanides. 2½
- 5. Attempt **any ten** questions (each carry one marks) 1x10
  - i) Write any four industrial applications of carbides.
  - ii) Draw structure of  $\text{IF}_5$ .
  - iii) Write structure of Borazine.
  - iv) Define co-ordination number.
  - v) Define solvation energy.
  - vi) Draw the band structure of semiconductors.
  - vii) Write electronic configuration of Cr and Cu?
  - viii) Calculate the Magnetic moment of  $\text{Mn}^{2+}$  ion.
  - ix) Why Zn and Hf are called twins elements.
  - x) Name any two important minerals of lanthanides.
  - xi) Why  $\text{Ti}^{3+}$  colored and paramagnetic?
  - xii) What do mean by trans uranic elements.

\*\*\*\*\*