

(i) Printed Pages : 3

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(ii) Questions : 9

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B.A./B.Sc. (General) 3rd Semester

(2123)

CHEMISTRY

Paper : IX (Inorganic Chemistry-A)

(Same for B.Sc. Microbial & Food Technology)

Time Allowed : Three Hours]

[Maximum Marks : 22

Note :— Attempt **FIVE** questions in all, selecting **ONE** question each from Units I — IV and Question 9 is compulsory

UNIT—I

1. (a) Draw and explain the structure of Copper (II) acetate monohydrate. Account for its low magnetic moment. 2
- (b) Why do transition elements :
 - (i) Give coloured and paramagnetic ions
 - (ii) Exhibit good Catalytic properties ? 2
2. (a) 4s-subshell is filled prior to 3d but on ionisation 4s electrons are removed first. Explain. 2
- (b) Calculate the magnetic moment (spin only) for Mn^{2+} ion. 1
- (c) Zinc forms only Zn^{2+} and not Zn^{3+} ions, why ? 1

UNIT—II

3. (a) Compare second and third transition series with first series in terms of :
(i) Metallic bonding
(ii) Spectrochemical properties. 2
(b) Give the stereochemistry of $[\text{Ag}(\text{CN})_2]^-$ and $[\text{Ag}(\text{SCN})]$. 2
4. (a) Why do Zr and Hf display similar properties. 2
(b) Write electronic configuration of W ($Z = 74$). 1
(c) Draw the structure of $\text{Mo}_2 \text{Cl}_9^{3-}$. 1

UNIT—III

5. (a) Explain giving one example of each kind of the following isomerism :
(i) Co-ordination Isomerism.
(ii) Linkage Isomerism. 2
(b) Write IUPAC names of the following :
(i) $[\text{Pt}(\text{NH}_3)_4][\text{PtCl}_4]$
(ii) $\text{Na}_3[\text{Fe}(\text{C}_2\text{O}_4)_3]$. 2
6. (a) Draw all possible isomers of $[\text{Co}(\text{en})_2\text{Cl}_2]^+$. 2
(b) Calculate EAN of the central atom in :
(i) $[\text{Cr}(\text{NH}_3)_6]^{3+}$ and
(ii) $[\text{Cu}(\text{CN})_4]^{3-}$ and tell which of them obeys EAN rule. 2

UNIT—IV

7. (a) $[\text{Ni}(\text{CN})_4]^{2-}$ is square planar while $[\text{NiCl}_4]^{2-}$ is tetrahedral. Explain on the basis of Valence Bond Theory. 3
- (b) How many unpaired electrons are present in $[\text{Fe}(\text{H}_2\text{O})_6]^{2+}$? 1
8. (a) Account for the different magnetic behaviour of hexacyanoferrate (III) and hexafluoroferrate (III) ions. 3
- (b) Name the Hybridisation in $[\text{Ni}(\text{CN})_4]^{2-}$ ion. 1

(Compulsory Question)

9. (a) Which are the two common oxidation states of Gold? Which of these is unstable to disproportionation?
- (b) Name two elements belonging to group of copper.
- (c) How many Cl^- ions will be precipitated by AgNO_3 solution in $\text{CoCl}_3 \cdot 3\text{NH}_3$ complex.
- (d) Why do tetrahedral complexes not show geometrical isomerism?
- (e) Give one example of an outer orbital complex.
- (f) Which element in the first transition series show highest oxidation state. $1 \times 6 = 6$