

CHEMISTRY PAPER-IX

(Inorganic Chemistry-A)

Time Allowed : 3 Hours

Max. Marks : 22

Note : (i) Attempt five questions in all. One question from each Unit and the compulsory question.

(ii) Compulsory question carries 6 marks and remaining all questions carry 4 marks each.

UNIT-I

- (a) Draw and explain the structure of copper (II) acetate monohydrate. Account for its low magnetic moment. 2
- (b) Cu^{2+} ions are coloured and paramagnetic while 2n^{2+} ions are colourless and diamagnetic. Explain 2
- (a) Why do transition metals (i) Exhibit good catalytic properties (ii) Have great tendency to form complexes ? 2
- (b) 4s subshell is filled prior to 3d but on ionisation 4s electrons are removed first. Explain. 2

UNIT-II

- (a) Complexes of First Transition Series are mainly high spin while there of 2nd and 3rd transition series are of low spin. Explain. 2
- (b) Out of Au(I) and Au(III), which state disproportionates and how ? 1
- (c) Draw the structure of $\text{Nb}_2\text{Cl}_{10}$. 1
- (a) Compare the 1st transition series with 2nd and 3rd transition series in terms of :
 - Metallic Bonding
 - Oxidation States 3
- (b) What are Platinum Metals ? Why are these called noble metals ? 1

UNIT-III

5. (a) Draw all possible isomers of $[\text{Co}(\text{en})_2\text{Cl}_2]^+$. 2
(b) Write IUPAC names of the following : 2
(i) $[\text{Pt}(\text{NH}_3)_4][\text{PtCl}_4]$ (ii) $\text{Hg}[\text{Co}(\text{CNS})_4]$
6. (a) Calculate the EAN of the central metal in the following complexes and tell which of them Obey's EAN rule (i) $[\text{Ni}(\text{CN})_4]^{2-}$ (ii) $[\text{Mo}(\text{CN})_6]$. 2
(b) What is ionisation isomerism ? Explain giving an example. 2

UNIT-IV

7. (a) Account for the different magnetic behaviour of hexacyanoferrate (III) and hexa fluoroferrate (III) ions. 3
(b) Name the Hybridisation in $[\text{Ni}(\text{CN})_4]^{2-}$ ion. 1
8. (a) What is the difference between inner and outer d orbital complexes? Explain by taking example. 3
(b) How many unpaired electrons are present in $[\text{Fe}(\text{H}_2\text{O})_6]^{2+}$? 1

UNIT-V

(Compulsory Question)

9. (a) Calculate the spin only magnetic moment for Ti^{2+} .
(b) Name two elements belonging to group of copper.
(c) How many Cl^- ions will be precipitated by AgNO_3 in $\text{CoCl}_3 \cdot 3\text{NH}_3$ complex ?
(d) Name the metal ion present in chlorophyll.
(e) Give an example of $\text{Fe}(\text{O})$ compound.
(f) Name the 1st and the last element of 2nd transition series. $1 \times 6 = 6$