



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 valence 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) $\text{Ag}[\text{Ag}(\text{CN})_2]$. $2\frac{1}{2}$

(E) What is EAN ? Calculate EAN in $[\text{Cu}(\text{H}_2\text{O})_4]^{+1}$
 $z = 29$. $2\frac{1}{2}$

(F) Give the postulates of Werner's theory. $2\frac{1}{2}$

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. $2\frac{1}{2}$

(D) Discuss the stability field of water. $2\frac{1}{2}$

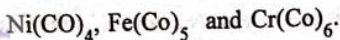
(E) Explain optical isomerism in 4-coordinated complexes. $2\frac{1}{2}$

(F) Discuss Frost diagram for oxygen. $2\frac{1}{2}$

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 Fe(CO)_5 . 5

OR

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

(D) Discuss the structure and bonding in Ni(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) AgI_2^- is stable complex while AgF_2^- does not exist

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

OR

(C) Explain symbiosis with example. 2½

(D) What is the role of Na^+ and 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 :—

(i) What is ligand ?

(ii) Define the term complex ion

(iii) Using Werner's theory predict the number of Cl^- ions precipitated by AgNO_3 in $\text{CoCl}_3 \cdot 5\text{NH}_3$.

(iv) Define ionisation isomerism.

(v) What is Frost diagram ?

(vi) What is disproportionation ?

(vii) What are metal carbonyls ?

(viii) What is the action of heat on Triethyl aluminium ?

(ix) What is meant by homogeneous hydrogenation of alkenes ?

(x) Give the name of two essential non metals in biological systems.

(xi) Define soft acids.

(xii) Classify the following as hard and soft bases :

(i) PO_4^{3-} and (ii) SCN^- .

1×10