Total number of printed pages–4

63(FY) SEM–4/MAJ/CHMMAJ2034

2025

CHEMISTRY

(Major)

Paper : CHMMAJ2034

(Inorganic Chemistry–II)

Full Marks : 50

Pass Marks : 20

Time : Two hours

The figures in the margin indicate full marks for the questions.

1. Choose the correct answer from the following : 1×5=5

   (a) Pyridine is an example of

   (i) Unidentate ligand

   (ii) Bidentate ligand

   (iii) Tridentate ligand

   (iv) Tetradentate ligand

(b) The highest oxidation state of *Mn* is

(i) +3

(ii) +5

(iii) +6

(iv) +7

(c) Which of the following metal is present in Chlorophyll

(i) Ca

(ii) Mg

(iii) Fe

(iv) Zn

(d) SCN is an example of

(i) Unidentate Ligand

(ii) Polydentate Ligand

(iii) Chelate Ligand

(iv) Ambidentate Ligand

(e) Which metal ion is found in Vitamin B12

(i) Fe (III)

(ii) Co (III)

(iii) Ni (II)

(iv) Zn (II)

2. Answer the following questions : ***(any five)*** 2×5=10

(a) Write the IUPA name of the following complexes : 1+1=2

(i) $[Ptcl(NH_3)_4(No_2)]So_4$

(ii) $K4[Fe(CN)_6]$

(b) What is the difference between double salt and co-ordination compounds ?

(c) Explain why $Ni(CO)_4$ is diamagnetic but tetrahedral.

(d) What is calcination ?

(e) What is the difference between mineral and ore ?

(f) Why do transition metal ions and their complexes show magnetic properties ?

(g) Why does NH_3 readily form complex but NH_4^+ does not ?

3. Answer the following questions : ***(any five)*** 5×5=25

(a) Describe Jahn-Teller effect in Cu^{2+} complexes.

(b) Discuss the catalytical properties of transition elements.

(c) Give the point of difference between elements of 3d series and those of 4d & 5d series.

(d) Explain the factors that affect the crystal field splitting energy (Δ)

(e) How is the colour of the complex compound explained by the C.F.T. ?

(f) Describe Mond process of extracting *Ni.*

(g) Discuss complex formation in the case of transition metals.

(h) What is meant by Latimer diagram ? Explain with an example.

4. Answer the following questions ***(any one)***: 1×10=10

(a) (i) Explain the following terms with an example of each. 2×3=6

(1) Co-ordination number

(2) Oxidation number

(3) Ionisation isomerism

(ii) Write the important postulates of Werner's theory of co-ordination complexes. 4

(b) (i) Discuss magnetic properties of transition elements. 6

(ii) Write the main postulates of valence bond theory. 4
