(i) Printed Pages : 4 Roll No. .....

(ii) Questions : 9

Sub. Code : 0 2 5 0

Exam. Code : 0 0 0 3

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

(2122)

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, including Question No. **9**, which is compulsory and selecting **ONE** question from each unit.

UNIT—I

1. (a) Discuss the variation of (i) Atomic Radii (ii) Melting and boiling points (iii) Ionisation energies, in the elements of first transition series. 3

   (b) What is use of V_2O_5 ? 1

2. (a) Draw the structure of $[Cr(CH_3COO)_2H_2O]_2$. What is bond multiplicity between the two metal atoms in it ? 2

   (b) Cu^{2+} ions are coloured and paramagnetic while Zn^{2+} ions are colourless and diamagnetic. Explain. 1

(c) Calculate the magnetic moment (Spin only) for Mn^{2+} ion. 1

UNIT—II

3. (a) Compare the second and third transition series with first transition series in terms of :

(i) Spectrochemical properties

(ii) Magnetic behaviour. 2

(b) Draw the structures of (i) Nb_2Cl_{10} (ii) $W_2Cl_9^{3-}$. 2

4. (a) $ZrCl_4$ is more stable chloride of Zirconium while for Palladium, it is $PdCl_2$. Explain. 2

(b) How is the reactivity of Hg different from Zn and Cd ? 2

UNIT—III

5. (a) What do you understand by chelating agent and chelate ? Explain with example. 1

(b) Write the IUAC names of the following :

(i) $[Co(en)_2Cl_2]Cl$

(ii) $K[CrF_4O]$ 2

(c) Define and explain linkage isomerism with examples. 1

6. (a) Explain geometrical isomerism with suitable examples in compounds having co-ordination number 6. 3

(b) Calculate EAN of central atom in the following and tell which of them obey EAN Rule :

(i) $[Ni(CN)_4]^{2-}$

(ii) $[Fe(H_2O)_6]^{2+}$ 1

UNIT—IV

7. (a) Ferricyanide ion and ferrocyanide ion, both are octahedral but show marked differences in their magnetic behaviour. Explain on the basis of VBT. 2

(b) What are the limitations of VBT of transition metal complexes ? 1

(c) Differentiate between inner and outer orbital complexes. 1

8. (a) Explain the geometry and magnetic character of $[Cu(NH_3)_4]^{2+}$ and $[N_1(CO)_4]$ complexes on the basis of VBT. 2

(b) Give important applications of co-ordination complexes in (i) Catalysis (ii) Medical field. 2

UNIT—V

9. (i) Name the metal ions present in Chlorophyll and Vitamin B_{12}.

(ii) Write the formula of Mercury tetraisothiocyanato Cobalt (II).

(iii) What are ambidentate ligands ? Give two examples.

(iv) Write the electronic configuration of Ag(z = 47).

(v) What will happen when acidified $KMnO_4$ is treated with I^- ? Write the Reaction equation.

(vi) Why does Mn(II) ion show maximum paramagnetic character amongst the bivalent ions of first transition series ?

1×6