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

(ii) **Questions : 9** **Sub. Code :** 0 4 5 1

Exam. Code : 0 0 0 5

B.A./B.Sc. (General) 5th Semester

(1129)

CHEMISTRY

(Same for B.Sc. Microbiology and Food Technology)

Paper—XVII : Inorganic Chemistry—A

Time Allowed : Three Hours] **[Maximum Marks : 22**

Note :— Attempt **five** questions in all, selecting at least **one** question from each Unit. Question No. **1** is compulsory.

1. (a) Describe the bonding in $[FeF_6]^{-3}$ in terms of crystal field theory.

   (b) What is the difference between thermodynamic stability and kinetic stability ?

   (c) What is EAN rule ? Do you think $[Co(NH_3)_6]^{+3}$ obeys EAN rule ?

   (d) Give the IUPAC name of the following :

   (i) $K[PtCl_3(C_2H_4)]$

   (ii) $Ni(\pi\text{-}C_5H_5)_2$

   (e) Explain why most of the tetrahedral complexes are high spin complexes.

   (f) What is fractional oxygen saturation in myoglobin function ?

   $1 \times 6 = 6$

UNIT—I

2. (a) Discuss the crystal field splitting of *d*-orbitals in d^3(Td) and d^7(Td). 2

   (b) How does the crystal field theory explain the colour of coordination compounds ? 2

3. Discuss the various factors affecting the magnitude of crystal field splitting, Δ_0. 4

UNIT—II

4. (a) How chelation increases the stability of a complex ? 2

   (b) Derive the relationship between stepwise and overall stability constant. 2

5. (a) Discuss the Polarization Theory of trans effect. 2

   (b) Discuss and show stereochemistry of substitution in the following reaction :

$$[PtCl_4]^{-2} \xrightarrow{NH_3} \xrightarrow{NO_2}$$ 2

UNIT—III

6. (a) Discuss the structure of $Fe_2(CO)_9$. 2

   (b) Complete the reactions :

   (i) $K_2PtCl_4 + C_2H_2 \rightarrow$

   (ii) $Fe(CO)_5 + NaOH \rightarrow$ 2

7. (a) How does an IR spectrum help in explaining bonding and geometries of metal-carbonyl complexes ? 2

   (b) Outline the preparation of organolithium compounds. Draw the structure of methyl lithium tetramer. 2

UNIT—IV

8. Discuss in detail $Na^+ - K^+$ pump in biological systems. 4

9. (a) What do you understand by co-operativity in hemoglobin ? 2

   (b) The reduction of N_2 to NH_3 is thermodynamically favourable (ΔG = –ive). In biological systems, still ATP molecule is required for energy requirement. Comment. 2