



## Bachelor of Science (B.Sc.) Semester—IV

## Examination

## CH-401 : CHEMISTRY

## (Inorganic Chemistry)

## Paper—I

Time—Three Hours]

[Maximum Marks—50]

**N.B. :—** (1) All **FIVE** questions are compulsory and carry equal marks.

(2) Write equation and draw diagram wherever necessary.

1. (A) Using valance bond theory explain structure and magnetic properties of :

(i)  $[\text{Fe}(\text{CN})_6]^{4-}$  and (ii)  $[\text{CoF}_6]^{3-}$ . 5

(B) What are chelates ? Give one example of chelate formed by bidentated and hexa-dentated ligand. Explain the Industrial applications of chelates. 5

OR

(C) Differentiate between double salt and Co-ordination compound. 2½

(D) Write IUPAC Name of following :—

(i)  $[\text{Fe}(\text{H}_2\text{O})_6]^{2+}$  and (ii)  $\text{Ag}[\text{Ag}(\text{CN})_2]$ . 2½

(E) What is EAN ? Calculate EAN in  $[\text{Cu}(\text{H}_2\text{O})_4]^{+1}$  2½  
 $z = 29$ .

(F) Give the postulates of Werner's theory. 2½

2. (A) Explain geometrical isomerism in 6-Co-ordinated complexes. 5

(B) What are Latimer diagrams ? Discuss Latimer diagram for chlorite in acidic solution. 5

**OR**

(C) Explain :

Ligand and Linkage isomerism with one example each. 2½

(D) Discuss the stability field of water. 2½

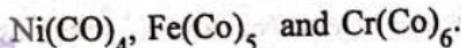
(E) Explain optical isomerism in 4-coordinated complexes. 2½

(F) Discuss Frost diagram for oxygen. 2½

3. (A) What are organometallic compounds ? How are they classified on the basis of metal-carbon bond ? 5



(B) Give one method of preparation of



Discuss the structure and bonding in  $\text{Fe}(\text{Co})_5$ . 5

OR

(C) Give one method of Preparation of Alkyl and Aryl lithium. 2½

(D) Discuss the structure and bonding in  $\text{Ni}(\text{Co})_4$ . 2½

(E) Explain structure and bonding in metal ethylenic complex. 2½

(F) Give the name of following organometallic compounds :

(i)  $(\text{C}_6\text{H}_5)_2\text{Hg}$  and (ii)  $(\text{CH}_3)_3\text{SnBr}$ . 2½

4. (A) What are the functions of Haemoglobin ? Discuss the structure of hemoglobin. 5

(B) What is Hard acid ? Explain :

(i)  $\text{AgI}_2^-$  is stable complex while  $\text{AgF}_2^-$  does not exist

(ii) Calcium occurs as a Calcium Carbonate not as Carbonate Sulphide. 5

OR



2½

(C) Explain symbiosis with example. 2½

(D) What is the role of  $\text{Na}^+$  and  $\text{K}^+$  ions in biological system. 2½

(E) Explain the bio-chemical role of calcium. 2½

(F) Discuss the structure of myoglobin. 2½

5. Attempt any **TEN** of the following :—

- What is ligand ?
- Define the term complex ion
- Using Werner's theory predict the number of  $\text{Cl}^-$  ions precipitated by  $\text{AgNO}_3$  in  $\text{CoCl}_3 \cdot 5\text{NH}_3$ .
- Define ionisation isomerism.
- What is Frost diagram ?
- What is disproportionation ?
- What are metal carbonyls ?
- What is the action of heat on Triethyl aluminium ?
- What is meant by homogeneous hydrogenation of alkenes ?
- Give the name of two essential non metals in biological systems.
- Define soft acids.
- Classify the following as hard and soft bases :

(i)  $\text{PO}_4^{3-}$  and (ii)  $\text{SCN}^-$ .

1×10