

B.Sc. (With Credits)-Regular-Semester 2012 Sem III
B.Sc. 2351 - Chemistry-I (Inorganic Chemistry) Paper-I

P. Pages : 2

Time : Three Hours



GUG/W/16/3332

Max. Marks : 50

- Notes : 1. All the **five** questions are compulsory and carry equal marks.
2. Write chemical equations and draw diagrams wherever necessary.

1. a) What is polarisation of ions? Discuss Fajan's rule and its consequences with suitable example. **5**

b) Discuss : 1) Free electron theory. 2) Valence bond theory. **5**

OR

c) Explain any two consequences of hydrogen bonding. **2½**

d) Explain the terms conductor and insulator on the basis of band theory. **2½**

e) Define Hydrogen Bonding. Describe the type of hydrogen bonding with suitable example. **2½**

f) Calculate the lattice energy of sodium fluoride from the following data. **2½**

- 1) Heat of sublimation = 100.42 kJ/mole.
- 2) Ionisation energy of sodium = 493.72 kJ/mole.
- 3) Dissociation energy of fluorine = 153.14 kJ/mole.
- 4) Electron affinity of fluorine = - 332.63 kJ/mole.
- 5) Heat of formation of sodium fluoride = - 569 kJ/mole.

2. a) Discuss the first transition series with respect to **5**
1) Complex formation tendency. 2) Oxidation state.

b) Discuss oxidation state and stereochemistry of Co, Rh and Ir. **5**

OR

c) Discuss the electronic configuration of first transition series element. **2½**

d) What is paramagnetism? Why is Ti^{3+} is paramagnetic. **2½**

e) Explain magnetic properties of Cr, Mo and W. **2½**

f) Transition element and their compounds are used as catalyst. Explain. **2½**

3. a) What is error? Discuss classification of errors giving examples. **5**

b) Explain. **5**

- 1) Theory of complexometric titration.
- 2) Quinonied theory of indicators.

OR

- c) Following data was obtained for concentration of iron in a water sample 11.2, 11.6, 11.0 and 11.1 ppm. Predict whether the result 11.6 be rejected using 2.5d rule and 4d rule. **2½**
- d) Explain the terms. 1) Accuracy. 2) Precision. **2½**
- e) Discuss the general principles involved in redox titration. **2½**
- f) On the basis of Ostwald's theory explain working of phenolphthalein in acid-base titration. **2½**
4. a) Discuss the precipitation and solvolysis reaction in liq. NH_3 and liq. SO_2 as solvent with suitable example. **5**
- b) What is portland cement? Name the raw material required for the manufacture of portland cement. Discuss the role of water and gypsum during setting of cement. **5**

OR

- c) Distinguish between ionising and non-ionising solvent. **2½**
- d) Discuss the advantages of compost over chemical fertilizer. **2½**
- e) What is organic manure? Discuss the advantages of organic manure over chemical fertilizers. **2½**
- f) Discuss the reaction taking place in maximum temperature zone during the process of cement manufacturing. **2½**
5. Attempt **any ten**. **10**
- i) Define solvation and solvation energy.
- ii) Define Metallic bond.
- iii) Glycerol is more viscous, than glycol why.
- iv) Why Cu^{2+} ion is paramagnetic in nature.
- v) Write the stable electronic configuration of Pd ($z = 46$) and La ($z = 57$).
- vi) Explain why Cr and Cu have abnormally high second I.P.
- vii) Define : a) Mean b) Median.
- viii) Calculate significant figure. (1) 3.00224 (2) 6.23×10^{23}
- ix) Define solvolysis reaction.
- x) Explain the term slurry.
- xi) What is EDTA? Draw its structure.
- xii) Define compost.
