(i) Printed Pages: 2 Roll No. .....

(ii) Questions : 9 Sub. Code : 0451

Exam. Code : 0005

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

1128

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 ***one*** question from each Unit. Unit-V is compulsory

UNIT—I

1. (a) Define crystal field stabilization energy. Draw energy level diagram to show the occupancy of orbitals in the following systems and calculate their CFSE :

   (i) d^6 (high spin, octahedral)

   (ii) d^5 (tetrahedral).

   (b) Discuss the factors affecting the magnitude of crystal field splitting, Δ_0. 2,2

2. (a) Discuss the crystal field splitting in octahedral complexes. Give reasons for higher value of crystal field splitting in octahedral than in tetrahedral complexes.

   (b) How does crystal field theory explain the magnetic character of coordination compounds ? 2,2

UNIT—II

3. (a) What is meant by terms : inert and labile complexes ? Show that inertness of a complex is different from its thermodynamic stability.
   (b) What are the chelate complexes ? Give the factors affecting the stability of chelate complex. 2,2
4. (a) Give with examples, different types of substitution reactions in square planar complexes.
   (b) What is log β ? How is it related with the stability of complex ? Explain with example. 2,2

UNIT—III

5. (a) Discuss the bonding in metal-olefin complexes.
   (b) Why do organolithium compounds prefer to oligomerize than exist as single molecule ? 2,2
6. (a) How homogenous hydrogenation of ethylene is carried out by using Wilkinson's catalyst ?
   (b) Explain the term "Effective Atomic Number", with suitable example. How does it define the stability of metal carbonyl complexes ? 2,2

UNIT—IV

7. (a) Name the two oxygen carriers and give their importance in biological systems.
   (b) What are porphyrins ? Draw and explain their structures. 2,2
8. (a) What is meant by Nitrogen Fixation ? What are fundamental requirements of biological nitrogen fixation ?
   (b) What is Bohr effect ? Explain. 3,1

UNIT—V

9. Compulsory Question :
   (a) Give names of two essential trace elements.
   (b) What is hapticity ?
   (c) Give an example of π-acid ligand.
   (d) Define chelate effect.
   (e) What is spectrochemical series ?
   (f) Why are Cuprous compounds colourless ? $1 \times 6 = 6$