



SB-3486
M. Sc. (Sem. II) (Part-I) (Self-Finance)
Examination
March / April – 2011
Inorganic Chemistry : Paper-I

Time : 3 Hours]

[Total Marks : 70

Instructions :

(1)

<p>नीचे दृष्टावेक निशानीवाणी विगतो उत्तरवडी पर अवश्य लपवी. Fillup strictly the details of signs on your answer book.</p> <p>Name of the Examination : M. SC. (SEM. II) (PART-I) (SELF-FINANCE)</p> <p>Name of the Subject : INORGANIC CHEMISTRY : PAPER-I</p> <p>Subject Code No. : 3 4 8 6 Section No. (1, 2,.....): Nil</p>	<p>Seat No. : □ □ □ □ □ □</p> <p style="text-align: center; border: 1px solid black; border-radius: 15px; padding: 10px;">Student's Signature</p>
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1 Write any three from the following : **6x3=18**

- (a) What is isomerism ? List the different types of isomerism present in coordination compounds. Explain the linkage and coordination isomerism in detail with suitable examples.
- (b) What is valence bond theory ? Give the important features of valence bond theory. Explain the structure of $[\text{Cu}(\text{NH}_3)_4]^{2+}$ and $[\text{CuCl}_4]^{3-}$ ions by valence bond approach.
- (c) What is crystal field stabilization energy ? Give the basic assumptions of crystal field theory. Explain the splitting patterns in four coordinated compounds with appropriate examples.
- (d) What do you mean by stability of metal complex. Name the factors which affect the stability of complexes. How chelate effect affect the metal ligand stability in metal complexes.

- (e) What is metal π complexes ? Which type of ligands are used as π -acid ligands. Classify the carbonyl complexes of transition metals. Explain the structure of $\text{Co}_2(\text{CO})_8$ by valence bond approach.

2 Write any three : **6x3=18**

- (a) Give the discovery and scope of the crown ethers. Give the different structure of (18) crown-6 and K^+ .
- (b) What is cryptands ? Give the methods of synthesis of cryptands.
- (c) What is supra molecular chemistry ? Explain Host-Guest chemistry. Give the classification of supra molecular host-guest compounds.
- (d) What is the nature of supra molecular interactions ? Give the different types of interaction present in supra molecules. Discuss in detail any one type of interaction present in supra molecule.
- (e) Give the different methods of synthesis of crown ethers.

3 Write any three answers from the following : **6x3=18**

- (a) What is inorganic polymer ? Why the inorganic polymers are less observed than organic polymers ? Give the general properties of inorganic polymers.
- (b) Give the synthesis properties and application of polyphosphazenes and polysiloxanes inorganic polymers.
- (c) Shows how colligative properties can be used of determine the molecular weight of inorganic polymer.
- (d) How will you determine the degree of crystallinity ?
- (e) Give the preparation of silicon fluids. Discuss the properties and application of silicon fluids.

4 Answer any four from the following : **4x4=16**

- (a) Describe metal π bonding in phosphine complexes. How it differs from carbonyl bonding ?

- (b) Write notes on :
- (i) Heterocrowns and
 - (ii) Heterocryptands.
- (c) How will you differentiate the valence bond and crystal field theory ? Give their drawbacks.
- (d) Discuss the structure and bonding in $\text{Os}_3(\text{CO})_{12}$.
- (e) What are coordination polymers ? Give the preparation and properties of coordination polymers with suitable examples.
- (f) Outline various characteristics of inorganic polymers.
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