(i) Printed Pages: 3 Roll No. .....

(ii) Questions : 9 Sub. Code : 0 2 5 0

Exam. Code : 0 0 0 3

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

(1129)

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) Why does Mn(II) show highest paramagnetic behaviour whereas Zn(II) is diamagnetic ?

   (b) Give chemical equations for the reaction of V_2O_5 with NaOH, HCl, Cl_2 and SO_2. 2,2

2. (a) Discuss the variation of atomic radii of first transition series.

   (b) Discuss the aqueous chemistry of Co(II). 2,2

UNIT—II

3. (a) Draw the structure of $Mo_2Cl_8^{4-}$. Discuss the type of bonding involved.

   (b) Why Zr and Hf display similar properties ? 2,2

4. (a) Draw and compare the structures of Re_3Cl_9 and $Re_3Cl_{12}^{3-}$ ion.

   (b) What are isopoly- and heteropoly anions ? Give examples. 2,2

UNIT—III

5. (a) How chelation affects the stability of a complex ?

   (b) What is optical isomerism ? Draw the optical isomers of [Co(EDTA)]- (where EDTA) is ethylenediaminetetraacetic acid. 2,2

6. (a) A coordination compound with the formula $CoCl_3.5NH_3$ precipitates out with silver nitrate solution and shows molar conductance corresponding to three ions. Deduce the structural formula of the compound giving suitable explanation.

   (b) What are ambidentate ligands ? Discuss the iomerism shown by these ligands. 2,2

UNIT—IV

7. (a) Compare the structures of $[Ni(CO)_4]$ and $[Fe(CO_5)]$ on the basis of VBT.

   (b) Give four applications of coordination compounds. 2,2

8. (a) Why $[Mn(CN)_6]^{4-}$ is paramagnetic while $[Fe(CN)_6]^{4-}$ is diamagnetic ? Explain on the basis of VBT.

(b) Give salient features of VBT for explaining bonding in coordination compounds. 2,2

(Compulsory Question)

9. (a) Why Zn^{3+} complexes do not exist ?

(b) What happens when $TiCl_4$ is hydrolyzed ?

(c) What are coinage metals ? Give examples.

(d) Calculate EAN for $[Ag(NH_3)_2]^+$ and $W(CO)_6$.

(e) Write IUPAC names of $Na_3[Fe(C_2O_4)_3]$ and $[Co(NH_3)_5Cl]CO_3$.

(f) Differentiate between a double salt and a coordination compound. 1×6