

B.Sc. (C.B.C.S. Pattern) Sem-III
USCCHT05 - Chemistry-I Inorganic Chemistry

P. Pages : 2

Time : Three Hours



GUG/W/19/11600

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 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) What is carbides? Describe classification of carbides. **2½**
d) Why borazine is called as inorganic benzene. **2½**
e) Describe the preparation and structure of Caro's acid. **2½**
f) Explain the Cradle shaped structure of Sulphur tetranitride (S_4N_4). **2½**
2. a) What is the Lattice energy? Describe the Born-Haber cycle used for finding the lattice energy of NaCl solid. **5**
b) What is Band theory? Explain the term of conductor, semiconductor and insulator on the basis of Band theory. **5**

OR

- c) Explain giving example of Lux-flood concept of acid and bases. **2½**
d) What is polarization of ion? Discuss Fajan's rule with example. **2½**
e) Explain free electron theory for metal. **2½**
f) Discuss limitations of Radius ratio rule. **2½**
3. a) Discuss the first transition series with respect to their atomic and ionic radius and Ionization potential. **5**
b) Discuss the comparative study: **5**
i) Cr, Mo and W ----- with respect to stereochemistry.
ii) Ni, Pd and Pt ----- with respect to oxidation state.

OR

- c) Discuss the catalytic activity of first transition series and their compound. 2½
- d) Discuss the variable oxidation state with respect to first transition element. 2½
- e) Discuss the electronic configuration of second transition element. 2½
- f) Compare magnetic properties of first transition series elements. 2½
4. a) What is the lanthanide contraction? What are the causes and consequences of lanthanide contraction. 5
- b) Discuss the actinide with respect to. 5
- i) Atomic and Ionic Radius.
- ii) Oxidation state.

OR

- c) Explain Ion-exchange method for separation of lanthanides. 2½
- d) Discuss the position of Actinides in periodic table. 2½
- e) What is Lanthanide? Discuss the electronic configuration of lanthanides. 2½
- f) Discuss the complex formation tendency of lanthanides. 2½
5. Attempt **any ten**. 10
- i) Write molecular formula of Marshall Acid.
- ii) Draw the structure of ICl_4^\ominus .
- iii) Give IUPAC nomenclature of B_5H_9 and B_4H_{10} .
- iv) What is "Solvation energy".
- v) What is Metallic bond?
- vi) How many number of atom per unit cell in BCC.
- vii) Which of the given ion is coloured.
 Fe^{2+} , 2n^{2+} and co^{2+} .
- viii) Calculate magnetic moment of cu^{2+} ion.
- ix) Write electronic configuration of Ru.
- x) Give the position of Actinoids in the periodic table.
- xi) What is Nernst distribution law.
- xii) Name any two important minerals of lanthanides.
